

Exploring the Barriers and Readiness Factors for Agricultural Extension in Thailand

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Individual behaviors and external factors have gained greater attention in recent decades with the adoption of new technologies and practices. In this regard a new term was introduced named agriculture extension. The current study attempted to explore the influence of the contributors and hinderances to agriculture extension. The data was collected from students using the convenience sampling. Smart-PLS was used to analyze the data collected. The results of the study revealed that lessened individual and policy barriers, a sense of personal readiness and finally entrepreneurial self-efficacy have significant positive influence on agriculture extension. Furthermore, the study also showed the positive mediation role of agriculture entrepreneurship between all independent and dependent variables. The results of the study are significant and all hypotheses are accepted. The contribution of the study and suggested future directions are provided at the end of the research paper.

Key words: *Self-efficacy, entrepreneurship, intrapreneurship, extension, adoption.*

Introduction

Agriculture continues to be a significant factor to reduce poverty and manage sustainability in the 21st century. This is a reality especially in developing countries such as Thailand (Agbarevo, 2013; Ruane & Sonnino, 2011). It also continues to be the primary source of food which simultaneously provides the raw materials to other industries also, contributing to the economy and providing a means of livelihood to individuals (Jermsittiparsert, Sriyakul, & Rodoosong, 2013). Its growth can potentially enhance effectiveness and efficiency, increase

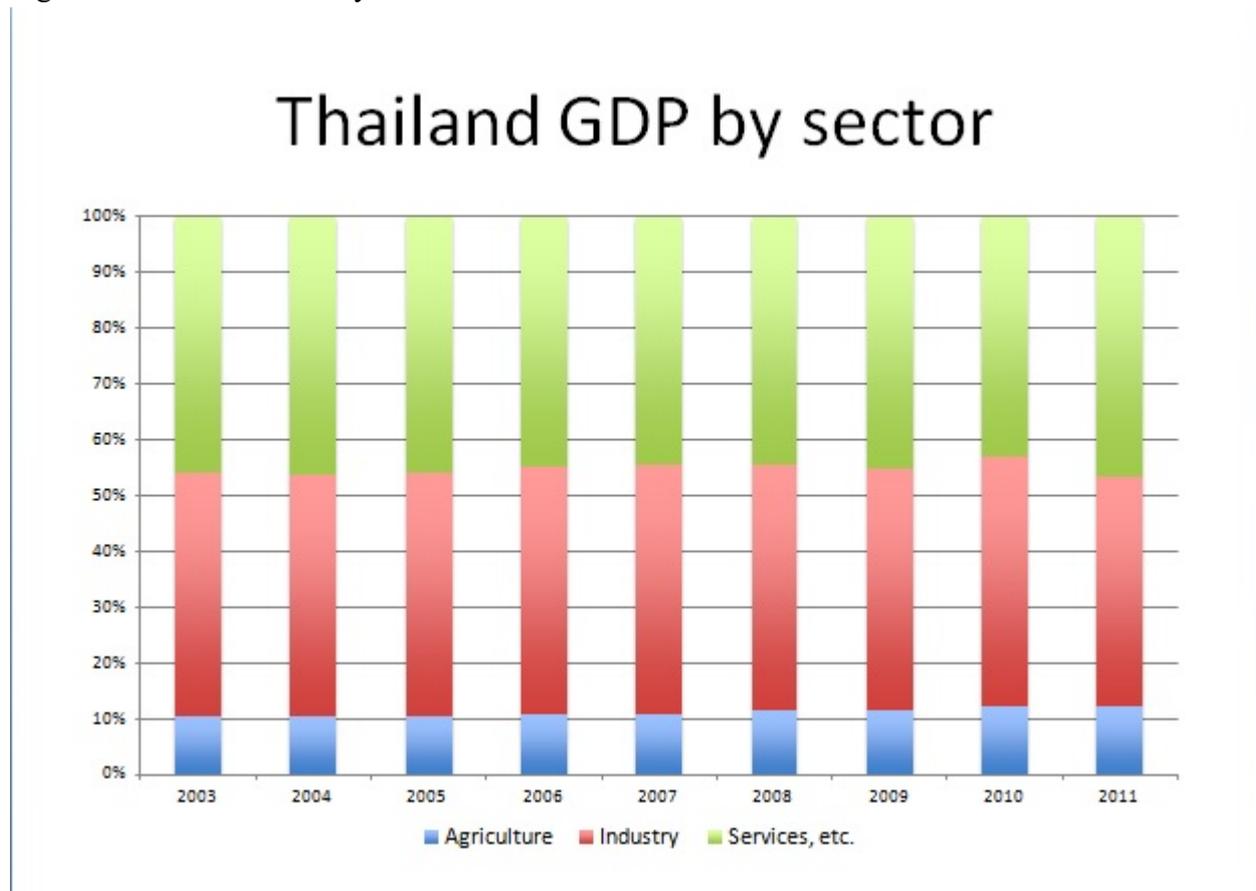
farmer income and serves as a stimulus for agricultural and non-agricultural poverty alleviation (Ruane & Sonnino, 2011; Timmer, 2005). Previously statistics have indicated that approximately 2.5 billion people in developing countries are directly dependent on and affected by agriculture. Thus it is an important sector which should be addressed. Moreover it has also been argued that the major proportion of the total population consists of the farmers in developing countries and their needs in health and educational in particular need to be in line with the income they make from agriculture (Timmer, 2005). With the dynamic environment and rapid advancements in the industrial sectors it has become a need to develop the agriculture sector accordingly. In this regard, the term of agriculture extension is available which explains the mechanisms (Baloch & Thapa, 2017). The above presented statistics and arguments establish that agriculture is an important sector in the economy of a developing country so there is a need to pay attention to it as a potential tool for poverty alleviation.

