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Why do farmers decide to continue? A literature review of the determinants of continuance intention in the agricultural domain

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Abstract

Despite numerous innovations introduced to the agricultural domain to achieve food sufficiency and promote smallholder social-economic growth, limited research has been conducted on the post-adoption stage. This study aims to identify the determining factors of continuance intention in agricultural innovation. A systematic literature review was performed using the PRISMA protocol, with peer-reviewed journal articles published between 2006 and 2024 sourced from Scopus, ScienceDirect, and Google Scholar. Following a rigorous selection process, 21 relevant studies were synthesized. This study classified agricultural innovation into program, technological, and administrative scope, each with unique variables affecting continuance intention. The research identified two primary categories influencing farmers' intention to continue: internal and external variables. Internal aspects comprised personal and cognitive elements. Methodologically, regression analysis was predominantly used to examine personal elements, while both regression and Structural Equation Modelling (SEM) were employed for external factors and cognitive elements. This review demonstrates that the determinants of continuance intention in specific agricultural innovation characteristics is valuable in understanding farmers' decisions. By gaining insights into factors influencing continuance intention, stakeholders can more effectively modify the actionable factors and contribute to the long-term engagement of agricultural innovation despite the inherent complexities in agriculture.

Keywords: agricultural innovation, factors, farmers, post-adoption, systematic review

1 Introduction

The scope of innovation is broad and diverse, depending on the novelty of a plan/program in an organisation, advanced production techniques and technology, or revamped administrative structures (Keupp *et al*, 2012). However, the accurate measure of successful innovation lies not merely in its adoption but in its sustained impact and efficacy over time. As Rogers (1995) highlights in his model of the innovation-decision process, the question of "to continue or discontinue" adoption becomes a critical consideration in the post-adoption phase. In agriculture, innovation is instrumental in optimising the sector's ability to ensure food safety and security, particularly in response to population growth and the need to eliminate hunger, as well as addressing other economic impacts. The overarching goal of agricultural innovation is to create a sustainable and resilient food system (Ogundari & Bolarinwa, 2018; Yoon *et al*., 2021. Furthermore, the continued implementation of agricultural innovation can have a significant impact on communities (Dissanayake *et al*., 2022).

The research on agriculture innovation domain was dense (Doran *et al*., 2020; Kansanga *et al*., 2021; Rizzo *et al*., 2023; Suroso *et al*., 2023; Xia *et al*., 2023; Liu & Liu, 2024); but the existing research predominantly focused on the pre-adoption stage. However, it is clear that the post-adoption stage is also important, as it involves exploring how innovations are used over time and the factors that influence continuance intention. Post-adoption research is equally as important as the pre-adoption research, as it provides insight into user sentiment, the advantages of continued use, and potential areas for improvement (Mishra *et al*., 2023). How-

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ever, despite its importance, the post-adoption phase of agricultural innovation has largely been overlooked in academic studies (Khanal *et al*., 2019). This gap in the literature highlights the need for a comprehensive synthesis of existing research on farmers' experiences and outcomes after adopting agricultural innovations. Therefore, conducting a systematic literature review (SLR) will provide a valuable consolidation of knowledge in this domain.

The concept of continuance in the post-adoption stage provides valuable insights into both the sustained use of innovations and their potential discontinuance (Bhattacherjee, 2001). Although there is a pro-innovation bias favouring the intention to continue using innovations, discontinuance often highlights the negative aspects of innovation rather than its broader societal benefits. It is also important to examine why farmers choose to adopt or abandon innovations, as this provides insights into monitoring the post-adoption phase (Rota *et al*., 2021). This study emphasises continuance intention due to its vital role in amplifying the positive effects of agricultural innovation and in developing long-term policies to sustain these advancements (Yanakittkul & Aungvaravong, 2020).

Drawing on Rogers' (1995) Theory of Innovation and Diffusion (DIT), Davis's (1989) Theory of Acceptance Model/TAM, and Ajzen's (1991) theory of Planned Behaviour/TPB, it becomes evident that the long-term viability of the technology is closely related to its continued use. In digital technology and business, continuance intention is central to survival strategy (Bhattacherjee, 2001). On light of the rapid pace of technological advancement, the concept of continuance intention is highly relevant in domains such as mobile apps, e-learning, online banking, e-commerce, and other online services (Yan *et al*., 2021). In agriculture, continuance intention manifests through terms such as willingness to continue, continued use, persistence behaviour, retention, post-adoption, or even discontinuance. Regardless of these variations in terminology, the core issue remains the same: the importance of continuance intention.

