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Antecedents of Agricultural Entrepreneurial Competencies in Mixed Cropping Zone of Punjab, Pakistan

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Abstract:

Agricultural entrepreneurship stands as a transformative force in rural economies, particularly in regions like Punjab Pakistan where mixed cropping system dominate agricultural practices. The present study investigates the socio-economic, educational and resource-based factors that shape the agricultural entrepreneurial competencies addressing a critical gap in the context specific research on agricultural entrepreneurship. The present study was designed to find quantitative association and correlation of factors that has either positive or negative relationship with agricultural entrepreneurial competencies. For data collection one of district from mixed cropping zone was selected randomly. The selected District (Sahiwal) was comprises of Evo tehsils. A list of registered growers was obtained from the office of Deputy District Officer Agriculture (Ext.) Using online available software (surveysystems.com) a sample size of 382 was obtained by maintain confidence level of 9ñ% and confidence interval at 5. A valid and reliable interview schedule was developed for data collection. Data was collected by face-to-face interview technique. The results revealed that among socioeconomic factors age was the only factor that has non-significant relationship with the entrepreneurial competencies. Factors like annual income (r= 0.48) and educational level (r= 0.407) have positive linear relationship with entrepreneurial competencies. Among hindering factors that have negative linear relationship, personal factors (r=-0.412) and financial factors have strong negative correlation with agricultural entrepreneurial competencies. The results obtained by Multiple Linear regression model also confirm the multiple effect of personal factors with entrepreneurial competencies. The beta value (B = -0.363) indicates that for every one-unit increase in personal factors, entrepreneurial competencies decrease by 0.363 units. The results of present study draw the

attention of policy makers towards the need of personal development of farmers and provide interest free loans to small farming communities.

Keywords: Agricultural entrepreneurial competencies, association, correlation, hindering factors, policy makers, entrepreneurial competencies, socio-economic factors, loans for small land holders, capacity building of farmers

Introduction:

Agricultural entrepreneurship refers to the practice of turning farming into a business by innovating, managing, and marketing agricultural products and services to create profitable ventures, often combining sustainable farming practices with entrepreneurial skills. The correlation between socio-economic factors and agricultural entrepreneurial competencies holds paramount importance in the context of rural development and economic progress (Shahbaz et a1., 2021). Numerous factors contribute to the success of agricultural ventures. Among these factors, education and training play a pivotal role, as individuals with higher levels of education and specialized agricultural knowledge exhibit enhanced abilities to manage agricultural operations effectively (Khan et al., 2020). Furthermore, the availability of resources, such as land, financial capital, and technological infrastructure, significantly influences agricultural entrepreneurship. Regions with improved access to markets and transportation facilities tend to witness heightened competencies among agricultural entrepreneurs, facilitating better marketing and distribution of their products (Yaseen et a1., 2018).

The influence of government policies and support is also critical in creating a conducive environment for agricultural entrepreneurship. Favorable policies encompassing subsidies, credit accessibility, and agricultural extension services can promote and enhance the competencies of individuals involved in agricultural pursuits (Mazhar et al., 2021). Additionally, the presence of robust social networks and community support fosters entrepreneurial success in agriculture (Abbas et a1., 2016). Such social connections facilitate knowledge-sharing, collaboration, and risk-sharing in the entrepreneurial journey of farmers.

Economic stability and security emerge as fundamental factors shaping an individual's willingness to undertake entrepreneurial risks in the agriculture sector. Regions with greater economic stability often witness increased investment in agricultural ventures, ultimately leading to higher competencies in the agricultural domain (Zubair et al., 2023). Cultural attitudes towards entrepreneurship and agriculture exert considerable influence on the perception of agricultural ventures as viable career options. Cultures that value and promote entrepreneurship in agriculture generally experience heightened competencies among agricultural entrepreneurs (Muhammad et a1., 2017). Furthermore, environmental factors, including access to natural resources and climatic conditions significantly impact the types of agricultural (Mazhar et a1., 2021).

A clear picture of factors associated with the low adoption of agricultural entrepreneurial practices in the context of Punjab Pakistan was missing. The present study was intended to fi11 out that gap and further quantifying the association and relationship between hindering factors and their combined effect on entrepreneurial competencies. The present study will be helpful for policy making authorities to glance into the true analysis of associated factors responsible for the current dilemma of agriculture sector in Punjab Pakistan.

