Factors Affecting Private Investment into High-Tech Agriculture in Kon Tum Province

Nguyen, Thi Hoa  
Lecturer, Department of Economic Faculty,  
The University of Danang-Campus in Kontum, Kon tum, Vietnam

Phan, Thi Thanh Truc  
Lecturer, Department of Economic Faculty,  
The University of Danang-Campus in Kontum, Kon tum, Vietnam

Nguyen, Thi Hang  
Lecturer, Department of Economic Faculty,  
The University of Danang-Campus in Kontum, Kon tum, Vietnam

Abstract:  
Kon Tum is a province with favorable natural conditions for high-tech agriculture development. However, its number of investors is currently very small. This paper focuses on analyzing the factors affecting the attraction of private investment in this sector in Kon Tum province. The study surveyed 306 investors inside and outside the province, and the data were analysed using the EFA method. The findings showed that the factors affecting the attraction of private investors in Kon Tum include natural conditions, infrastructure, human resources and land policies. Therefore, the province needs to build and improve its infrastructure, enhance its quality of human resources, clarify its land policies and transparentize tenancy duration and related procedures. These solutions help attract private investors in this sector.

Keywords: Private investment, high-tech agriculture, kon tum province

1. Introduction  
Kon Tum is one of the five provinces of the Central Highlands, Vietnam, with many potential advantages of soil for developing high-value agricultural products. Agriculture is its major production sector and the livelihood of approximately 72% of its population, contributing to nearly 45% of its total budget revenue. However, Kon Tum's agricultural production still plays a minor role and has limited contribution to its attempt on income generation and poverty alleviation. Precisely, by the end of 2017, its poverty rate was still high, approximately 20.03%, which was far higher than the national average. In addition, the majority of its people in poverty are ethnic minorities and those who live on agricultural production. This reality put high requirements on a strategy to restructure the agricultural sector to increase productivity and efficiency, contribute to raising incomes and reduce poverty for the majority of local people.

To deal with this situation, in recent years, the People’s Committee of Kon Tum province has identified high-tech agriculture as a new direction in improving its people’s living standard and alleviating poverty. In 2016, this Committee approved the project "Developing hi-tech agriculture accompanied by processing", in which Kon Tum’s proportion of hi-tech agricultural production till 2020 is expected to reach 10% - 15% of its total agricultural output, with at least 05 regions and 02 agricultural zones applying high technologies. By 2030, this proportion is expected to reach 25% - 30%. To reach these goals, forming agricultural production methods in which advanced science and technologies are applied to create mass commodity production with high productivity, quality, efficiency and competitiveness is mandatory.

However, the latest report shows that what enterprises and investors contribute to Kon Tum’s development of high-tech agricultural production has been just stopped at the level of inquiry. This practice shows that investing in high-tech agriculture in Kon Tum faces many potential difficulties, and its policies have not been really effective, met investors and enterprises’ expectations and supported them. These facts put great demands on scientific and practical research to find out policy solutions which can attract enterprises and investors to engage in high-tech agricultural production in Kon Tum province.

This paper aims to examine and assess the factors which are likely to impact on attracting private-sector investment in high-tech agriculture in Kon Tum province, from which recommendations and solutions to deal with the above problem will be provided.

2. Literature Review and Hypothesis Development  
Currently, numerous studies focus on analyzing the factors affecting private investment in agriculture. Due to contextual constraints, only a small number of studies which are highly relevant to agricultural development in developing countries like Vietnam are reviewed.
Gao et al. (2017) examined the impact of land policies on motivations for agricultural investment in China. They pointed out that transparency and clarity relating to land use duration and rights play key roles in an enterprise’s investment decisions. Similarly, Petracco and Pender’s study on investment motives in agriculture in Uganda (2009) showed that land use duration plays an important role in investors’ financial access. Bathla and Kumari (2017) examined the role of financial access, infrastructure investment, and the quality of human resources in private investment in agriculture in India. They found that the development of rural financial markets, infrastructure and human resources increased the probability of private investment in agriculture. Kwanmuang and Kanjana (2014), who investigated rural households’ investment motives in Thailand, revealed that effective investment policies of the local authority increased investment in infrastructure, technical training programs and technology transfer, and land policies encouraged household investment in agriculture. OECD (2013) released the OECD framework for policy analysis on agricultural investment, which assists the assessment and design of policies to attract private investment in agriculture. This framework aims at sustainable economic development and covers various factors, including investment policies, investment promotion, infrastructure development, commercial policies, financial sector development; human resources, research and innovation, tax policies, risk management; social responsibility and business environment.