To the best of the authors' knowledge, no SLR work has comprehensively identified the factors influencing the continuance intention toward agricultural innovation. The clarity and rigorous method of the SLR allow future researchers to replicate, validate, or further examine the findings (Shaffril *et al*., 2021). This particular SLR delves into the determinants of continuance intention in the context of agricultural innovation, with the aim to identify the research gaps and propose avenues for future studies. Guided by the PICo framework – Population, Phenomenon of Interest, and Context – this study formulates its research questions based on these key elements (Lockwood *et al*., 2015). In this context, "farmers" constitute the population, "continuance intention post-adoption" is the phenomenon of interest, and "innovation in agriculture" is the context. Thus, the research question is: What are the determining factors of farmers' continuance intention in the agricultural domain? Additionally, this study elucidates relevant models applied to construct the conceptual framework of continuance intention.

2 Materials and methods

2.1 Review protocol, resources, and article selection processes

The ever-growing volume of research can make selecting relevant studies for a comprehensive review a complex task. To address this challenge and ensure a trustworthy, complete, and transparent review process, this study adopted the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (Page *et al*., 2021). PRISMA is adaptable across various disciplines and can be modified to suit specific conditions, with the flow diagram report can be tailored to the study's requirements (Moher *et al*., 2009). For this study, relevant articles were mined from Scopus, ScienceDirect, and Google Scholar. Scopus is a leading database search engine that ranks documents by relevance and citation counts, making it an effective search for in-depth investigation of the topic. ScienceDirect has an extensive bibliographic collection covering a wide range of publication years, while Google Scholar is a friendly user with a simple search string formulation that enables users to perform effective searches using straightforward keywords and phrases (Tober, 2011; Samadzadeh *et al*., 2013; Valente *et al*., 2022). However, Google Scholar requires scrutiny for duplicate entries and indexing inconsistencies due to its broad search mechanism (Halevi *et al*., 2017). Therefore, Google Scholar served as a supplementary database to complement the search conducted through Scopus and ScienceDirect (Gusenbauer & Haddaway, 2020). Following the established SLR protocol, the review process involved three key stages: identification, screening, and eligibility testing (Shaffril *et al*., 2019). The article search was conducted in May 2024, utilising thesaurus entries, dictionaries, and relevant terms from previous research to ensure comprehensive coverage (Table 1).

The identification stage yielded 117 articles from the Scopus, ScienceDirect, and Google Scholar databases. In the second stage, these articles underwent a comprehensive screening, utilising both automated features provided by ScienceDirect and Scopus, as well as manual review techniques. The literature review covered a broad time frame

Table 1: *Search strings used in the selected databases.*

Database	*Search string*
Scopus	TITLE-ABS-KEY ((“farmer*”) AND (“continuance intention” OR “continuous usage” OR “willingness to continue” OR “intention to continue” OR “post-adoption”) AND (“on agriculture” OR “sustainable farming” OR “organic agriculture” OR “green farming” OR “ORF” OR “smart farming” OR “on technology in agriculture” OR “IoT” OR “program*”))
Science Direct	((“farmer”) AND (“continuance intention” OR “willingness to continue” OR “intention to continue” OR “post-adoption”) AND (“sustainable farming” OR “organic agriculture” OR “smart farming” OR “on technology in agriculture”))
Google Scholar	“farmers’ continuance intention”; “farmers’ post adoption”; “farmers’ continuous usage”; “farmers’ willingness to continue”; “farmers intention to continue”

from 2004 to 2024, reflecting the limited research available on the post-adoption behaviour critical to technology diffusion in the agricultural domain (Khanal *et al*., 2019). Only journal articles were included in the study, explicitly excluding conference proceedings, book reviews, and book chapters. This emphasis on peer-reviewed journal articles is to maintain the methodological rigor and quality control associated with the peer-review process. It is also to ensure the reliability, validity, and accuracy of the findings (Steer & Ernst, 2021). To avoid any potential misinterpretations of content and context, only articles published in English were considered. Given that farmers’ post-adoption behaviour was the primary subject of investigation, agriculture was chosen as the domain of study. Based on the criteria detailed in Table 2, 30 articles were excluded as they did not meet the inclusion standards.

Table 2: *Inclusion and exclusion criteria used in the review.*

Criterion	*Inclusion*	*Exclusion*
Document type	Article	Proceeding, book review, article review, book
Subject area	Agriculture	Non-agriculture area
Language	English	Non-English

In the screening stage, 32 duplicate articles were eliminated, leaving 55 articles for eligibility assessment. During this phase, 30 articles were excluded because they either failed to explain the determining factors of post-adoption or did not clearly differentiate between the adoption and post-adoption phases. As a result, 25 articles were subjected to a rigorous quality appraisal, resulting in 21 articles deemed suitable for synthesis in the literature review. Articles not related to the continuance intention of agricultural innovation or those published in non-reputable journals were manually excluded. The flow diagram of the search process is presented in Fig. 1.