Over the years, numerous development have been made in Thailand which have led to its status as an emerging country. However the agriculture of Thailand has not observed such devoted development efforts as compared to other sectors of Thailand. In this regard previous studies (Traimongkolkul & Tanpichai, 2005; Uan-sakul, 2000) have identified that before and after the 1997 Thailand crisis, no significant or viable changes happened in the lives of poor farmers and nothing has been mentioned in terms of the development of environmental sustainability. More recently a study has argued that over the past 35 years the government has formulated seven national development plans. However the income gap between the agriculture and non-agriculture sectors has expanded from the ratio of 1:6 instead of shrinking, to 1:13 (Rangsipaht, Saengchan, & Parnuwad, 2013).

There are several factors which account for this gap but it predominantly highlights the negligence of small farmers and further, their resilience. Thus this warrants more research in regarding the steps and policies which could potentially overcome such a scenario. Personal initiatives, creativity and perceptions towards the work stimulates entrepreneurial behaviors among individuals which leads to improved performance and goal accomplishment (Hashemi & Nadi, 2012). Furthermore, agriculture extension is limited by various factors such as government policies etc. When an individual is ready to adopt new technologies he or she is hindered by external factors beyond their control which can potentially hinder the agriculture extension in any country or economy. Hashemi and Nadi (2012), argued that entrepreneurship is a significant factor for economic and social development and it is a widely discussed and recognized topic. A general observation is that low organizational productivity has challenged the organizations for years especially in developing countries and that the agriculture sector has been challenged by lack of creativity and personal initiatives. Thus this has dampened the overall application of agriculture extension. Effective measures to support entrepreneurship should be made to improve overall agriculture performance.

Considering this, the present study investigates two opposite in agricultural extension, both the boosters and barriers for agricultural extensions in Thailand. Agriculture extensions serve as a potential tool which can uplift poor farmers. With this aim the study will explore the factors that boost or hinder the application of agriculture extension in Thailand. The study is significant for policy makers as it will forewarn them of the policy level hurdles which hinder the way of agriculture extension application.

Figure 1: Thailand GDP by sector



Source:Olmo (2018)

Figure 1 above shows that there is still need to grow the agriculture sector of Thailand as compare to sectors such as the industrial and service sectors. Agriculture sector development is vital for developing the overall economy and the Thai industrial sector is much more developed than the agriculture sector.

Literature Review

Agricultural extension

Agricultural extension has been defined as the informal education procedures offered to an individual living in rural areas involving the transformation of information, skills and value to accomplish goals at three levels: personal, social and national (KrishiWorld, 2012). The previous concept of extension has been merged with agriculture to develop a new concept which is agriculture extension.

