



Examining the Adoption of Agricultural Drones Among Pakistani Farmers: A Modified Technology Acceptance Model

Introduction

- Pakistani farmers are slow to adopt agricultural drone technology due to insufficient knowledge, high costs, and environmental issues.
- Technology-based solutions are needed to overcome manual farming practices, which are time-consuming and laborious.
- Previous studies on agricultural drones emphasize their applications and significance in agribusiness.
- This study analyzed factors hindering drone adoption, providing insights for policymakers, researchers, and industry stakeholders to develop targeted interventions.

Objective

- To assess the factors impacting agricultural drone technology adoption

Methodology

- This study used the Modified Technology Acceptance Model (MTAM).
- 130 farmers using drone services were selected using a purposive sampling technique
- The study area for this research was District RYK in Pakistan; the local farmers of this district were the target population.
- Data was collected using the cross-sectional, close-ended survey questionnaire adopted from the previous studies
- Observation to estimate the parameters (N:q) ratio is used for calculating the sample size for SEM 7:1 (7x19 = 133 ≈ 130 proposed by Hair et al. (2019).
- Smart PLS-SEM was used to identify the factors that affect drone adoption, and all items were measured on a 5-point Likert scale.

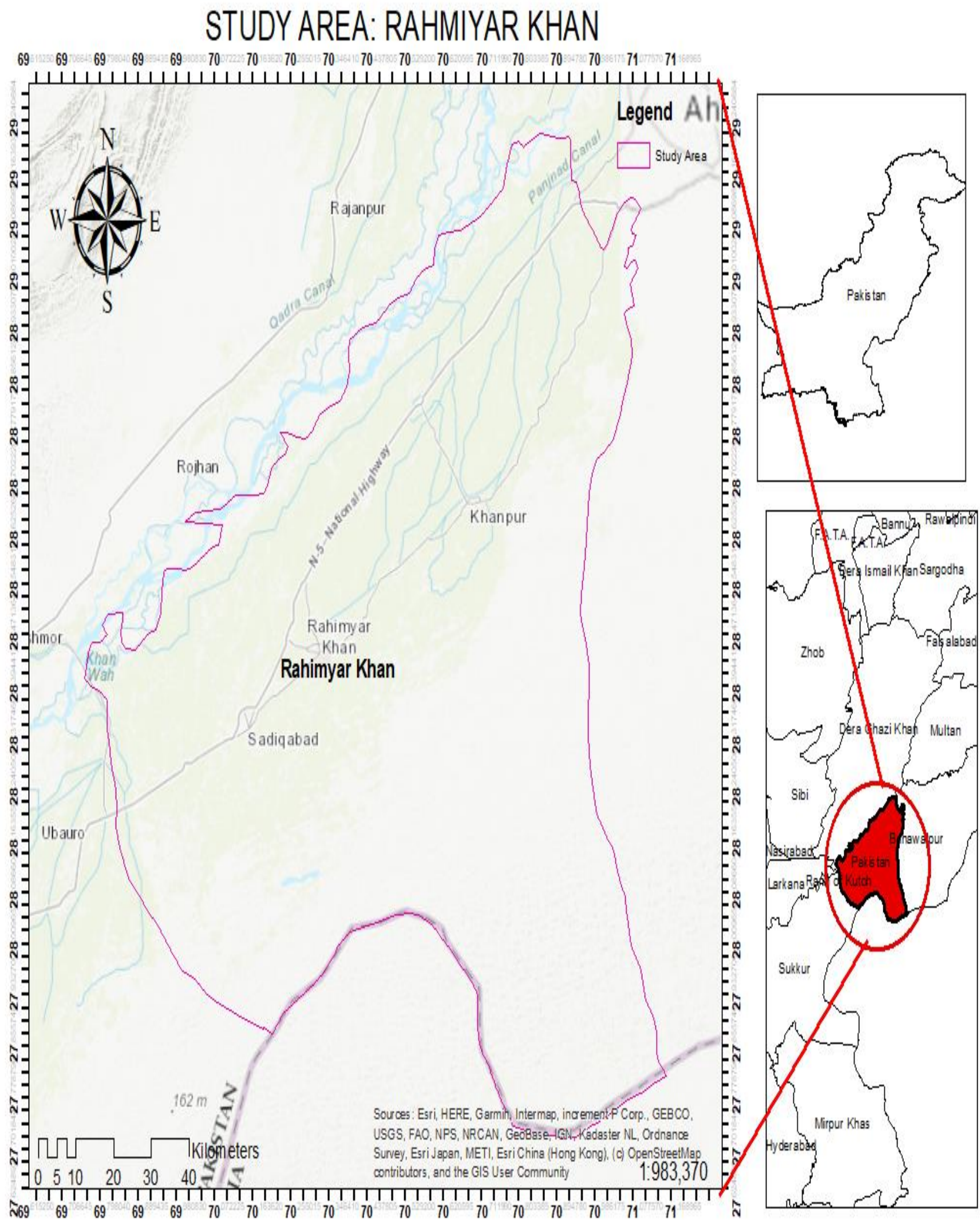


Figure 3. Study Area in Pakistan

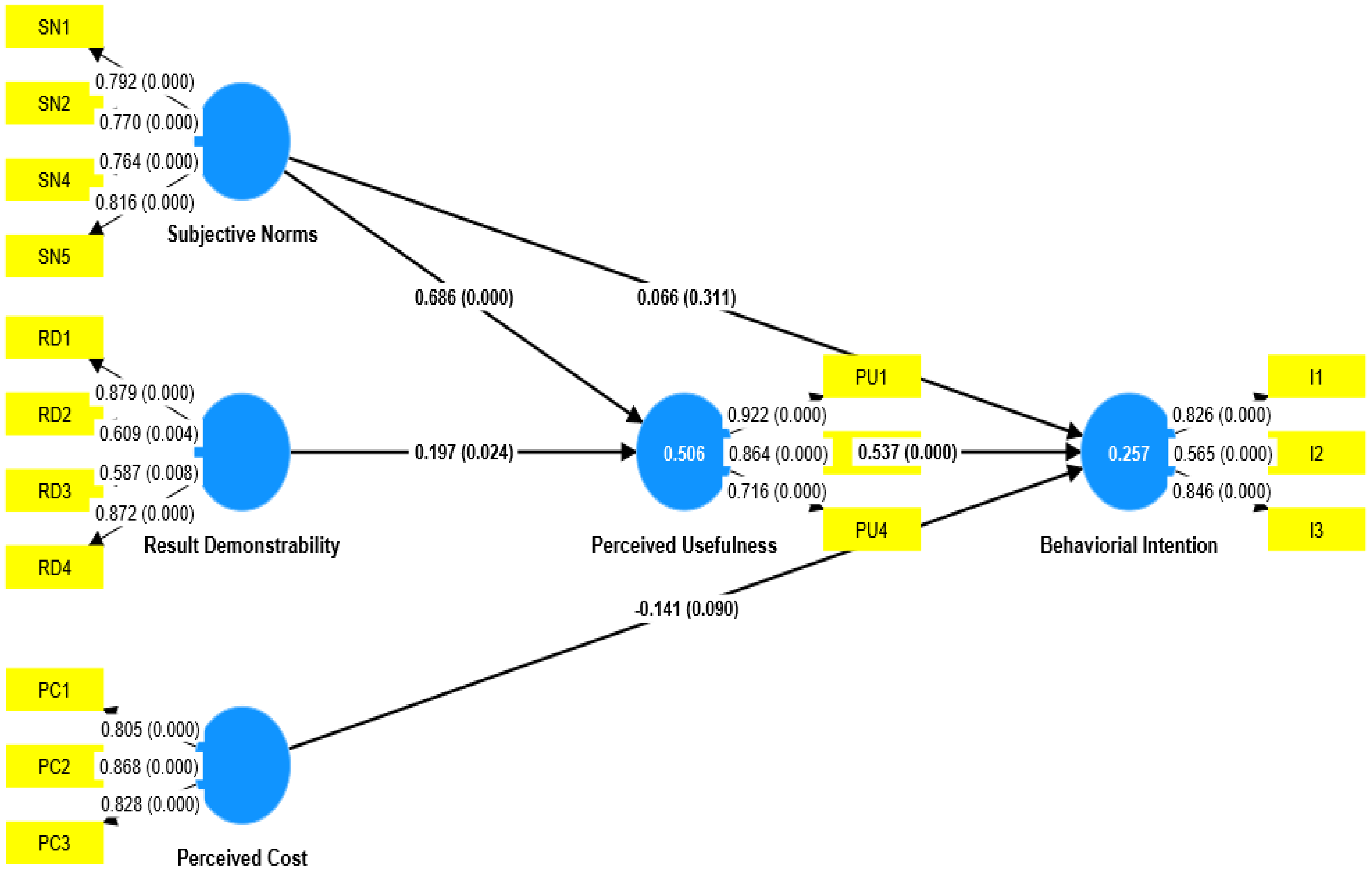
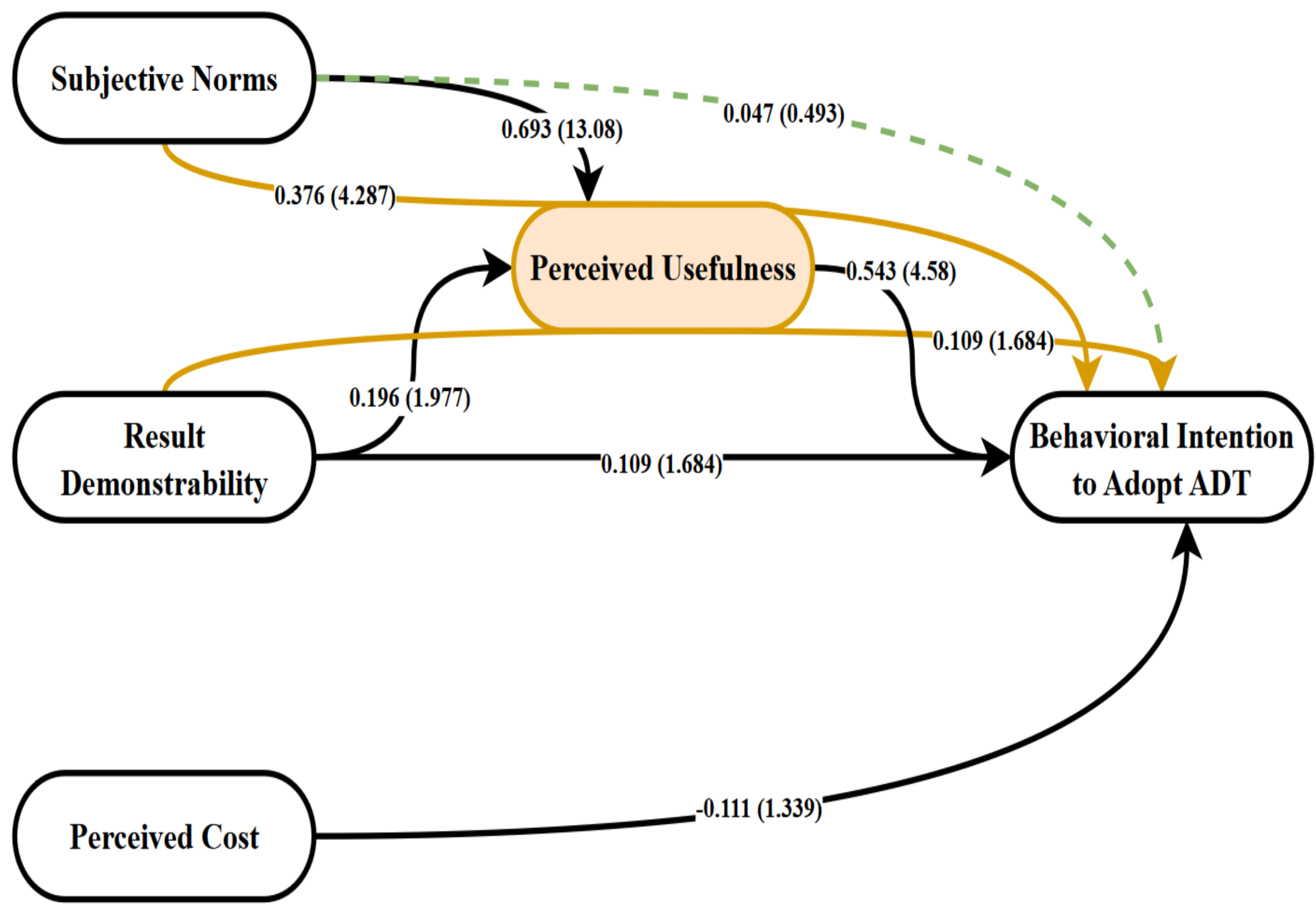