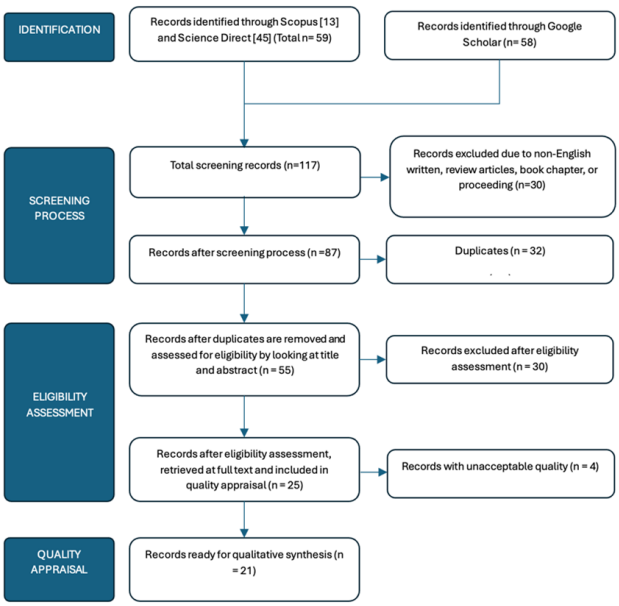

Fig. 1: *Flow diagram of the search process.*

2.2 *Quality assessments*

The last step before identifying relevant articles for analysis involved a quality assessment using the Mixed Methods Appraisal Tool (MMAT) developed by Hong *et al*. (2018). The MMAT is designed to facilitate the evaluation of qualitative, quantitative, and mixed-method research studies by applying a structured set of question-based criteria to guide researchers in assessing whether the sampling method, sample, measurement, bias, and data analysis are adequate to address the research problem. For mixed-method studies, the MMAT assesses how well the qualitative and quantitative components are integrated. In the quality assessment, a total of 21 papers were identified as relevant if they met three out of five MMAT criteria. Interestingly, none of the selected articles employed qualitative methodologies, suggesting that the existing literature predominantly relies on quantitative or mixed-method approaches. Of the selected papers, only two studies used a mixed-method analysis including Kirner *et al*. (2006) and Sahadewo *et al*. (2020).

3 Results

Continuance intention is a concept often associated with information systems. However, it can also be applied in other contexts, provided that certain conditions are met: (1) the

Table 3: *Breakdown of research locations and agricultural innovations in the selected articles.*

No.	*Country*	*Author(s)*	*Count*	*Area of agricultural innovation*
1	Austria	Kirner *et al*., 2006	1	Organic farming
2	Cameroon	Chia *et al*., 2024	1	Tree-growing
3	China	Gai *et al*., 2021; Jia *et al*., 2023; Wu *et al*., 2023	3	Agricultural technology; cooperation with new farmers; crop residue retention
4	Egypt	Rota *et al*., 2021	1	Organic farming
5	Ethiopia	Amsalu & de Graaff, 2007	1	Stone terraces
6	Greece	Karipidis & Tselempis, 2014	1	Quality certification
7	Indonesia	Sahadewo *et al*., 2020; Restianto *et al*., 2021	2	Tobacco farming; organic coconut
8	Iran	Abdollahzadeh *et al*., 2017	1	Biological control
9	Ireland	Fox *et al*., 2021	1	Mobile digital platform
10	Italy	Gatto *et al*., 2019; Pagliacci *et al*., 2020	2	Agri-environmental schemes; climate-smart agriculture
11	Spain	Hernández-Espallardo *et al*., 2013	1	Agricultural cooperatives
12	Switzerland	Mink & Mann, 2022	1	Mountain ruminant farming
13	Tanzania	Kihoma *et al*., 2023	1	Farm recordkeeping
14	Thailand	Srisopaporn *et al*., 2015	1	Good Agricultural Practices (GAP)
15	Turkey	Turker, 2024	1	Youth farm engagement
16	Turkey and Japan	Karahan *et al*., 2023	1	Youth farm engagement
17	Uganda	Mukebezi *et al*., 2023	1	Agribusiness innovation collaboration

context involves an initial decision to adopt or use, (2) the initial use experience influences the context, and (3) there is the potential for the initial decision to be reversed (Gai *et al*., 2021). Although post-adoption research is geographically distributed across several continents, the number of countries contributing studies within the agricultural domain remains relatively limited (Table 3). The three primary areas of interest for agricultural innovation researchers are programs, technology, and administration. Program innovation refers to a novel strategy; technology innovation focuses on a new product or process; and administrative innovation involves new managerial activities that indirectly relate to routine job tasks (Damanpour, 1991). Based on these criteria, articles that explicitly used the term "continuance intention" to describe post-adoption phenomena were synthesised, even if they examined agricultural innovations under information systems (Abdollahzadeh *et al*., 2017; Gai *et al*., 2021; Jia, *et al*., 2023; Pagliacci *et al*., 2020; Restianto *et al*., 2021). Across these studies, the scope centres on agricultural innovation, with most focusing on program innovations (67 %), followed by technological innovations (24 %), and a smaller share addressing administrative or managerial aspects. A common methodological thread is the use of continuance intention frameworks, frequently applied to digital technologies due to the widespread adoption of digital infrastructure (Yan *et al*., 2021).

