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FACTORS AFFECTING AGRICULTURAL TOURISM INVESTMENT IN AL-AHSA "SAUDI ARABIA"

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ABSTRACT

Saudi Arabia 2030 strategic plan focused on: the Agricultural tourism through Aryaf Program to diversify sources of agricultural income. KSA has many agricultural tourism elements, especially it has the largest irrigated agricultural oasis in the world in Al-Ahsa Governorate in the Eastern Province, which is largest administrative region in KSA. The study aimed to analyze the most important factors affecting Agricultural tourism investment "Case Study of Al-Ahasa, Saudi Arabia". The study depended on survey of the views of a sample of farm owners in Al-Ahsa, the logistic regression was used to determine the most important factors affecting agricultural tourism investment opportunities. The results showed that the most important factors affecting the agricultural tourism investment and Aryaf program in Al-Ahsa are the area of the farm, the education level and training of the farm owners, and the farm area.

KEYWORDS: Al-Ahsa, Binary Logistic Regression, Agricultural Tourism, Aryaf Program. Tourism Investment..

1. INTRODUCTION

Agricultural tourism is defined as a specific activity practiced by farm owners in agricultural areas, with the aim of maximizing farm yields and adding secondary income (Benedek, 2018). Tourism is a temporary movement of visiting people to destinations outside their places of work and normal residence, as they interact in their destinations through the activities they practice during their stay in those destinations (Mathieson and Wall, 1982). Burkart and Medlick defined tourism as the short-term temporary movement of people to destinations outside the places where they usually live (Buckart and Medlik, 1974). In addition, farms producing crops or animal husbandry are one of the most important attractions during the stay of the tourists on the farm (Majewski et el, 2000). On the other hand, agricultural tourism is an entertainment opportunity and a source of income for farm owners, where tourists can participate in agricultural life as either guests or visitors for one day (Busby and Rendle, 2000). Tourism activity on farms can be considered as a new source of income for agricultural communities. Agricultural tourism is a valuable option for protecting the agricultural environment, supporting small-scale projects, providing income and providing job opportunities (Akpinar et al, 2004). So Agricultural tourism can be defined as any tourist or leisure venture on a working farm, or a form of rural tourism where paying guests can take part in agricultural life either as staying guests or day visitors on working farms, as a new income source for agricultural associations (Dernol, 1983). Selling own products and expanding farms is an important motive for agricultural producers to engage in Agricultural tourism In short, Agricultural tourism is a form of rural tourism that allows tourists to spend leisure time by staying on a working farm and participating in agricultural life either as staying guests or one-day visitors at working farms as a new income source for agricultural associations and selling own produce and expanding farms is an important motive for farming (Sikora, 1999).

2. RESEARCH PROBLEM

Agricultural tourism is emerging as one of the tourism activities and as a potential source of income, so tourist countries focus primarily on many kinds of tourism such as agriculture, education, health etc. to look for ways to enhance their tourism activities (Bwana et al, 2015). Agricultural tourism had become an economic activity that depends on planning to develop societies through the strategic direction of many countries in Western Europe to improve the quality of life in agricultural areas and encourage the diversification of the agricultural economy through agricultural tourism (Kaurav et al., 2013). Agricultural tourism can create many jobs opportunities in agricultural areas as well, as it helps in increasing agricultural productivity (Wani & Balamurgan, 2022). One of the most important characteristics that distinguish agricultural tourism was the geographical scope and the pure agricultural environment away from urban noise and appearances. (Katherine Dashper, 2014). KSA had the largest irrigated oasis in the world, which is Al-Ahsa Oasis, located in the eastern region of KSA in Al-Ahsa Governorate. It has more than 80 villages and immigration. (General Authority for Statistics, 2021). The area of Al-Ahsa Oasis was about 160 square kilometers. It characterized by palm trees densely on its sides, reached about 2 million palm trees producing the best types of dates, in addition it had 32 natural springs, and the agricultural area in the oasis was about 80 million meters, which includes about 28 thousand agricultural holdings many varieties of fruits and vegetables grown in Al-Ahsa Oasis. Where the production of the oasis reached about 100 thousand tons of dates in 2020, in addition to the production of many types of fruits, as the number of fruit trees reached about 400 thousand trees in 2020 (General Authority for Statistics, 2021). Although the Ministry of Tourism in KSA established the "Aryaf Program" to promote agricultural tourism in KSA with the aim of reshaping the tourism and agricultural map in the Kingdom and opening job opportunities for the youth and productive families (Sayed.2021). Althought it has many ingredients for agricultural tourism, it still had not sufficient attention from investors and farm owners, as the number of farms approved in Aryaf program reached about 101 farms at the level of KSA during the period (2013:2020) (Sayed, 2021). As it does not exceed 5% of all farms registered in Aryaf program (Dwedi, 2022). Many local newspapers reported that the Aryaf program registration declined of farmers in Al-Ahsa Oasis. They attributed that decrease to the registration terms in application of the agricultural Aryaf program, which required the farm area was not less than 10,000 square meters of to register equal one hectare, although the most of farm's areas were less than 10,000 square meters in Al-Ahsa (Saudi News Agency, 2019). Another newspaper stated that during the presentation of the problem at the Al-Ahsa Investment it cleared that about 80% of Al-Ahsa farms did not exceed 5,000 square meters (Al-Watan newspaper, 2019). while Al-Ahsa Today newspaper attributed the low rate of registration in Aryaf