Agriculture extension has been defined in different ways; some of the definitions for agriculture extension are as follows: Agricultural extension has been defined as “a non-formal learning process that integrates services for target groups who are agriculturists and their families through self-reliance approaches to achieve the wellbeing of the community”(Rangsipaht et al., 2013). It has also been defined as a service or system which helps the people working in farms through academic procedures for the improved methods of farming and methods, enhances their production effectiveness and efficiency and uplifts their livelihood, social status and overall agriculture (Maunder, 1973). These services aim to improve overall agriculture production through skill development and improved life standards for farmers and their dependents achieved with increased profitability of farming activities (Mahaliyanaarachchi & Bandara, 2006).

Agriculture extension acts as a major factor to advance the agriculture by providing the necessary support to help individuals engaged in agriculture to resolve problems and to gain information, developing competencies and application of latest technologies for improved life standards and well-being. This can be done via a private agency or can be controlled and observed by the government (Anaeto et al., 2012) and also serves as a primary driver to employ the latest technologies and farming practices in agriculture which ultimately leads to improved farmer well-being.

Intrapreneurship and agriculture extension

Entrepreneurship is directly associated with the creativity and adoption of new ways to do the things. In this regard, agricultural extension is also necessary for farmers to be creative, they must have to think outside the box, they need to redefine their vision and generate new ideas. The concept of intrapreneurship was introduced in 1976 and is relatively new. It has been characterized by an aim to improve the organization performance, enhancing the choices for the success in the presence of challenging competition. It is a narrow term as compared to entrepreneurship (Åmo & Kolvereid, 2005).

It is necessary to note the difference between intrapreneurship and entrepreneurship. The personal with intrapreneurship ability tends to take risks and risky decisions while being dependent on organizational resources. Whereas entrepreneurs use their own resources in this regard (Morris, Kuratko, & Covin, 2008). Intrapreneurship happens among employees within the same organization whereas entrepreneurship happens outside the organization and is primarily dependent on the resources of the person (Åmo & Kolvereid, 2005). Importantly, entrepreneurs develop the tacit knowledge in any new organization rather than employing the already existing processes and procedures from other organizations. Intrapreneurs tend to work within organizations which already have developed policies, languages and working environment etc. (Honig, 2001).

Having differentiated intrapreneurship from entrepreneurship it is obvious that the intrapreneur depends upon existing organizational resources to innovate. To achieve intrapreneurship, different steps and processes linked with the creation of a new business must be integrated into the overall portfolio and systems of an organization. In an agricultural context intrapreneurship is broadly defined as similar to entrepreneurship regardless of the farmer's scale of operations, and motivates them to take risks and make decisions for their own well-being (Narayanan, Yang, & Zahra, 2009). Generally speaking it defines developing new business ideas and choices within an established large scale organization. It is mostly referred to as the organizational actions or processes where an enterprise acts in an innovative and creative way, taking risks for improved performance.

Intrapreneurship results in a number of positive outcomes for organizations, products and services and new ways of dealing with the customers etc., and is applicable in the domain of agriculture extension. When a farmer thinks beyond the box and adopts new practices, it leads him or her towards more effective farming as compared to traditional methods (Karimi, Malekmohamadi, Ahmadpour Daryani, & Rezvanfar, 2011). Thus based on the above mentioned arguments it can be stated that individual intrapreneurship can lead to the application of new ideas as is the case with agriculture extension. When a farmer has the courage to take risks and go against the odds they can easily choose agriculture extension. Thus it is argued that the intrapreneurship of a farmer can assist in the application of agriculture extension which will improve the overall agriculture and livelihood of farmers in Thailand. It is hypothesized that:

H1: Intrapreneurship significantly influences agriculture extension.

Readiness for agriculture extension agriculture intrapreneurship and agriculture extension

There are several factors which do influence the intrapreneurship of an individual which makes it a function of the individual, motivational and situational factors. Bearing in mind this factor of readiness for agriculture extension has been measured by two parameters: entrepreneurial self-efficacy and personal readiness of a farmer. Self-efficacy is derived from social learning theory and it is the key factor which elaborates the behaviors via mutual relationships which exist between the personal characteristics, environment and behavioral aspects (Chen et al., 1998; Hartsfield, 2003). Based on the core concept of self-efficacy a new concept was derived, “entrepreneurial self-efficacy” which denotes the strength of an individual’s faith that he or she is able to productively perform the different characteristics and responsibilities of being an entrepreneur.