Methodology:

Mixed cropping zone of Punjab was selected due to its diversity in the farming and cropping systems and also due to its higher contribution in production graph of Pakistan. From the selected districts covering the mixed cropping zone one district was selected randomly. Resulted from random selection process district Sahiwal was selected. District Sahiwal is divided further into two tehsils i-e Sahiwal and Chichawatni. A list of all registered farmers in both tehsils was obtained from the office of Deputy Director Agriculture (Ext.) Sahiwal. A comprehensive list of registered farmers was obtained from the tehsils of Sahiwal and Chichawatni, comprising 34,710 and 27,680 individuals, respectively. To ensure a representative sample, a proportionate random sampling technique was employed. By maintaining a confidence interval of 5 and a confidence level of 95%, a sample size of 382 farmers was determined using online statistical software available at surveysystem.com. After a comprehensive literature review, factors that affect the entrepreneurial intensions were identified. Considering the context of Punjab Pakistan, factors were enlisted. After consultation with supervisory committee and expert panel from Institute of Agricultural Extension, Education and Rural Development University of Agriculture Faisalabad a valid and reliable interview schedule was developed. The validity was testified by expert using face validity and content validity methods. The reliability of questionnaire was measured using Internal consistency method. This method assesses the consistency within the instrument, gauging how well a set of items measures a specific behavior or characteristic within the test. Internal consistency relies on the average correlations among all individual items. To assess the internal consistency of the instrument, the researcher utilized Cronbach's alpha, which was computed using the SPSS (Statistical Package for the Social Sciences) software. The calculated Cronbach's alpha values for the majority of variables fell within the range of 0.77 to 0.88, indicating satisfactory reliability. The was collected by the researcher by face to face interviewing the respondents at their home, farms, streets, local tea stalls, pesticide dealer shops and in local mosques. Before asking the questions, respondents were assured about confidentiality of recorded data and surety of its use for safe academic purpose. After the data collection, recorded data was encoded into SPSS for further analysis. This study examined age, education level, size of land holding, source of income, area under cultivation, type of crops cultivated, income level, and farming experience as demographic characteristics, which were also treated as independent variables. The relationship between socio-economic factors and factors affecting the entrepreneurial competencies was found by using Pearson correlation

technique. The demographic attributes were considered as independent variables and agricultural entrepreneurial competencies that already has measured as a part of PhD research work were considered as dependent variable.

Results :

The Pearson correlation coefficient is employed to investigate the relationship between socio-economic factors and the factors influencing agricultural entrepreneurial competencies. By calculating the Pearson correlation coefficient, researcher can assess the strength and direction of the linear association between these continuous variables (Schober et al., 2018). The socio-economic factors such as education level, income level, and access to resources were considered as independent while the possessed entrepreneurial competencies regarding each entrepreneurial domain was considered as dependent variable.

The correlation analysis allows to identify whether there is a significant association between the socio-economic factors and agricultural entrepreneurial competencies. A positive correlation coefficient suggests that an increase in one variable is associated with an increase in the other, while a negative correlation coefficient would indicate an inverse relationship. The numerical value of the correlation coefficient, ranging front -1 to +1, quantifies the strength of the relationship. A coefficient close to +1 or -1 signifies a strong correlation, whereas a value close to 0 implies a weak or no linear relationship.

Table **4.29: Pearson** correlation between **socio-economic** anal **factors affecting agricultural** entrepreneurial **competencies**

Socio-economic characteristics	Pearson **correlation** coefficient	p-value
Age	.017	.472”‘
Educational level	.407°”	.000**
Size of land holding	.287°”	.000**
Annual income	.428	.000**
Experience	.198	.000**
Hindering factors towards agricultu	**al entrepreneurship**	
Social factors	-.391°	.000**
Personal Factor	-.462	.000**

Financial Factors	-.400”	.000**
Institutional Factors	-.415’"	.000**
Political factors	-.273’"	.000**
Environmental factors	-.355’"	.000**

Dependent variable: Agricultural Entrepreneurial competencies

Age: The correlation coefficient is 0.017 indicating a non-significant linear relationship between age and agricultural entrepreneurial competencies. It means there is no relationship between age and agricultural entrepreneurial competencies.

Education: The correlation coefficient (r = 0.407) shows a strong positive relationship between education and agricultural entrepreneurial competencies. This means that as the educational level increases, the competencies in agricultural entrepreneurship tend to improve.