The Sankey diagram illustrated in Fig. 2 shows the trajectory of factors influencing continuance intention in the context of agricultural innovation. The size and width of each node represent the number of studies focusing on that particular factor (Otto *et al*., 2022). The factors that influenced continuance intention were generally divided into two categories: internal and external. When discussing the agricultural innovation scope (Table 3), most initiatives are found in programs e.g. organic farming (Kirner *et al*., 2006; Restianto *et al*., 2021; Rota *et al*., 2021), climate-smart agricultural practices (Pagliacci *et al*., 2020), and Good Agricultural Practices (Srisopaporn *et al*., 2015). Technology in agriculture works in e.g. stone terraces (Amsalu & de Graaff, 2007), biological control (Abdollahzadeh *et al*., 2017), farm mobile platform (Fox *et al*., 2021), and record keeping (Kihoma *et al*., 2023). Administrative refers to management activities including tobacco and mountain ruminant farming (Sahadewo *et al*., 2020; Mink & Mann, 2022).

Various statistical techniques have been employed to understand the factors influencing continuance intention, including structural equation modelling (SEM), regression analysis, descriptive analysis, and correlation (Fig. 2). A comprehensive review of relevant literature in this study revealed a dominance of regression models employed in this domain (57 %) e.g. Gatto *et al*., (2019); Karahan *et al*., (2023); Mink & Mann, (2022); Pagliacci *et al*., (2020); Sahadewo *et al*., (2020); Turker, (2024), which can be attributed to the intricate and multifaceted nature of the independent variables influencing farmers' decisions. However, the existing studies that utilised regression analysis did not specify the model

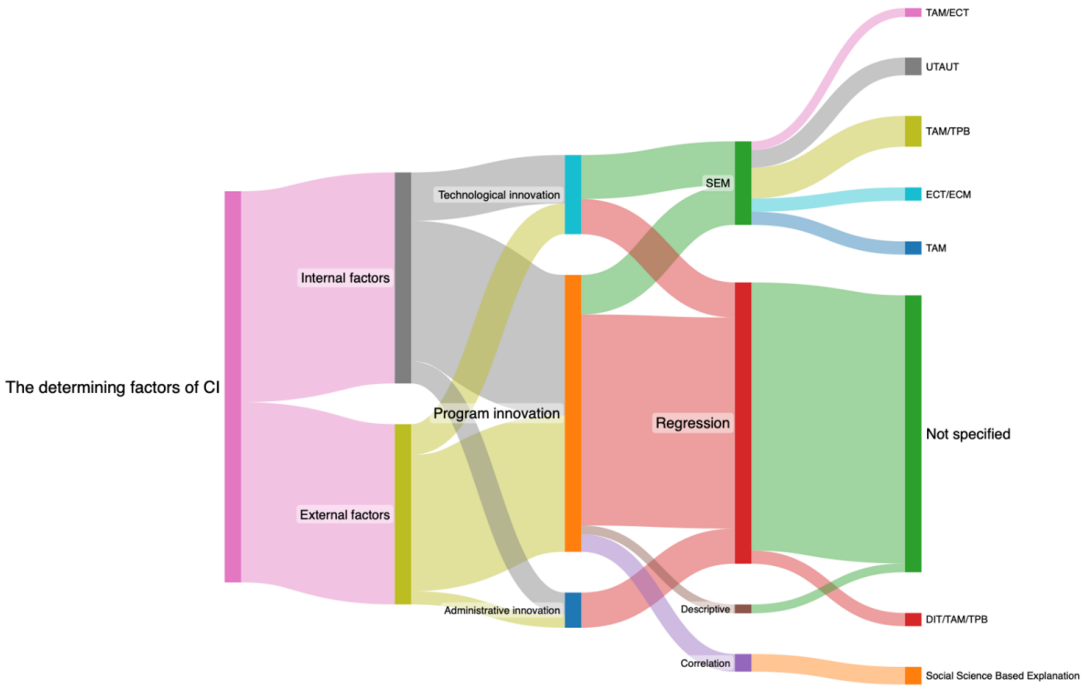

Fig. 2: *Sankey diagram illustrating determining factors of farmers' continuance intention (CI) in various agricultural innovation scopes.*

or theory employed. The components from TAM/TPB were also adopted through the regression analysis in Abdollahzadeh *et al.* (2017).