It is inclusive of five factors: marketing, innovation, management, risk-taking, and financial control (Chen et al., 1998). From the core concept of self-efficacy and its impact on behaviour, the same is applied to agricultural entrepreneurial self-efficacy. It is argued that self-efficacy is the individual’s belief regarding his or her capability to execute entrepreneurship related to organizational tasks. Thus it can be argued that intrapreneurship is related to risk taking, creativity, innovativeness and pro-activeness in the agricultural domain. Previously the impact of the self-efficacy has been identified on performance (Judge & Bono, 2001) and empirical evidence is available which states that entrepreneurial self-efficacy positively influences entrepreneurial behavior (Wakkee, Elfring, & Monaghan, 2010). Similarly, Hashemi and Nadi (2012), conducted a study by collecting data from 80 agricultural personnel. They reported that entrepreneurial self-efficacy significantly influences behaviors towards intrapreneurship. Entrepreneurial self-efficacy is composed of the deliberate tasks and intent to develop and innovate new ventures. Thus based on the above mentioned arguments it is argued that the intrapreneurship self-efficacy can potentially lead to agriculture extension.

Personal readiness is the other parameter used to evaluate the intrapreneurship self-efficacy of an individual. Personal readiness covers broad domain of motivation of a farmer to engage with agriculture extension. It includes the farmer’s knowledge about the application and adoption of new technologies and farming techniques for t agriculture extension and to what extent a farmer believes that it is the right time to engage with agriculture extension and the availability of reading material which can address farmer needs (Purnomo & Lee, 2010). Personal readiness of a farmer stimulates his or her intrapreneurship behavior which further leads to agriculture extension. By definition agriculture extension is the behavior in which new tools and technologies are used to improve agricultural practices. Thus it can be argued

that the boosters stimulate intrapreneurship behavior which thus translates into agriculture extension. Therefore it is hypothesized that:

H2: *Entrepreneurial self-efficacy is significantly associated with agriculture extension.*

H2a: *Agriculture intrapreneurship is a significant mediator in the relationship between relationship entrepreneurial self-efficacy and agriculture extension.*

H3: *Personal readiness is significantly associated with agriculture extension.*

H3a: *Agriculture intrapreneurship is a significant mediator in the relationship between personal readiness and agriculture extension.*

Barriers for agriculture extension, agriculture intrapreneurship and agriculture extension

Further to the boosters of agriculture extension, the barriers have also been considered in this research study. Personal and policy level barriers are considered which can potentially hinder the agriculture extension. Government policies do influence a farmer's choice in every aspect. In this regard a recent study has argued that government policies directly influence the quality and production of rice. The adoption of technologies and knowledge transfer to the farmers is significantly influenced by government policies. When the government intervenes in the market by issuing new policies, it can lead to disruption in farmers' work (Laiprakobsup, 2019; Ngongo, 2016).

Stable and consistent government or state policies lend confidence to farmers by reducing the market uncertainty. Whereas shaky government policies serve as a potential barrier to agricultural extension (Karimi et al., 2011; Maresch, Harms, Kailer, & Wimmer-Wurm, 2016). Furthermore, these policies also cover special taxes, campaigns for agriculture extension, legal support and legislation etc. Uncertain policies shake the confidence of farmers and hinder agricultural extension. Whereas positive policies which assist farmers, boost confidence and ultimately lead to agriculture extension. Similarly individual level barriers such as lack of confidence in the latest available agriculture techniques e.g. drip irrigation diminish agricultural extension. When farmers have low faith in new agriculture techniques they tend to doubt them and have less confidence to use those techniques (Bae, Qian, Miao, & Fiet, 2014; Gawel & Pietrzykowski, 2015; Purnomo & Lee, 2010). Furthermore, any kind of language barrier which shakes the confidence of farmers as they are unable to understand the techniques fully, may dampen confidence which can possibly reduce intrapreneurship intentions, risk taking and creativity etc. Therefore it is concluded that individuals with personal barriers may tend to be less oriented towards intrapreneurship resulting in lower tendency to agriculture extension and vice versa. Thus it is hypothesized that:

H4: *Individual barriers are significantly associated with agriculture extension.*

H4a: Agriculture intrapreneurship is a significant mediator in the relationship between individual barriers and agriculture extension.