Size of land holdings: The correlation coefficient (0.287) indicates a highly significant and positive relationship between size of land holdings and agricultural entrepreneurial competencies. Larger land holdings may be associated with higher competencies in agricultural entrepreneurship.

Annual income: The correlation coefficient (0.428) indicates a moderately strong positive correlation between annual income and agricultural entrepreneurial competencies. Higher annual income might be linked to better competencies in agricultural entrepreneurship.

Framing Experience: The correlation coefficient (r = 0.198) confirmed a positive and significant correlation between the respondents' experience and agricultural entrepreneurial competencies. It means, more experience may be associated with slightly higher competencies in agricultural entrepreneurship.

Social factors: The correlation coefficient (-0.391), indicates a moderately strong negative correlation between social factors and agricultural entrepreneurial competencies. This suggests that certain social factors may hinder entrepreneurial competencies in agriculture.

Personal factors: The correlation coefficient is (r = -0.462), showing a moderately strong negative correlation between personal factors and agricultural entrepreneurial competencies. Certain personal factors may act as barriers to entrepreneurial competencies in agriculture.

Financial factors: The correlation coefficient (r =-0.400) indicates a moderately strong negative correlation between financial factors and agricultural entrepreneurial competencies. Financial difficulties may hinder competencies in agricultural entrepreneurship.

Institutional factors: The correlation coefficient (r =-0.415) shows a strong negative correlation between institutional factors and agricultural entrepreneurial competencies. Certain institutional barriers may impede entrepreneurial competencies in agriculture.

Political factors: The correlation coefficient (r = -0.273) shows a moderate negative correlation between political factors and agricultural entrepreneurial competencies. Political influences may affect competencies in agricultural entrepreneurship.

Environmental factors: The correlation coefficient (r = -0 355) indicates a moderately strong negative correlation between environmental factors and agricultural entrepreneurial competencies. Environmental challenges may hinder competencies in agricultural entrepreneurship.

Multiple Linear Regression (MLR) test for testing of association between dependent and independent variables:

Multiple Linear Regression (MLR) is a highly valuable statistical technique in research for its ability to explore complex relationships between a dependent variable and multiple independent variables simultaneously (Kurnari and Yadav, 2018). Researchers use MLR to uncover significant predictors that influence the outcome of interest (Shrestha, 2020), aiding in the identification of influential factors and their respective effects (Liu et a1., 2020). By including confounding variables as predictors in the model, MLR allows researchers to control for potential confounders, enabling a more accurate assessment of the specific impact of the variables under study (Pei et a1., 2019). Moreover, MLR serves predictive and forecasting purposes, facilitating future outcome projections based on existing data (Siami et a1., 2019). Through the regression coefficients, researchers gain insights into the strength and direction of relationships between variables (Schober et a1., 2018). MLR enables hypothesis testing, fostering evidence-based conclusions and supporting data-driven decision-making processes. Additionally, it finds application in experimental research to evaluate intervention effects and assess treatment effectiveness (Busk and Serlin, 2015). The identification of important independent variables aids in resource allocation and decision-making. Model validation ensures reliability and accuracy in drawing insights and making predictions.

Table 4.30: Multiple Linear Regression (MLR) Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.759[a]	.577	.?64	.47344

a. Predictors: (Constant), experience, annual income, age, size of land holding, Political factors, educational level, Personal Factor, Social factors, Institutional Factors, Financial Factors, Environmental factors

R: The multiple correlation coefficient or multiple R is a measure of the strength and direction of the linear relationship between the dependent variable (Entrepreneurial Competencies) and all the independent variables (predictors) taken together. In this case, the multiple correlation coefficient (R) is 0.7ñ9, indicating a moderately strong positive relationship between the predictors and the dependent variable.

R Square (R^2): The coefficient of determination, or R^2, represents the proportion of the variance in the dependent variable that the independent variables in the model can explain. In this case, R^2 is 0.577, which means approximately 57.7% of the variance in Entrepreneurial Competencies can be explained by the included predictors.