In Vietnam, Dong (2016), whose research assessed the situation of attracting investment capital into the agricultural sector in Gia Lai province, indicated that the local government’s policies were backward and less supportive; its incentives for businesses were modest; and its financial mechanism was not transparent and clear. Basing on this research, he recommends that Gia Lai should focus on finalize its agricultural planning, developed investment attraction policies for each capital source, and promote policies to attract capital for agriculture advertising, investment promotion, investment support in agriculture such as administrative reform and land incentive policies. Besides, in the work titled ‘Solutions to encourage investment in agricultural development in Luong Son district, Hoa Binh’, Luu Thi Thao and Ho Thi Xuan Hong (2017) used the EFA method to identify the factors which impact on investors’ investment willingness. They found that F1 (investment policy) is ranked top, followed by F3 (infrastructure) and F4 (human resources).

Minh Huong (2015) proposed solutions to attract enterprises to invest in the agricultural sector, including creating land funds, transforming the disbursement mechanism into the value-based advance mechanism, completing tax and credit policies, and investing in irrigation infrastructure.

Loan et al. (2010) examined the factors affecting investment attraction in agriculture in Hanoi, including land policies, labor, financial access, investment attraction policies, infrastructure, markets, and technology. Their survey results show that land policies and management policies were the biggest barriers to investment attraction in agriculture in Hanoi, followed by capital, infrastructure, and technology. Duong (2015) studied the factors affecting investment attraction in agriculture in Bac Ninh province. He pointed out that Bac Ninh had many factors demotivating enterprises to invest in agriculture, including land policies, investment attraction policies, credit policies, risks of agricultural market, small-scaled agricultural development and weak planning.

Based on the OECD model and the analysis of other models applied in both domestic and international contexts, this research utilizes an integrated model which consists of 8 factors: natural conditions; infrastructure; incentive policies and regimes; advantages of invested industries; human resources; competitive input costs; business environment and land policies.

![Figure 1: Research Model of Factors Affecting Investment Attraction in Hi-Tech Agriculture](image_url)

Research Variables and Hypotheses Are Presented Below:
2.1. Natural Conditions

Natural conditions are the basic factor in agricultural development. Natural conditions, which include a geographical location advantageous to agriculture, forestry and fisheries; soil and climate, etc., affect the efficiency of agricultural production (Ntwala, 2003; Obazuage, 2007; Tyler and Miranda, 2007; Youli and Jian, 2009). Studies show that this factor affects investment attraction. Therefore, we hypothesized that:

- H1: Natural conditions affect the attraction of private investment in high-tech agriculture directly and in the same direction.

2.2. Infrastructure

Infrastructure (including basic infrastructure such as electricity, water, transportation, premises and technical infrastructure like communication and banking systems, etc.) is one of the factors which greatly influences an enterprise's production and business (Dunning, 1977; Lucia, 1988; Thao & Hong, 2017). Studies have shown that infrastructure is a factor that has an impact on the investor's attraction. Therefore, we hypothesized that:

- H2: Infrastructure impacts on the investor’s attraction in the same direction

2.3. Investment Policy Regimes

Investment policy regimes are reflected in the local government’s policies on incentives for investment; its dynamism in supporting investment enterprises in terms of administrative, legal and tax procedures; and its clear and transparent documents and policies which are quickly reached enterprises so that public officials cannot profiteer or harass enterprises (Thao & Hong, 2017; Huong, 2015; OECD, 2013). Therefore, we hypothesized that:

- H3: Investment policy regimes impact on the investor’s attraction in the same direction