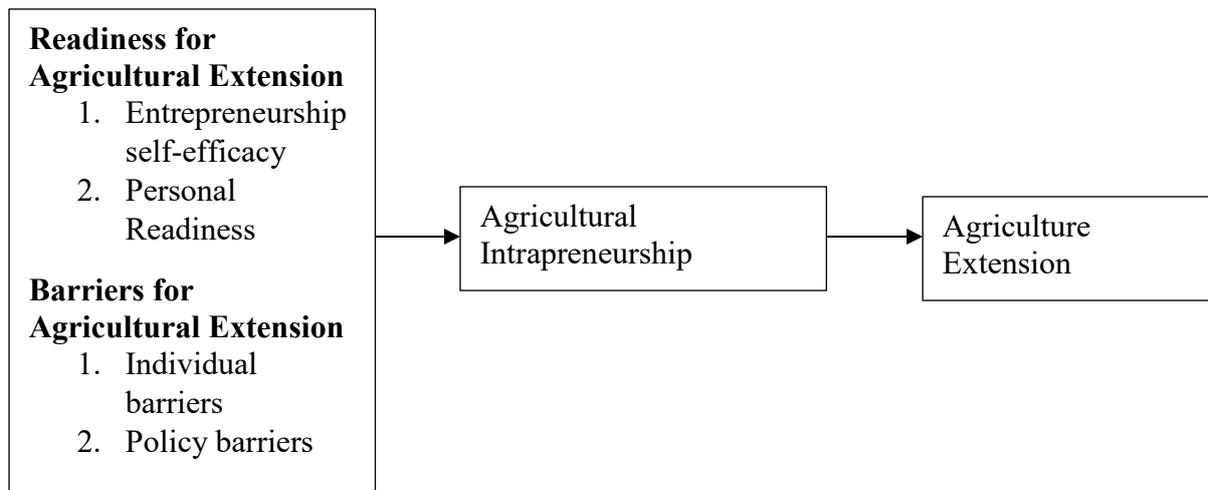
H5: Policy barriers are significantly associated with agriculture extension.

H5a: Agriculture intrapreneurship is a significant mediator in the relationship between policy barriers and agriculture extension.

Research Framework

The study has a primary objective to explore how different factors serve as a potential booster or barrier for the agricultural extension. The following is the research framework of the present study. Entrepreneurial self-efficacy and personal readiness have been considered as potential boosters for agricultural entrepreneurship which lead to agricultural extension. Whereas individual and policy barriers have been considered as potential hurdles for agricultural intrapreneurship which ultimately blocks agricultural extension as depicted in Figure 2 below.

Figure 2. Research Framework



Methodology

Recent advances in agriculture have boosted the research in this field. The significance of agriculture innovation is a focus of the present study which has attempted to explore the relationship between boosters and hurdles to agriculture extension. Furthermore, the present study has also considered the role of agriculture intrapreneurship as a potential mediator.

The nature of the study is quantitative and descriptive in nature. For data collection the first step was to select the appropriate population and for this study, the population is students of the top ranked universities in Thailand, which comes under the top 100. This choice was

made as these universities are top ranked because of their research and output. Secondly, the students are taught entrepreneurship and agriculture related programs there as well.

The sample size estimation became a crucial point to ensure a true representation of the population. For sample size selection researchers have proposed different parameters and methods and according to Barlett, Kotrlik, and Higgins (2001), the sample size should be 20% of the population. G power is also used to determine the sample size where the sample size should fall between 200 to 400 (Oke, Ogunsami, & Ogunlana, 2012). The comprehensive view of all above mentioned techniques of sample size suggests that in this study, it should be between 200 and 400 respondents. However, the present study opted for the Krejcie and Morgan (1970), table for sample size and according to this, the ideal size is 332 respondents as the population of the study is 1950 students. The students are selected regardless of their current semester of study.

Convenience sampling was used to gather data from the students who are studying in the selected universities. As the population shared characteristics this served as a potential reason to adopt convenience sampling. The study is quantitative in nature so the data was collected from the respondents by using a self-administered questionnaire. Initially the purpose of study and procedure of data collection was conveyed to the Dean of schools in a meeting. After gaining permission, data was collected within a timeframe of 1 month. There were two sections to the questionnaire. One of them dealt with personal information such as age, education, course and current semester while the latter one dealt with the questions related to the variables under study. Following are the details of the questionnaires adapted from previous studies. Entrepreneurial self-efficacy was measured by a 6 item scale (Hashemi & Nadi, 2012), personal readiness was measured by a 5 item scale (So & Swatman, 2006), individual barriers were measured by a 6 item scale (Mungania, 2003) and policy barriers were measured by a 4 item scale (Soekartawi, 2005). Mediating variable, agriculture intrapreneurship, was measured by a 5 item scale (Hashemi & Nadi, 2012) and finally the dependent variable, agriculture extension was measured by adopting a 6 item scale (Karimi et al., 2011).