Several pre-adoption models have been incorporated into post-adoption frameworks through SEM, such as the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Theory of Planned Behaviour (TPB). Extended models were also developed by integrating TAM with continuance intention model including Expectation-Confirmatory Theory (ECT) and Expectation Confirmation Model (ECM), or connecting with other pre-adoption models. However, the prevailing pre-acceptance models of the time, TAM/TPB and UTAUT, faced criticism for their limited explanatory power in post adoption domain, although they were deployed in several studies (e.g. Abdollahzadeh *et al.*, 2017; Fox *et al.*, 2021; Jia *et al.*, 2023). Given these theoretical underpinnings, it becomes evident that combining pre-adoption and post-adoption theories into a unified model is problematic due to the distinct nature of these constructs and their corresponding user behaviours (Bhattacherjee & Barfar, 2011). Furthermore, the insufficient information regarding the model or theory utilised has also resulted in ambiguity concerning the suitability of models and theories in agricultural innovation continuance intention. The selection of appropriate models and variables for investigating continuance intention in agricultural innovation is a crucial step in shaping the research trajectory.

To dive deeper for the contribution of each variable, Fig. 3 illustrates the determinants categorised under program, technology, and administrative innovation. Continuance intention was represented by various terms, e.g. continuance intention, willingness to stay, willingness to maintain, and retaining activity (Fig. 4). Certain determinants appeared across all innovation types, depending on the specific innovation examined. Internal factors were generally not subject to policy intervention; whereas external factors could be addressed through actionable modifications (Fig. 4). The determinants of continuance intention were categorised into internal and external factors. Internal factors were further divided into personal and cognitive components. Personal elements were associated with demographic and farm characteristics, while cognitive elements encompassed psychological constructs such as perception, attitude, willingness to participate, expectation, satisfaction, and trust. Personal elements contributed to the formation of cognitive elements. Profit – appeared with on-farm income – was classified as an external factor due to its dependence on commodity prices. Several external factors could be addressed through policy intervention, whereas others remained unchangeable/beyond policy influence. External influences may affect continuance intention either directly – mostly found in regression model – or indirectly through cognitive elements, while internal factors exerted a direct influence.