2.4. Advantages of Invested Industries

Businesses invest in localities to take advantage of invested industries. These advantages are the adjacency to main raw material sources, consumption markets and business partners to reduce transportation costs, increase connectivity or competitiveness with main competitors to maintain presence and gain market shares (OECD, 2013). Therefore, we hypothesized that:

- H4: Advantages of invested industries affect the investor’s attraction in the same direction

2.5. Human Resources

Human resources are an important factor that an enterprise must consider in its decision to invest in a locality. High-tech enterprises prefer an abundant and cheap human resource which has skilled and disciplined labor appropriate to industrial production chains and especially managerial and technical workers owning foreign language skills to work with foreign-invested partners (OECD, 2013; Loan et al, 2010; Thao & Hong, 2017). A locality with an abundant and diverse human resource is always an attractive destination for businesses to invest. Therefore, we hypothesized that:

- H5: Human resources affect the investor’s attraction in the same direction.

2.6. Competitive Input Costs

Competitive input costs are the basic factor directly relating to the investment efficiency of an enterprise. Enterprises can increase their competitiveness or gain higher profits when their input costs are low. Competitive costs could generate reasonable prices accompanied by a guarantee of the quality of products and services (OECD, 2013). The literature review shows that competitive input costs are an important factor affecting the investor's attraction. We put forward the hypothesis H6 as follows:

H6: Competitive input costs affect the investor’s attraction in the same direction

2.7. Business Environment

A locality with public services of good quality allows investors to comply with the government's policies easily, save time and cost of solving necessary administrative procedures relating to investment and production and business activities, and benefit from the State’s support in the areas where the State has advantages but enterprises face difficulties to access (OECD, 2013; Dong, 2016). Therefore, the hypothesis H7 is as follows:

- H7: Business environment affects the attraction of private investment in high-tech agriculture directly and in the same direction.

2.8. Land Policies

Land is of great importance to agricultural development. Investors are assured of clear, transparent land policies and simple procedures (Liangliang, Sun, & Huang, 2017; Dong, 2016; Duong, 2015; OECD, 2013) Therefore, we hypothesized that:

- H8: Competitive land policies affect the attraction of private investment in high-tech agriculture directly and in the same direction.
2.9. Investors' Attraction

Investors will pour their investment capital in production and business activities which they feel favorable and progressive as desired. The effectiveness of investment activities determines the investor's investment decision. Investors who decide to invest in a locality tend to continue investing in production and business in the long term and introduce the locality to other investors.

3. Research Methodology

This study is both qualitative and quantitative. The qualitative research was conducted through 01 group discussion with 11 respondents who are direct investors in Kon Tum province and officials of Kon Tum Department of Agriculture and Rural Development, and it was used to adjust the scales of the research model to suit the conditions in Kon Tum province. The official study employed a quantitative approach and used the stratified and convenience sampling method. Printed and online questionnaires (with Google Docs) were sent out to 306 respondents who are enterprises inside and outside the province to collect data to test the model and research hypotheses.

The sample consists of 306 units belonging to 3 sectors of the economy: Sector I (Agriculture - forestry - fishery) accounted for 45.5%, Sector II (Industry - construction) accounted for 32%, and Sector III (Trade - services) accounted for 22.5%. The number of enterprises outside the province occupies 61.1%, and those inside the province accounts for 38.9%.

| Location       | Number | %   |
|----------------|--------|-----|
| Overseas       | 0      | 0   |
| Inside the province | 119   | 38.9 |
| Outside the province | 187   | 61.1 |
| Total          | 306    | 100 |

| Sector                      | Number | %   |
|-----------------------------|--------|-----|
| Agriculture, forestry, fishery | 139    | 45.5|
| Industry, construction      | 98     | 32.0|
| Trade, services             | 69     | 22.5|
| Total                       | 306    | 100 |

Table 1: Descriptive Statistics of the Sample

4. Results and Discussions

4.1. Exploratory Factor Analysis

The reliability of scales (variables) is assessed by Cronbach’s alpha. Cronbach’s alpha coefficients are first used to eliminate inappropriate variables. Hoang Trong Chu and Chu Thi Mong Ngoc (2008) pointed out that the measurement scales with Cronbach’s alpha from 0.8 to nearly 1 are good and those from 0.7 to nearly 0.8 are usable. In addition, the correlation of the total variables is also considered, and only those variables with a coefficient greater than 0.3 are retained. The Cronbach's alpha analysis shows that the variables INF3 and IPR5 have the correlation coefficients with total variables of 0.290 and 0.1135 respectively, so these two variables are excluded.