For data analysis Smart-PLS was used. The following are details of the study results and their interpretation.

Results

Table 1: Confirmatory Factor Analysis

Constructs	Items	Loadings	Alpha	CR	AVE
Agriculture Extension	AE1	0.749	0.695	0.814	0.522
	AE3	0.739			
	AE4	0.694			
	AE5	0.707			
Agriculture Intrapreneurship	AI1	0.705	0.695	0.813	0.521
	AI2	0.759			
	AI4	0.714			
	AI5	0.708			
Entrepreneurial Self-Efficacy	ESE1	0.796	0.664	0.816	0.596
	ESE2	0.777			
	ESE3	0.742			
Individual Barriers	IB1	0.741	0.728	0.828	0.547
	IB2	0.777			
	IB5	0.722			
	IB6	0.717			
Policy Barriers	PB2	0.731	0.577	0.780	0.541
	PB3	0.711			
	PB4	0.764			
Personal Readiness	PR1	0.845	0.576	0.751	0.507
	PR2	0.640			
	PR3	0.629			

Table 1 above shows results of the confirmatory factor analysis. It was conducted to validate the questionnaire used in the study. There are three parameters for the convergent validity: factor loading, composite reliability and average variance were extracted. The values for the factor loadings should be greater than 0.7 (Hair et al., 2010). It is obvious from the table above that the values for the factor loadings of all items satisfy the criteria. The items with low factor loadings were deleted.

Moreover the values for the composite reliability should be greater than 0.8 and 0.5 which in combination with the factor loadings establishes the convergent validity. As per the table above CR for agriculture extension, agriculture intrapreneurship, entrepreneurial self-efficacy, individual barriers, policy barriers and personal readiness is valued at 0.814, 0.813, 0.816, 0.828, 0.780, and 0.751 respectively. Whereas values for AVE for variables: agriculture extension, agriculture intrapreneurship, entrepreneurial self-efficacy, individual

barriers, policy barriers and personal readiness is valued at 0.522, 0.521, 0.596, 0.547, 0.541, and 0.507 respectively. Thus all the criteria for convergent validity have been satisfied which establishes it and signals ability to proceed with further tests. Figure 3 below shows the CFA model values for the present study research framework. All the values for the factor loadings are presented in Figure 3 with their respective variable:

Figure 3. Discriminant Validity

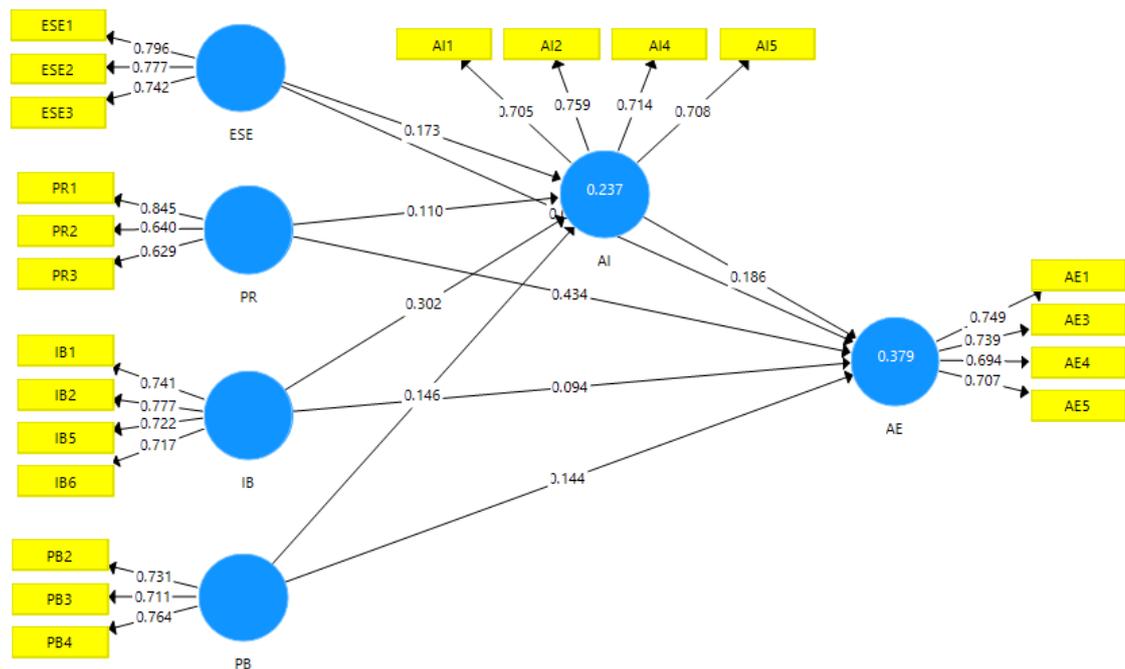


Table 2: Fornell & Larcker

	AE	AI	ESE	IB	PB	PR
AE	0.723					
AI	0.371	0.722				
ESE	0.175	0.296	0.772			
IB	0.312	0.395	0.225	0.739		
PB	0.311	0.275	0.31	0.168	0.736	
PR	0.536	0.237	0.083	0.267	0.218	0.712

Discriminant validity has been measured by using the “Fornell & Larcker Criterion” technique. According to which the correlation with the variable must be greater than all other

variables in the table. All the correlations in Table 2 above are less than the variable itself which affirms the discriminant validity.

Table 3

	AE	AI	ESE	IB	PB	PR
AE						
AI	0.527					
ESE	0.254	0.429				
IB	0.424	0.54	0.328			
PB	0.492	0.433	0.496	0.256		
PR	0.723	0.353	0.153	0.384	0.336	

The latest technique for discriminant validity is known as “Hetrotrait-Monotrait Correlation Ratio” (HTMT). According to this technique the values for all the correlations should be less than 0.85 as shown in Table 3 above where all the values lie within range which asserts the discriminant validity. Thus Tables 1 to 3 present all required figures, allowing progress with further tests as the scale is valid.

Structural Equation Modelling

Table 4:

Relationships	Beta	SD	t value	p value
AI -> AE	0.186	0.047	3.933	p<0.05
ESE -> AE	0.017	0.044	0.398	0.345
ESE -> AI	0.173	0.048	3.587	p<0.05
IB -> AE	0.094	0.041	2.307	p<0.05
IB -> AI	0.302	0.048	6.223	p<0.05
PB -> AE	0.144	0.051	2.85	p<0.05
PB -> AI	0.146	0.048	3.054	p<0.05
PR -> AE	0.434	0.052	8.422	p<0.05
PR -> AI	0.11	0.049	2.245	p<0.05

After the parameters of the validity SEM was applied. As per Table 4 above there are some hypotheses that are accepted and some rejected due to low significance value. The relationship between entrepreneurship and agriculture extension is valued at 0.017 but the relationship is insignificant. Furthermore the table above also shows a significant relationship between entrepreneurial self-efficacy and agriculture intrapreneurship.

In addition results also show a significant relationship between individual barriers and agriculture extension. The value of association is 0.094 which asserts that 1% change in

individual barriers will bring about 9% change in agriculture extension. The less individual barriers, the greater adoption of the new agriculture technologies. Personal readiness has been found to be linked with agriculture extension and association and is valued at 0.434 which means that 1% change in personal readiness will bring about 43% change in agriculture extension. Thus it can be stated that if a person is willing to take risks then the chances of adoption of agriculture technologies increase significantly.

More importantly the relationships of IVs and mediator are significant. As per the table above the association between personal readiness and agriculture intrapreneurship is valued at 0.11 and is significant. 1% change in personal readiness will boost intrapreneurial behavior by 11%. Similarly entrepreneurship self-efficacy has also been found to be linked with agriculture intrapreneurship which is valued at 0.173 affirming that 1% change in entrepreneurship self-efficacy will bring about 17% change in agriculture intrapreneurship.

All the hypotheses were significant except the association between entrepreneurial self-efficacy and agriculture extension. Hypothesis H1, H3, H4 and H5 are supported by the results whereas hypothesis H2 is not supported by the results.