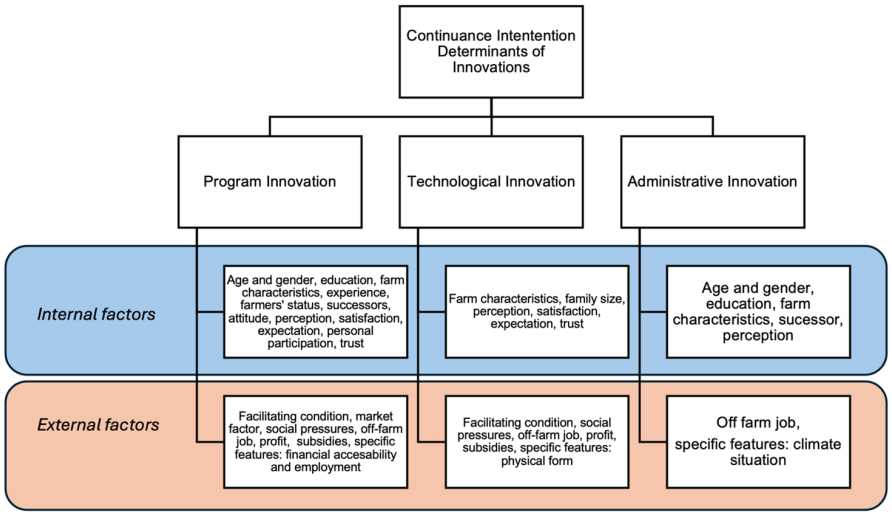

Fig. 3: *Determinants of continuance intention in the agricultural domain.*

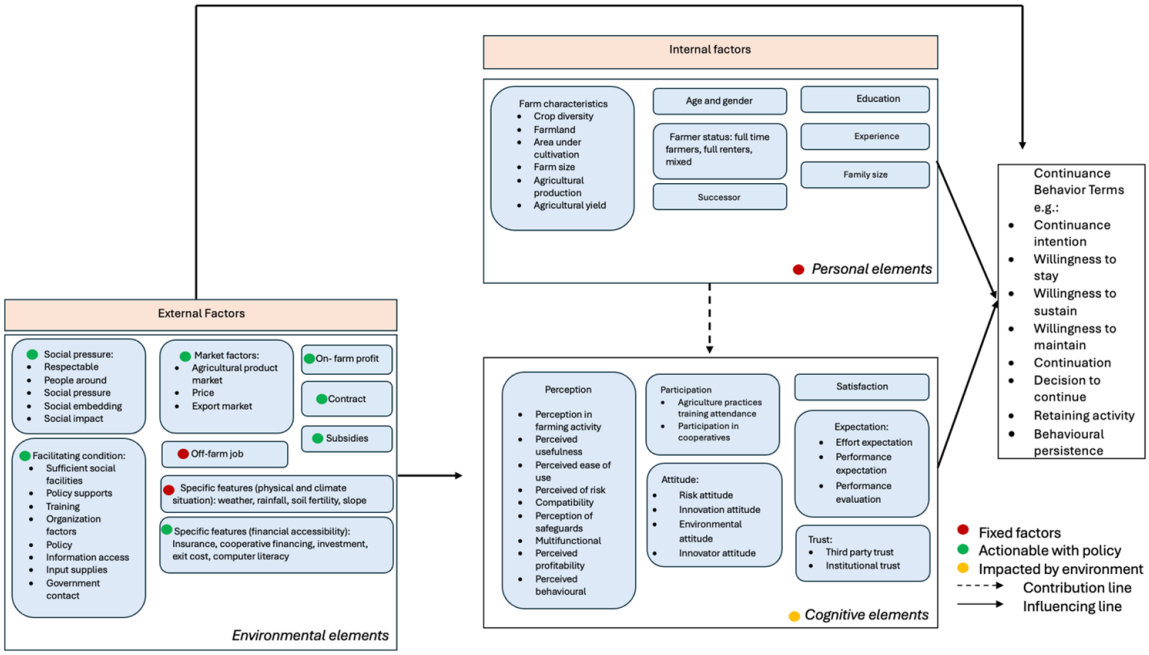

Fig. 4: *Variable forms of farmers' continuance intention (CI) determinants.*

4 Discussion

4.1 Internal factors: Personal and cognitive elements

Internal factors associated with personal and cognitive elements were examined across all areas of innovation, including programs, technology, and administration. Moreover, both groups of internal factors, personal characteristics and cognitive dimensions had the essential connection as well (Fig. 4) (Larnyo *et al.*, 2022; Ng & Hsieh, 2025; Ramzanpour *et al.*, 2025). The factors influencing continuance intention in program innovation appeared to be more intricate compared to those in technological and administrative innovation (Fig. 3). Cognitive elements were present in both programs and technology; however, only perception served as the antecedent in administration. Personal elements may be regarded as fixed, as they cannot be altered or provided by external means while psychological antecedents are triggered by both personal and external factors. They are also the common variables in continuance intention research and often analysed using regression models to show the direct effect toward continuance intention (Fig. 4). Age, gender, education, farm characteristics, experience, and

farmer status (full-time or part-time) were the recurrent variables included in the model. However, they were notably absent from the original Expectation-Confirmation Model (ECM) proposed by Bhattacherjee (2001) since the model focus on cognitive aspect. It is predicted that the rationale behind the deployment of particular factors was associated with the features or characteristics of innovation.

The age variable contribution in post-adoption stage was closely related with the characteristic of the innovation discussed. For example, Mink & Mann (2022) found that older farmers were less likely to continue with livestock farming, primarily due to a lack of direct payments for off-farm activities or a decline in physical strength. Conversely, in organic farming, the primary adopters of organic farming were older farmers due to their economic stability or the urban migration of younger generations with less financial maturity (Rota *et al*., 2021). Gender also emerged as a significant predictor, with women often exhibiting a stronger inclination toward agriculture innovation continuance (Karipidis & Tselempis, 2014; Gatto *et al*, 2019). Additionally, education significantly contributed to program and administrative innovation (Karipidis & Tselempis, 2014; Sahadewo *et al*., 2020) as it is fundamental to farmers' decision-making capabilities and readiness to adopt innovations. In conclusion, while personal elements influence various aspects of innovation, distinct types of innovation necessitate particular demographic characteristics as antecedents. Regarding the innovation types, age, gender, and education played significant roles in program and administrative innovation; however, their involvement in technological cases specifically in agricultural domain might not be essential implying that another personal characteristic might contribute more.

In the next variable, farm characteristics, appeared with various term such as total cultivated area/farmland (Karahan *et al*., 2023), changes in farm ownership (Gatto *et al*., 2019), rice yield (Abdollahzadeh *et al*., 2017), topographical, and soil fertility (Amsalu & de Graaff, 2007). Again, the role played by this variable depended on the characteristics of the innovation (Abdollahzadeh *et al*., 2017; Amsalu & de Graaff, 2007). Additionally, farmers accumulated experience and farmers' status (e.g. full timer or part timer) constituted a pivotal factor in shaping their inclination toward the continuation of program innovations. As farmers engage in social interactions, they disseminate their positive experiences during the adoption time, potentially influencing the broader farming community (Gatto *et al*., 2019; Mukebezi *et al*., 2023). Related to farmers' status, given the inherent demands of active and participatory farming, full-time engagement is often required to effectively implement and benefit from new technologies (Pagliacci *et al*., 2020).

Successors emerged in the domains of program and administrative innovation. Technology is inherently dynamic and personalised, rendering the presence of successors less significant, however family size significantly influence technology in relation to its cost. The presence of a designated successor significantly influenced farmers' continuance intentions in ruminant farming for over a decade (Mink & Mann, 2022). Having a successor may inversely correlate with the continuation of product certification program, suggesting that farmers might defer such decisions to the successor's discretion (Karipidis & Tselempis, 2014). In relation to family size, which was found only in technological innovation, Amsalu & de Graaff (2007) highlighted that larger families – requiring greater sustenance – often led farmers to reduce their investment in high-cost technological innovations due to the financial strain of supporting more household members. Finally, cost and future expectation of the innovation were considered related to the successor's involvement in the future.