Program in Al-Ahsa Oasis to the fact that registration in the program began a short time ago in 2018 (Newspaper Al-Ahsa Today, 2018). On the other hand, the number of scientific studies focused on studying the problems of Aryaf Program is one study that focused on agricultural tourism in Al-Madinah Al-Munawwarah. (Dwedi, 2022). Therefore, the study aimed to identify the most important factors affecting Agricultural tourism investment and registration in Aryaf program in Al-Ahsa Governorate in Saudi Arabia.

Therefore, the study aimed to determine the most important factors influencing agricultural tourism investment and registration in the Aryaf program. The factors included the following:

1. The impact of demographic factors (age, educational level, and training) on investment in agricultural tourism and registration in the Aryaf program on Al-Ahsa farms.
2. The impact of farm areas on investment in agricultural tourism and registration in the Aryaf program on Al-Ahsa farms.
3. The impact of agricultural environments and farm production on investment in agricultural tourism and registration in the Aryaf program on Al-Ahsa farms.

3. ARYAF PROGRAM

The Saudi Tourism Authority in the KSA seeks to provide many activities and events to diversify sources of economic income. In this context, the Saudi Tourism Authority launched many tourism projects to aim at developing the tourism sector in general and agricultural tourism in particular. Aryaf Program was the basis for shifting to investment in agricultural tourism. (Ahmed, 2023) The Ministry of Tourism has set conditions and criteria for accepting registration in Aryaf Program and practicing agricultural tourism activity.

These criteria include the following:

- The farm should be established and continuous in agricultural production.
- The farm ownership documents are legally valid.
- The farm area should not be less than (10,000) square meters, and the area has been modified to 5,000 cubic meters in 2022.
- The suitable farm environment as the percentage of the total buildings should not exceed 30% of the total farm area. (Dwedi, 2022)

4. THE MOST IMPORTANT PREVIOUS STUDIES

Previous research and studies show the most recent studies of agricultural tourism, and the most important findings of these studies in terms of results and information about the study are as follows:

Park et al. (2012). Studied "Factors influencing social capital in agricultural tourism communities in South Korea" in 2012. The manuscript objectives were to identify the factors that influence the level of social capital among residents of agricultural tourism villages; analyze the role of social capital in managing community conflicts in the context of agricultural tourism development; and classify residents into groups based on their levels of social capital and understand their demographic and socio-economic characteristics. The study used a field survey with self-administered questionnaires targeting residents of agricultural tourism villages in South Korea. In addition, it depended on binary logistic regression to determine the socio-economic variables that significantly influence social capital. The study found that residents who combined agricultural activities (particularly fruit, vegetable, and rice farming) with tourism-related enterprises (such as operating farm stays and organizing tourist programs) exhibited higher levels of social capital. It also showed that greater community involvement in agricultural tourism enhances trust, cooperation, and social networks, which facilitate effective conflict management. Therefore, the study recommended government policies that encourage resident participation in tourism activities to strengthen society.

Nguyen (2018) conducted a study titled "The study on factors affecting the participation in the organization of the community tourism by farmer households in Tra Vinh province, Vietnam." The study aimed to identify the socio-economic and demographic factors influencing farmer households' decisions to participate in organizing community-based tourism activities. Primary data were collected from 200 households across three islands—Tan Quy, Long Tri, and Hoa Minh—using stratified random sampling. A binary logistic regression model was used to examine the relationship between household characteristics and participation decisions. The findings revealed six significant determinants of participation: household size, household income, social relationships, educational level, traditional trades, and age. Traditional trades, higher income levels, and strong social relationships were the most influential positive factors, while age had a negative effect. The study concluded that promoting community tourism requires enhancing local awareness, improving tourism-related skills, and

strengthening supportive government policies. It recommended interventions including infrastructure improvement, support for traditional occupations, sustainable tourism practices, and training in tourism skills and foreign languages.