Figure 4. Structural Model

S. No.	Constructs	Number of Items	Scale	References	Nature of Data
Dependent Variable					
1.	Behavioral Intention	3	5 Point Likert	Davis (1989)	Continuous
Independent Variable(s)					
1.	Subjective Norm	5	5 Point Likert	Taylor and Todd (1995)	Continuous
1.	Results Demonstrability	4	5 Point Likert	More and Benbasat (1991)	Continuous
1.	Perceived Cost	3	5 Point Likert	Lee and Kozar (2008)	Continuous
Independent and Mediating Variable					
1.	Perceived Usefulness	4	5 Point Likert	Davis 1989	Continuous

Figure 2. Study Constructs

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Results

- The study found a significant positive effect of RD on BI, with $\beta = 0.109$, indicating that an increase in RD leads to an increase in BI.
- The study found a significant positive effect of PU on BI, with $\beta = 0.543$.
- The study found a significant positive effect of SN on BI, with $\beta = 0.376$.
- The study found a significant negative impact of PC on BI, with $\beta = -0.111$, indicating that a decrease in PC leads to an increase in BI.
- The study found a positive and significant mediation of PU between SN and BI with $\beta = 0.376$.

Conclusion and recommendation

- Drone companies can enhance the subjective norms (SN) of farmers by fostering local influences and encouraging them to utilize their services.
- Drone companies can arrange events like field trials, workshops, or exhibitions to effectively highlight the benefits and outcomes of agricultural drones.
- Farmers perceive agricultural drones as costly. Companies can organize seminars and awareness campaigns to reduce this notion.