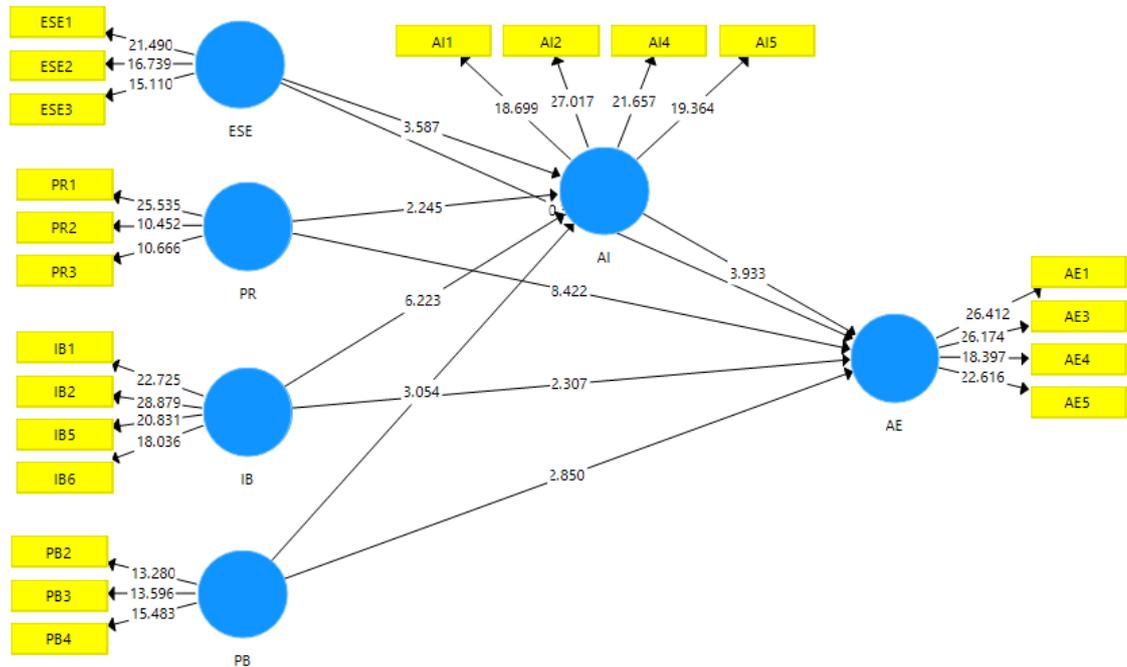
Specific Indirect Paths

Table 5:

Relationships	Beta	SD	t value	p value
ESE -> AI -> AE	0.032	0.012	2.647	p<0.05
IB -> AI -> AE	0.056	0.016	3.443	p<0.05
PB -> AI -> AE	0.027	0.012	2.202	p<0.05
PR -> AI -> AE	0.020	0.011	1.903	p<0.05

Table 5 above shows the mediation relationships between the variables according to which all the mediations are accepted which asserts that agriculture intrapreneurship is a significant mediator between IVs (ESE, IB, PB and PR) and DV (AE). Figure 4 below shows the relationship paths between the variables and their effect size:

Figure 4



Discussion

The behavioral factors and external environment play a vital role in adoption or rejection of new technologies and practices in every domain of business and organizations. There are also some factors which serve as a hindrance and thus bearing in mind the importance of behavioral and other factors, the current research study attempted to explore the impact of barriers and boosters to agriculture extension adoption. Moreover the study also considered the mediation role of agriculture intrapreneurship. By collecting data from the students the study, findings were reported about the significant relationships between the identified variables.

All the hypotheses of the present study are accepted in the light of the significant results reported in Tables 4 and 5 above. The results of the study accomplished its objectives and answered the research questions successfully. As per the results of the study the strongest predictor is personal readiness which affirms that if an individual is capable of doing something new or has a courage to engage in risk taking, they will surely be more inclined to agriculture extension (The adoption of the new agricultural technologies in agriculture).



Conclusion and Future Directions

This paper has significantly contributed to the existing knowledge by combining the factors which can boost and hinder the adoption of agriculture extension. While doing so the current study has also provided a guideline to the policy makers to consider the factors for successful application and sustainability of agriculture extension in their respective country. It can be concluded that the personal readiness and the self-efficacy of farmers will engage them more in agriculture extension.

The study has answered the research questions successfully however there are some limitations which need to be researched in the future. The study has adopted a quantitative approach and ratings from the students could have resulted in bias and so future research could utilize a mixed methodology to study a similar research framework with other respondents. Furthermore, future research may also be conducted which considers the moderating variable of environmental factors to gain further insights for agriculture extension adoption.

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