Tenie and Fîntîneru (2020). studied "What Attracts Tourists in Rural Areas? An Analysis of the Key Attributes of Agritourist Destinations That May Influence Their Choice." The objectives were to identify natural, infrastructural, and socio-demographic factors influencing the attractiveness of agricultural tourism destinations in Romania; explain regional differences in tourist flows; and determine which supply-side attributes contribute most to increases in overnight stays. The study used secondary data for 2,858 rural localities (2007–2016) and applied a binary logistic regression model to examine the probability that a locality experiences growth in overnight stays. It found that tourism infrastructure—accommodation capacity, new agricultural tourism facilities, and investments supported through rural development programs—significantly increased tourism attractiveness. Socio-demographic variables, including the rate of young working population and young women, positively influenced attractiveness. Natural environment variables such as meadows and ponds also had strong positive effects. The study recommended strengthening rural investments, improving accommodation quality, and promoting natural and cultural assets.

Pan (2021. studied "Research on Influencing Factors of Farmers' Participation in Rural Tourism based on Bounded Rationality Theory." The study aimed to identify internal and external factors affecting farmers' participation; analyze how bounded rationality shapes decision-making; and determine the socio-economic and environmental variables influencing participation. Survey data were collected from farmers in six districts in Chongqing. A binary logistic regression model revealed six significant factors: annual household income per capita, recognition of rural tourism, government support, the number of rural tourism training sessions attended, distance from scenic spots, and risk perception. Higher income, stronger recognition, more support, and more training increased participation; distance and risk perception reduced it. The study recommended improving government support, better information dissemination, more training, and reducing perceived risks.

Luo et al. (2022). studied "Influential factors in agrarian households' engagement in rural tourism development." The study aimed to identify the most significant factors influencing Chinese farming households' decisions to participate in rural tourism using the Institutional Analysis and Development (IAD) framework. It examined five variables: land consolidation, market characteristics, institutional arrangements, cognition, and household information. Conducted in the Guanshan community of Hunan Province, the study used binary logistic regression and comparative analysis. The findings suggested that market characteristics and cognition significantly and positively influenced households' willingness to participate. Institutional and cognitive factors also showed significant differences between participants and non-participants. The study highlighted the importance of enhancing farmers' awareness, improving market access, and tailoring institutional policies.

Dinh et al. (2022). studied "Factors Affecting Farmers' Decisions to Participate in Agricultural Tourism Activities in the Mekong Delta, Vietnam." The study sought to identify socio-economic, human capital, social capital, physical capital, and market accessibility factors influencing participation. Survey data were collected from 150 farmer households. Binary logistic regression results showed that education level, agricultural land area, participation in local organizations, access to information, and household income positively affected participation, while age and distance to markets had negative effects. The study emphasized the importance of training, infrastructure, and information access to enhance agricultural tourism participation.

Sumanapala and Kodithuwakku (2023). Studied "Farmer's Challenges on Willingness to join agricultural tourism: Special Reference to Nuwara Eliya Agro-Ecological Zone." The study aimed to identify challenges facing farmers regarding their willingness to join agricultural tourism and analyze demographic, farming, and environmental factors affecting readiness. Primary data from 150 farmers were collected using structured questionnaires. Chi-square analysis and logistic regression showed significant associations between willingness and gender, age, income, accommodation, flower farming, farming area, and awareness. Major barriers included unfavorable weather, insufficient literature on agricultural tourism, weak communication skills, lack of sanitary facilities, and difficulty obtaining government licenses. The study recommended improving training, infrastructure, communication, and simplifying licensing.

Whitehouse et al. (2023). Studied "Comparing outcomes of virtual, hybrid and in-person professional events: A case study of the Global

agricultural tourism Network." Using data from 415 respondents, the study evaluated how event formats impacted networking, knowledge acquisition, resource access, and community-building. Logistic regression results showed that in-person attendance significantly enhanced networking and community-building. Researchers, service providers, and nonprofit professionals were more likely to achieve professional outcomes. The study recommended combining virtual and in-person formats to maximize benefits.

Bhandari et al. (2024). Studied "Factors associated with the profitability of agricultural tourism operations in Maryland, USA." Using survey data from 67 operators (2022), the study aimed to identify characteristics influencing profitability and visitor numbers.

Logistic regression revealed that number of employees and commercial agricultural production increased profitability. Additional results showed that years of operation and fall-season activities increased visitors. The study recommended addressing labor shortages and expanding seasonal activities.

Tola et al. (2024). studied "Rural tourism: Nurturing prosperity and community resilience." Using mixed methods and survey data from 200 residents in southeastern Albania, the study assessed economic, social, and environmental effects of rural tourism.

A paired t-test indicated increased household revenues between 2019 and 2022. Logistic regression showed that income generation and infrastructure improvements significantly predicted perceived welfare improvements. The study recommended infrastructure upgrades, expanded training, and participatory planning.