Numerous cognitive processes influenced farmers' decisions to keep utilising agricultural innovation. Programs and technologies were more impacted by cognitive factors rather than administrative innovation. A central construct in this domain is attitude, which has been the subject of extensive investigation. Chia *et al*. (2024) posited that farmers' attitudes toward agricultural innovation were shaped by the success stories of their peers and their knowledge base. Mukebezi *et al*. (2023) further elaborated on this by suggesting that attitude mediated the relationship between farmers' personal experience and continuance intention. Meanwhile, Pagliacci (2020), Gatto (2019), and Rota (2021), contend that farmers' motivation and expectations concerning agricultural programs were key drivers of their attitudinal disposition towards continued involvement.

Perception, a variable under the cognitive element, aligned seamlessly with the context of agricultural innovation in all scopes and performed in diverse terms of perception. Researchers have explored various forms of perception, including perceived profitability (Amsalu & de Graaff, 2007), compatibility (Abdollahzadeh *et al*., 2017), perceived safeguard (Hernández-Espallardo *et al*., 2013), perceived risk in organic coconut farming (Restianto *et al*., 2021), and perceived behavioural control (Mukebezi *et al*., 2023). Karahan *et al*. (2023) further introduced the term "multifunctional" (of an innovation) to describe farmers' perceptions of their contributions to solve social and environmental problems. Perceived ease of use and perceived usefulness are the most examined as they reflect farmers' expectations during the pre-adoption stage and have been found to encourage continuance (Abdollahzadeh *et al*., 2017).

Satisfaction, a retrospective measure of experience, plays a pivotal role in models of continuance intention such as ECT and ECM (Bhattacherjee & Barfar, 2011). This determinant emerged specifically in program and technological innovation. Since administrative innovation involves basic job tasks and is inescapable, it is anticipated that satisfaction will not be a desirable variable for investigation. Within the SEM, behavioural factors are integral to the framework, with satisfaction acting as a crucial intermediary between its antecedent and farmers' continuance intention. Farmers evaluate innovation's performance through the lens of satisfaction, ultimately influencing their decision to continue using a technology or participate in a program (Kihoma *et al*., 2023). Indeed, as Bhattacherjee (2001) asserts, satisfaction is an essential determinant in assessing the adoption of innovation, highlighting its role in driving long term engagement when the innovation proves beneficial. Undeniably, few studies have employed this variable, diminishing its otherwise powerful role in evaluating the actual performance of adopted innovations.

Therefore, the "expectations" variable followed satisfaction in both program and technology innovation. The foundational constructs of perceived performance expectancy and effort expectancy, integral to the Unified Theory of Acceptance and Use of Technology (UTAUT) (Yan *et al*., 2021), have evolved into the broader concept of expectation (Fox *et al*., 2021; Hernández-Espallardo *et al*., 2013; Jia *et al*., 2023b). Trust was another antecedent identified specifically in technology and program continuance intention (Gatto *et al*., 2019; Fox *et al*., 2021). To sum, the inclusion of such specific variables indicates that continuance intention is not confined to the traditional variables of earlier models. Instead, it allows for the incorporation of new variables that address the core issues at hand.

4.2 External factors

Policy could significantly modify various external factors (Fig. 4), as it can establish regulations that alter social and economic systems. Social pressures and facilitating conditions were evident in both program and technological innovation contexts; however, they were not observed in administrative innovation. It is expected that the mandatory scheme was closely related to administrative innovation, reducing the social influence and facilitating condition roles. The social system manifests in various ways, including social embedding (Kirner *et al*., 2006), the influence of peers (Rota *et al*., 2021), social impact (Jia *et al*., 2023), and the respect afforded by others (Karahan *et al*., 2023). Studies demonstrated that deeply entrenched social norms can significantly shape individual decisions to adopt and continue agricultural innovations, and it is important to align with community values. Moreover, to promote the adoption and application of agricultural advances, organisations must establish a conducive environment, referred to as "facilitating conditions" in the Unified Theory of Acceptance and Use of Technology (UTAUT) framework (Venkatesh *et al*., 2003).