Relationship of different hindering factors related with entrepreneurial **competencies**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.685[a]	.470	.461	.32639

a. Predictors: (Constant), Environmental factors, Personal Factor, Social factors, Financial Factors, Political factors, Institutional Factors

Table **4.34: Relationship of different hindering factors** with entrepreneurial competencies

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.106	.134		30.?8?	.000

Social factors	-.280	.036	-.299	-7.780	.000
Personal Factor	-.363	.041	-.352	-8.841	.000
Financial Factors	-.225	.042	-.233	-5.389	.000
Institutional Factors	-.099	.043	-.105	-2.306	.022
Political factors	.021	.044	.021	.484	.628
Environmental factors	-.176	.048	–.166	-3.642	.000

a. Dependent Variable: Entrepreneurial Competencies

Model Overview

- **Dependent** 1 amiable: Entrepreneurial competencies
- Independent Variables: Social factors, Personal factors, Financial factors, Institutional factors, Political factors, Environmental factors

Coefficients Explanation

- **Unstandarilizeil Coefficients (B):** These represent the change in the dependent variable for a one-unit change in the independent variable, while holding all other independent variables constant.
- Stanilardized Coefficients **(Beta):** These allow for comparison across different independent variables by standardizing them. They indicate the relative importance of each independent variable in predicting the dependent variable.
- **Stanilard Error (Std.** Error): This measures the variability or uncertainty of the coefficient estimates.
- t-value: Used to determine the significance of the coefficients.
- Sig. (p-value): Indicates whether the relationship between the independent variable and the dependent variable is statistically significant.

Interpretation of Each Factor

1. **Constant:** The intercept or constant term is 4.106, meaning that if all independent variables were zero, the predicted value of entrepreneurial competencies would be 4.106. This is statistically significant.

2. Social **Factors:**
    - B = -0.280: For every one-unit increase in social factors, entrepreneurial competencies decrease by 0.280 units.
    - **Beta** = **-0.299:** Social factors have a moderate negative impact on entrepreneurial competencies.
    - Sig. = 0.000: This relationship is statistically significant.
3. Personal Factors:
    - B = -0.363: For every one-unit increase in personal factors, entrepreneurial competencies decrease by 0.363 units.
    - **Beta** = **-0.3ii2:** Personal factors have a moderate to strong negative impact on entrepreneurial competencies.
    - Sig. = 0.000: This relationship is statistically significant.
4. **Financial** Factors:
    - B = **-0.225:** For every one-unit increase in financial factors, entrepreneurial competencies decrease by 0.225 units.
    - **Beta** = **-0.233:** Financial factors have a moderate negative impact on entrepreneurial conipetencies.
    - Sig. = 0.000: This relationship is statistically significant.
5. **Institutional Factors:**
    - B = -0.099: For every one-unit increase in institutional factors, entrepreneurial competencies decrease by 0.099 units.
    - **Beta** = -0.10ii: Institutional factors have a small negative impact on entrepreneurial competencies.T
    - **Sig.** = **0.022:** This relationship is statistically significant.
6. Political Factors:
    - B = **0.021:** For every one-unit increase in political factors, entrepreneurial competencies increase by 0.021 units.
    - **Beta** = **0.021:** Political factors have a very small positive impact on entrepreneurial competencies.

- **Sig.** = **0.628:** This relationship is not statistically significant.

7. **Environmental Factors:**

    - B = -0.176: For every one-unit increase in environmental factors, entrepreneurial competencies decrease by 0.176 units.
    - **Beta** = -0.166: Environmental factors have a small to moderate negative impact on entrepreneurial competencies.
    - **Sig.** = 0.000: This relationship is statistically significant.

Conclusion:

The correlation analysis identified that there is a significant association between the socioeconomic factors and agricultural competencies. Among the demographic characters age has a non-significant relationship with entrepreneurial competencies. Educational level, size of landholding, annual income and farming experience have significant positive relationship with entrepreneurial competencies. The coefficient correlation associated with hindering factors confirmed a strong negative correlation of social factors (-0.391), personal factors (-0.46), financial factors (-0.40), institutional factors (-0.41), political factors (-0.273) and environmental factors (-0.35a) with entrepreneurial competencies. This confirms that in the presence of mentioned hindering factors entrepreneurial intensions of famers are being affecting and they are still unable to revolutionize their faming systems. Multiple linear regression model was employed to quantify the strength of relationship between dependent and independent variables. Personal factors such as decision-making power, awareness and fear of conflict etc. were majorly influencing negatively with beta value (-0.363) followed by social factors beta value (-0.280) and financial factors beta (-0.22).

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