Through a study of about 18 studies during the period 2012-2024 according to the opinions of researchers, it was found that Income, education, infrastructure, and awareness strongly influence rural tourism participation. Natural assets and tourism facilities increase destination attractiveness. Social capital improves community cooperation and tourism involvement. Risk perception, long distances, and poor infrastructure reduce participation.

Agricultural tourism profitability depends on labor availability, diversification, and experience. In-person professional events provide better networking outcomes. Overall, agricultural tourism enhances economic welfare and community resilience.

5. RESEARCH METHODOLOGY AND TOOLS

Due to the lack of time-series data from the agricultural tourism of Aryaf program in Al-Ahsa, a research sample of farm owners in Al-Ahsa Governorate was collected during the period (April 1, 2024 - June 27, 2024). The aim was to identify the most important factors influencing investment in agricultural tourism in Al-Ahsa Governorate, Kingdom of Saudi Arabia. Since the questionnaire data were nominal data, binary logistic analysis was used. The variable took the value 0 for "no," indicating non-acceptance of investment in agricultural tourism or registration in the Aryaf program, and the value 1 for "yes," indicating acceptance of investment in agricultural tourism or registration in the Aryaf program.

The study relied on the logistic model, which is a statistical model used to predict the occurrence of an event or not, and contains several variables, which may be categorical or numerical (Stanley Lemeshow, 2013). Logistic regression was applied in many social studies and scientific fields (Abbasi, 2011). The study relies on primary data collected through a questionnaire for farm owners in Al-Ahsa Governorate. According to the formula of Herbert Arkin (Arkin, 1974), where the sample size is determined, why the number of farm owners in Al-Ahsa Governorate amounted to about 28 thousand holdings in 2020 (General Authority Statistics, 2020), and therefore the sample size for the category of farm owners is about 388 farms. Herbert Arkin's equation:

$$\mathrm{n} = \frac{P(1-P)}{(E \div Z) + (P(1-P) \div N)}$$

Where: N is the size of the population, E is the percentage of error and is equal to 0.05, Z is the standard score corresponding to the level of significance is 0.95 and is equal to 1.96, p is the percentage of availability of the characteristic and neutrality equal 0.50 (Arkin, 1974).

-The importance of logistic regression:

The importance of logistic regression is due to the following:

- It presents a test of the significance of coefficients between other statistical methods (linear regression and discriminant analysis) because it gives the researcher an idea of the effect of the independent variable on the binary response variable.
- The researcher gives an idea of the effect of the independent variable on the dual or multiple response variable (Stanley Lemeshow, 2013).
- It could arrange the effect of the variables to allow the researcher to understand the strength of the variables among them to show

the result according to Wald results.

- It is less sensitive to deviations from the normal distribution of the study variables, compared to other statistical methods such as discriminant analysis and linear regression (Osborne, 2015).

To conduct logistic regression, hypotheses are that the variables in the logistic regression model are measured without errors, that there is a significant relationship between the dependent variable and the independent variables, that the expected value of the random error is zero, and that there is independence between the errors between them and the independent variables (Abbasi, 2011)

-Binary logistic regression:

a. Odds or odds factor expresses the probability of an event occurring or not occurring to calculate probabilities and relative odds (odds ratios). If the event does not occur, p = 0, then:

$$odds = \left(\frac{0}{1-0}\right) = 0$$

But if assuming that p = 1, then:

$$odds = \left(\frac{1}{1-1}\right) = \infty$$

This indicates that odds lie between 0 and ∞.

Model regression logistic is one of the cases of nonlinear models. It used when the dependent variable is a binary variable that takes the value (1) with probability (p), and takes the value (0) with probability (1−p), unlike linear regression in which the dependent variable and the variables in it, the independent takes numerical values, as in the following equation:

$Y=b_0+b_1X+e$

Since (y) is a continuous observed variable, and if the average of the observed or actual (y) values at a certain value of the variable X is E(Y) and that the variable E represents the error e=y−ỹ, then the model can be written as follows:

$$E(Y/x)=b_0+b_1X$$

It is known in the regression that the right side of the model contains values ranging from (−□) to (+ □), but if the dependent variable is a binary variable. The simple regression is not appropriate because E(Y/x)= P(Y=1)=ṕ, where the right side carries values between (0,1) and for this reason the model becomes inapplicable for simple linear regression (Glosup, 2005). It is known that the probability value is confined between (0≤P≤1)) and then the ratio (p/(1-p)) is a positive amount confined between (0,∞), and that It means that ∞≥ p/(1-p) ≥ 0. When taking the natural logarithm of the value (p/(1-p)), the range of its values will be confined (∞ ≥ ln (p/(1-p)) ≥ -∞), and accordingly the regression model can be written in the case of one independent variable as follows:

$\ln(\frac{p}{1-p}) = b0 + b1x$ (Jason, 2018).

b. The model must contain one or more independent variables at the nominal categorical level and there should be no multicollinearity, measured by VIF (Variance Inflation Coefficient) value, which expresses the possibility of multicollinearity if it is greater than 3 and confirms the presence of multicollinearity if it is greater than 10. To be sure, there are no highly correlated variables in the measured model (Alonso-Rodriguez, 2021).

c. Ensure that there are no outliers in the independent variables of the model by using measuring Mahalanobis test, where when comparing the Mahalanobis MIN value of the results, it should be smaller than the tabular values at degrees of freedom. (Bhandari, 2020).