It is essential to understand organisational support, which refers to the resources and support provided to help the community embrace new programs or technologies, specifically in the area of technology and program innovation under a voluntary scheme. The significant influence of backing from farmers' cooperatives as well as public authorities (Karipidis & Tselempis, 2014), technical assistance (Abdollahzadeh *et al*., 2017), training initiatives (Gatto *et al*., 2019; Turker, 2024), policy support (Jia *et al*., 2023), demonstrated the prominent role of stakeholders. In addition, regular interactions with government entities also help create an environment conducive to the adoption of innovative practices (Srisopaporn *et al*., 2015). Support can also take the form of subsidies, which have been shown to affect continuance intention in program and technological innovation (Karipidis & Tselempis, 2014; Jia, *et al*., 2023; Karahan *et al*., 2023; Turker, 2024). Since it is undoubtedly true that subsidies would have a big impact on continuation intentions, policies related to them need to be developed.

Studies showed that market-oriented innovations, such as improved marketing channels or access to better market information, lead to higher continuance intentions specifically in program innovation (Hernández-Espallardo *et al*., 2013; Rota *et al*., 2021; Wu *et al*., 2023). Market conditions, contracts, and cooperative involvement are recurring themes; however, the specificity of agricultural innovations requires a more profound understanding of their unique determinants, particularly in relation to program innovation. Programs within the agriculture sector typically aim to enhance welfare outcomes. In this context, the government's intervention will be crucial in strengthening the market situation and encouraging farmers to pursue innovation.

Specific features emerged across all contexts of innovation, contingent upon their particular cases. For example, rainfall (Sahadewo *et al*., 2020), burden associated with the innovation (Mink & Mann, 2022), and computer literacy (Karipidis & Tselempis, 2014) had emerged as unique identifiers in their respective contexts. This discovery indicates that incorporating the unique characteristic associated with an innovation as the identifier variable is significant.

While few external factors were identified in administrative innovation, off-farm employment emerged as a contributor across all innovation contexts. Although off-farm job determined continuance intention in a wide context, the re-

lationship between off-farm job and farmers' continuance intention in agricultural innovation is far from straightforward. While one might assume additional income fuels investment in innovation (Karahan *et al*., 2023), Amsalu & de Graaff (2007) found that the short-term benefit of off-farm work was more attractive than focusing on continuing conservation in agriculture. This situation highlighted the need to understand how significant a particular innovation contributed to the adopter's financial decision.

It is clear that the existing research did not identify profit as a determinant in administrative innovation; still the role of profit from agricultural activities related to program and technological innovation is equally perplexing. Sahadewo *et al*. (2020) found that agriculture profit led to adoption but did not affect farmers' decisions to remain the agricultural activities. Pagliacci *et al*. (2020) even found a negative correlation between share income from on-farm activities and the adoption of smart-climate agricultural practices, implying that a lower proportion of income derived from farming may paradoxically encourage persistence in innovative methods. Karipidis & Tselempis, (2014) viewed profit as the proportion of contribution and was found to have a positive effect on continuance intention and it had the same result with Amsalu & de Graaff (2007). However, contrasting findings from Sahadewo *et al*. (2020) indicated that when on-farm income was considered in their model, it revealed no significant impact on continuance intention, suggesting that for farmers who have successfully integrated innovation into their practices, on-farm income was not a primary motivator for further adoption. Although farm's profit has been included as a variable in several models, its influence on continuance intention remains unclear. In sum, both off-farm employment and on-farm profit require more comprehensive and nuanced investigation.

5 Conclusion, implication, and further research direction

The scope of innovation – whether programmatic, technological, or administrative – highlights the distinct characteristics that shape the determinants of continuance intention. Unique or identifying variables emerge within specific innovation contexts, reflecting the inherent features of each innovation type. Moreover, the same variable may play different roles across innovation categories, limiting the generalisability of its influence and underscoring the need for further empirical testing across broader innovation settings. A deeper understanding of innovation characteristics is therefore essential for explaining why particular variables contribute to continuance intention. Although evaluator variables such as satisfaction are theoretically central to post-adoption behaviour, their application within agricultural post-adoption research has received limited scholarly attention.

This review also reinforces the practical importance of post-adoption analysis in agriculture. Such analysis can support stakeholders in taking decisive action not only to attract new adopters but also to retain existing ones. Stakeholder contributions to policy development are particularly relevant for external components such as social system transformation, facilitating conditions, and subsidy provision. At the same time, adopters' fixed characteristics must be considered when designing strategies to sustain innovation use. Nevertheless, this review has limitations. It does not provide a comprehensive comparison of theories and models across the selected studies. Future research should therefore critically examine the models employed, compare their robustness, identify the most effective predictors, and consider the influence of different data types. Comparative analyses of factors influencing pre-adoption and post-adoption stages within specific agricultural innovations would also be valuable.

The absence of purely qualitative research in the reviewed literature represents a missed opportunity. Qualitative investigations into continuance intention could yield deeper insights and enrich theoretical understanding. Bridging quantitative, qualitative, and mixed-method approaches would strengthen knowledge of post-adoption behaviour. Additionally, expanding the search to include a wider range of databases would also broaden the evidence base and enhance the generalisability of findings (Gusenbauer & Haddaway, 2020).

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Conflict of interest

The authors declare no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

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