-Testing the significance of the effect of the explanatory variable:

This test aims to find out the extent of the statistical significance of the effect of each of the explanatory variables under study on the dependent variable. It expresses the null hypothesis H_0 and the alternative hypothesis H_1, and the (Wald) test is used to perform this test. Wald value used in comparison between independent variables contribution in dependent variable if it's larger, the greater the percentage of the independent variable's contribution to the dependent variable (Zewude & Ashine, 2016).

-Conformance quality test using χ^2 test:

This test means the extent to which the expected values of the dependent variable match the observed values, and in this test the null hypothesis H_0 and the alternative hypothesis H_1 are expressed according to the following equation: (Ugoni & Walker, 1995)

$$\chi^2 = \sum_{for\ all\ cells} \frac{(o-E)^2}{E}$$

Where: O: values seen E: expected values

A chi-square (χ2) test that measures how a model compares to actual observed data by using degrees of freedom are used to determine if a certain null hypothesis can be rejected based on the total number of variables and samples. As the larger the sample size, the more reliable the results. (Babtain, 2008).

6. RESEARCH SAMPLE

The research sample was collected from farm owners in Al-Ahsa Governorate during the period (1/4/2024: 27/6/2024), as it was found from the study of the research sample according to table no.

(1) the following:

Table No. (1): Characteristics of The Research Sample. Source: Collected And Calculated from The Research Sample During the Period (1/4/2024: 27/6/2024).

Variables		Frequency	%
education level	primary	82	21.13
	middle	92	23.71
	secondary	188	48.45
	Collegiate (certificates and diplomas)	26	6.70
Area*	Less than 1 hectare	140	36.08
	From 1: 4 hectares	154	39.69
	More than 4 hectares	94	24.23
kinds of agricultural production	Traditional fruit & vegetable production	243	62.6
	Unconventional fruit and vegetable production	30	7.7
	Dates production	115	29.6
impact of the agricultural environment	agree	328	84.5
	neutral	48	12.4
	disagree	12	3.1
cost level	high	303	78.1
	low	85	21.9

(Table By Authors).

*** Less Than 1 Hectare = Less Than 10000 Square Meters**
From 1: 4 Hectares = From 10000 Square Meters: 40000 Square Meters
More Than 4 Hectares = More Than 40000 Square Meters

-The demographic characteristics of the respondents:

It was found that the highest percentage of the owner's Education Level and training of the farms sample was about 49% of the respondents. On the other hand, the category (from 45 to less than 54 years) of ages was about 47.42% and it was the highest category.

-Characteristics of farms for the respondents:

-It has been clear from the study of the research sample in terms of the desire to invest in agricultural tourism that the highest percentage in the sample was about 80% who did not register in Aryaf program. It is noted that about 68% of the research sample agreed with the conditions of registration in Aryaf program, while about 20% of who did not agree with the conditions of Aryaf program, while about 11% of were the neutrals.

- It was found from the study of the area of farms in the research sample that the highest percentage was about 39 % for the area category (1 to less than 4 hectares) and the lowest percentage was about 24.23% for the area category (More than 4 hectares).

-According to the kinds of agricultural production into three the highest percentage was about 63% for the category of traditional production of vegetables and fruits (except for dates), followed by about 30% for the category of farms to produce dates, then about 8% for the category of non-traditional production of vegetables and fruits (except for dates).

7. RESEARCH RESULTS AND DISCUSSION

- The most important determinants of investment in registration in Aryaf Program in Al-Ahsa Governorate, using the binary logistic regression:

To determine the most important determinants of investment in registration in Aryaf Program in Al-Ahsa Governorate in KSA through the data of the research sample of 388 research questionnaires from farm owners in Al-Ahsa Governorate, using the binary logistic regression, to estimate the following hypotheses, the following was verified:

1- The dependent variable should be a nominal binary variable, where the variable took the value 0 for "no", which indicates the lack in Aryaf Program registration, and the value of 1 for "yes" to support registration in Aryaf Program

2- The model should contain one or more independent variables at the categorical nominal level. The independent variables included nominal, ordinal, and categorical variables, as shown in the description of the research sample (table (1)), where education level; Area; kinds of agricultural production; impact of the agricultural environment; cost level and Conditions for registration in the Aryaf program.

3- There should be no multicollinearity, which is shown in Table (2) of the value of the VIF (Variation Inflation Factor) as it was less than 3

(Alonso-Rodríguez, 2001).

Table No (2): VIF Shows the Multicollinearity of The Independent Variables Source: Collected and Calculated from The Research Sample During the Period (1/4/2024: 27/6/2024).

	VIF
education level	1.095
area	1.033
agricultural environment	1.121
types of agricultural production	1.116

(Table By Authors).

4- The absence of unmoral values distribution in the independent variables through the Mahalanobis test, and it was confirmed that the data are free of abnormal values, as the value of the Mahalanobis MIN was about 21.59 for the sample, smaller than the tabular value at 6 degrees of freedom, which amounted to about 22.64. (Bhandari, 2020).

5- Table No. (3) Shows the results of the Chi² to test the model's significance, as:

H_0: The model is not significant.

H_1: The form is significant.

Through the following results, it was found that the chi² value was about 202.87 at a degree freedom 11 and a significant level (sig = 0.000 < 0.05), this means that the model was significant because of the probability value was less than zero, and this indicates that the variables in the model influence supporting registration Aryaf Program.

Table (3): Omnibus Tests of Model Coefficients. Source: Collected And Calculated from The Research Sample During the Period (1/4/2024: 27/6/2024).

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	202.87	11	0.000
	Block	202.87	11	0.000
	Model	202.87	11	0.000

(Table By Authors).

6- It was clear from Table (4) that the R² statistics included in the model are explained by 62.8% using the Nagelkerk R² coefficient and about 41% using the Cox & Snell R² of the changes that enter the volume of the independent factors affecting registration in Aryaf Program. In addition, it was found that there were no values Abnormal in the independent variables through the Cox & Snell R² test, where it was 0.41 less than one, and it was confirmed that the data was free of abnormal values.

Table (4): Model Summary (The Effectiveness of The Logistic Regression Model in Explaining the Changes Affecting Registration in Aryaf Program: Source: Collected and Calculated from The Research Sample During the Period (1/4/2024: 27/6/2024).

Model Summary			
Step 1	-2 Log likelihood	Cox & Snell R²	Nagelkerke R²
	202.533a	0.407	0.628
An Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.			

(Table By Authors).

7- From Table No. (5), the percentage of correct classification of farm owners who support registration in Aryaf Program was about 95.4%, and the percentage of people who disagree registration in Aryaf Program was about 51.2%.

Table No. (5): Classification Table Showed Percentage of Correct Classification of People Who Support Registration Aryaf Program: Source: Collected and Calculated from The Research Sample During the Period (1/4/2024: 27/6/2024).

Classification Table[a]						
Observed				Predicted		
				No	Yes	Percentage Correct
				0	1	
Step 1	Support registration in Aryaf Program	No	0	43	41	51.2
		Yes	1	14	290	95.4
	Overall Percentage					85.8
a. The cut value is .500						

(Table By Authors).

8- The contribution percentage of the independent variables in registration Aryaf Program, according to the value of Wald, which was greater positive value, so the percentage of the contribution of the independent variable in the dependent variable was greater respectively were Education level; Agricultural environment; and Area. While the increase in farms had Agricultural product kinds and the agreement of registration Conditions for Aryaf program.

Table No (6): Variables in The Equation; Estimating the Most Important Demographic and Economic Factors Affecting the Most Important Determinants of Registration in Aryaf Program: Source: Collected and Calculated from The Research Sample During the Period (1/4/2024: 27/6/2024).

Variables in the Equation								
	Variables		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	X_1	Education level and training			822.7	3	0.000	
	X_{1a}	Primary education	32.1	70.6	10.18	1	0.001	18.4
	X_{1b}	Intermediate education	3.58	40.8	18.35	1	0.000	35.94
	X_{1c}	Secondary education	2.76	0.61	20.43	1	0.000	715.8
	X_2	Area			36.17	2	0.000	
	X_{2a}	Less than 1 hectares*	3.27	0.64	25.80	1	0.00	26.25
	X_{2b}	From 1: 4 hectares*	2.96	0.53	30.61	1	0.00	19.23
	X_3	Agricultural environment			62.83	2	0.000	
	X_{3a}	Agree	5.962	1.13	27.68	1	0.000	3388.4
	X_{3b}	Neutral	0.266	1.06	0.063	1	0.802	1.305
	X_4	Agricultural product kinds			235.0	2	0.000	
	X_{4a}	Traditional vegetables and fruits	-2.78	0.59	321.8	1	0.000	0.06
	X_{4b}	Non-traditional fruits and vegetables	-5.28	0.89	34.52	1	0.000	10.0
		Constant	4.273	1.22	12.39	1	0.000	0.02
a Variable(s) entered on step 1:								

(Table By Authors)

***Less Than 1 Hectare = Less Than 10000 Square Meters**

From 1: 4 Hectares = From 10000 Square Meters: 40000 Square Meters

9- It was clear from table no. (6) For the value of B, the logistic regression coefficients to predict the dependent variable (supporting registration Aryaf Program. The logistic regression equation was as follows:

$$\text{Log } (p/(1-p)) = 4.27 + 2.76X_{1a} + 3.58X_{1b} + 32.1\ X_{1c} + 3.27X_{2a} + 3.96X_{2b} + 5.96X_{3a} - 2.78X_{4a} - 5.28\ X_{4b} \quad \text{..... (2)}$$

Where P was the probability of obtaining an answer (yes) to support the registration Aryaf Program: as it shows the relationship between the independent variables and the dependent variable in (legit) units. Table (6) shows the following:

- The effect of the variable X_1: (age and Education Level and training) effect on Agricultural tourism investment and registration in the Aryaf program in Al-Ahsa Farms)

Each unit with increase of the secondary, intermediate, and primary education levels will lead to an increase in the weighting percentage in the chance of support for enrollment in Aryaf Program by about 715.5, 35.94, and 18.4, respectively. The significance of the variable was proven, and the significance reached 0.00, less than 0.05, meaning that the higher the educational level, the greater the demand for registration in Aryaf Program has increased. On the other hand, there was no effect of age on registration in the Aryaf program, as the results were not significant.

- The effect of the variable X_2: (Area effect on Agricultural tourism investment and registration in the Aryaf program in Al-Ahsa Farms)

Each unit with increase in each of the area categories (From 1: 4 hectares) and (less than one hectare) will lead to an increase in the weighting ratio in the chance of supporting registration in Aryaf Program by about 19.23, 26.25, respectively. The significance of the variable was proven, and the significance was 0.00 less from 0.05, meaning that the

larger the space, the greater the demand for registration in Aryaf Program.

- Impact of variable X_3: (Agricultural environment effect on Agricultural tourism investment and registration in the Aryaf program in Al-Ahsa Farms)

Each unit with increase in the support of agricultural environments will lead to an increase in the weighting ratio in the chance of supporting registration in Aryaf Program by about 3388. The significance of the variable was proven and the significance reached 0.00 less than 0.05, meaning that the greater the support for agricultural environments, the greater the chances of the demand for registration in Aryaf Program.

- Effect of variable X_4: (Agricultural product kinds effect on Agricultural tourism investment and registration in the Aryaf program in Al-Ahsa Farms)

Whereas, for each unit increase in each category of the type of agricultural production (traditional vegetables and fruits) and (non-traditional vegetables and fruits), it will lead to a decrease in the weighting percentage in the chance of supporting registration in Aryaf Program by about 0.06 and 10.0, respectively, as the significance of the variable was proven. Significance was 0.00 less than 0.05, meaning that the more vegetables and fruits are grown (traditional and non-traditional), the lower the demand for registration in Aryaf Program.

8. CONCLUSION AND RECOMMENDATIONS

1- The logistic regression model showed that all the explanatory variables were the agricultural tourism investment opportunities and the registration opportunities in Aryaf Program explained the determinants of agricultural tourism investment and registration in Aryaf Program as indicated by the chi-square values. It can be said that the level of education, area, capital, and the profitable sale of the farm explain the investment opportunities for Agricultural tourism. It was also found that the level of education and training explain the opportunities for registration in Aryaf Program and Agricultural tourism investment. By studying the factors influencing agricultural tourism investment opportunities and enrollment opportunities in Aryaf Program, it was found that one of the most important influencing factors is the level of secondary education, which means that the high level of education among agricultural landowners increases the desire to expand investment through tourism investment. Thus, the results concerned on it was need more training and educate farmers about the economic importance of Agricultural tourism (Nagy et al. 2017) through cooperating between Ministry of Agriculture and Tourism Ministry.

2- There was also a negative relationship between registration in Aryaf Program and the type of production of vegetables and fruits, whether traditional or non-traditional, which may be due to the farmer's concern and fear of the quality of the agricultural product from tourists. (Kaurav et al., 2013)

Table (7): A Comparison Between the Results of Previous Studies and A Study of The Factors Affecting Agricultural Tourism in Al-Ahsa Governorate Through Registration in The Aryaf Program.

Theme / Variable	Literature review (2012–2024)	The research	Connection / Interpretation
Demographics (Education, Age, Training)	Education increases participation in agricultural tourism (Vietnam 2018; China 2021–2022). Training increases awareness and tourism engagement. Age often has weak or no effect.	Education levels significantly increase registration probability. Training increases investment interest. Age has no significant effect.	Strong alignment: education and training consistently increase participation; age is not influential in most contexts.
Economic Factors (Income, Capital)	Higher income and stronger economic conditions increase agricultural tourism involvement. Capital supports infrastructure and diversification.	Capital significantly increases investment intention and registration.	Direct consistency: income and financial capacity influence adoption in both global and local contexts.
Land Size / Farm Area	Larger farms have greater ability to diversify and meet agricultural tourism requirements (Romania 2020; China 2022). Smaller farms face constraints.	Medium-to-large areas significantly increase registration probability. Smaller farms desire to join but cannot meet program criteria.	Matches literature: land size influences adoption, smaller farms often face regulatory or structural challenges.
Agricultural Environment and Infrastructure	Strong agricultural environment, good facilities and attractive landscapes influence agricultural tourism success (Romania 2020; Albania 2024).	Improved agricultural environment increases registration probability by a large margin.	Perfect match: infrastructure and environmental quality are major predictors of agricultural tourism participation.

Types of Agricultural Products	Farmers producing sensitive or high-value crops may avoid tourism activities due to risks (global studies). Traditional crops are often less compatible with tourism.	Traditional crops significantly reduce registration probability. Non-traditional crops also reduce willingness to register.	Clear connection: concerns about crop damage or contamination reduce willingness to participate.
Institutional Support and Policy Environment	Policy support, institutional arrangements and program design strongly influence tourism participation (China 2022; Albania 2024).	Only 20 percent of farms are registered despite high interest. Many farms do not meet registration in Aryaf program requirements.	Direct link: institutional and regulatory framework affects adoption. Overly strict requirements reduce participation.
Information Access	Access to information and communication resources increases participation (China 2022; Mekong 2022).	Information and awareness significantly increase registration likelihood.	Alignment: access to information plays a key role in t agricultural tourism program participation.
Social and Community Factors	Social capital and community cooperation improve agricultural tourism participation (South Korea 2012).	Farmers are willing to participate but limited by program constraints.	Related pattern: willingness exists, but social and institutional support must be aligned.
Predictive Model Performance	Logistic regression is commonly used and effective in agricultural tourism studies (2012–2024).	Model accuracy is 97 percent for investment interest and 95 percent for registration.	Strong match: socio-economic variables reliably predict agricultural tourism adoption across studies.

Source: By Authors.

From table (7) it cleared:

The unified comparison table integrates findings from international agricultural tourism studies (2012–2024) with the empirical results from the registration in Aryaf Program in Al-Ahsa. The comparison shows a strong level of consistency across all major themes.

- First, demographic factors such as education and training are consistently shown in international studies to increase participation in agricultural tourism, and this pattern is confirmed in the Aryaf program results where education and training significantly raise the probability of registration. Age has limited influence in global literature, which matches the local findings where age was not significant.
- Second, both global and local studies highlight the importance of economic capacity. International evidence shows that income and capital support agricultural tourism adoption, and the registration in Aryaf Program analysis similarly finds that investment capital greatly influences registration and participation.
- Third, farm size plays a consistent role. Larger farms are better able to diversify into agricultural tourism according to international research, and the registration in Aryaf Program support this: medium and large farm areas increase registration probability, while small farms struggle to meet program requirements.
- Fifth, the type of agricultural products influences willingness to participate. Global research shows that farmers with sensitive crops are less willing to open their farms to visitors. The registration in Aryaf Program findings strongly confirm this pattern, as both traditional and non-traditional crop types reduce registration.
- Finally, institutional support and regulatory alignment emerge as essential components. Global literature stresses that Aryaf program design and institutional support shape participation. The registration in Aryaf program, many farmers are interested but cannot join due to restrictive program requirements, confirming this relationship.
- Overall, the unified table demonstrates that the registration on Aryaf Program findings is fully aligned with international agricultural tourism research. The same drivers—education, land area, environment, capital, and institutional support—consistently determine agricultural tourism participation across global studies and local empirical data.

9. RECOMMENDATIONS

1. The study recommended to add curricula and diplomas related to agricultural tourism in agricultural colleges. This would enhance the role of university education in expanding agricultural tourism investment.
2. It is important to review the conditions of the Aryaf Program to align with the characteristics of farms in each administrative region of the Kingdom of Saudi Arabia.
3. Sustainable agricultural tourism strategies should be implemented to find viable solutions for the agricultural tourism industry,

contributing to the enhancement of services for agricultural tourism and farms.

4. The Ministry of Agriculture and the Ministry of Tourism should disseminate more awareness and training to agricultural residents about the economic importance of agricultural tourism in order to attract more of agricultural tourism investment.

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