| Code | Names of the observed variables                                           | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach’s Alpha if Item Deleted |
|------|--------------------------------------------------------------------------|---------------------------|-------------------------------|----------------------------------|----------------------------------|
| NCO1 | Kon Tum has a favorable position for developing agriculture               | 13.8039                   | 9.876                         | 0.649                            | 0.826                            |
| NCO2 | Kon Tum has a favorable position for developing aquaculture              | 13.8889                   | 9.765                         | 0.667                            | 0.821                            |
| NCO3 | Spacious land is appropriate to developing high-tech agriculture         | 14.0523                   | 9.61                          | 0.723                            | 0.806                            |
| NCO4 | Soil is suitable for growing industrial crops                            | 13.9118                   | 9.858                         | 0.703                            | 0.812                            |
| NCO5 | Climatic conditions are favorable                                        | 14.0425                   | 10.487                        | 0.58                             | 0.843                            |

Natural conditions (NCO): Cronbach’s Alpha = .852

| INF1 | The electric power supply system is adequate                             | 12.7843                   | 10.812                        | 0.741                            | 0.827                            |
| INF2 | The water supply and drainage system are adequate                        | 12.6732                   | 10.208                        | 0.794                            | 0.813                            |
| INF4 | Transportation is convenient (time and costs)                            | 12.8268                   | 11.258                        | 0.685                            | 0.841                            |
| INF5 | Premises are adequate                                                   | 12.8725                   | 12.118                        | 0.481                            | 0.889                            |
| INF6 | The banking system is adequate                                           | 12.5948                   | 10.275                        | 0.769                            | 0.819                            |

Infrastructure (INF): Cronbach’s Alpha = .868
The assessment of the reliability of scales shows that Cronbach’s alpha 0.852 is for Natural condition (NCO); 0.868 for Infrastructure’s (INF); 0.747 for investment incentive policies (IPR); 0.955 for advantages of invested industries (AII); 0.868 for human resources (HR); 0.752 for competitive input costs (CIC); 0.859 for business environment (BE) and 0.856 for land policies (LP). The dependent variables of private investment attraction (PIA) receive Cronbach’s Alpha of 0.833.
is clearly seen that the correlation coefficient of observed variables with the scales is high, above 0.6. This shows that the observed variables have a good correlation with the overall scale. The Cronbach’s alpha coefficients of the scales are all above 0.7; therefore, the scales for official surveys are reliable. The variables listed in Table 2 will be analysed using the EFA.

Hair & al. (1998, 111) point out that the factor loading is an indicator to assure the practical significance of the EFA. Factor loadings> 0.3 means minimum statistical significance; Factor loadings> 0.4 are considered important; and factor loadings> 0.5 is a crucial condition for the EFA to function. After eliminating ineligible variables INF5, HR4, BE1 and LP3 owing to their loading factors lower than 0.5, the results of factor analysis of independent components are as follows:

| Component | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| NCO1      | .776|     |     |     |     |     |     |     |
| NCO2      | .773|     |     |     |     |     |     |     |
| NCO3      | .741|     |     |     |     |     |     |     |
| NCO4      | .797|     |     |     |     |     |     |     |
| NCO5      | .590|     |     |     |     |     |     |     |
| INF1      |     | .862|     |     |     |     |     |     |
| INF2      |     | .783|     |     |     |     |     |     |
| INF4      |     | .862|     |     |     |     |     |     |
| INF6      |     | .779|     |     |     |     |     |     |
| IPR1      |     |     | .716|     |     |     |     |     |
| IPR2      |     |     | .813|     |     |     |     |     |
| IPR3      |     |     | .742|     |     |     |     |     |
| IPR4      |     |     | .685|     |     |     |     |     |
| AII1      |     |     | .867|     |     |     |     |     |
| AII2      |     |     | .870|     |     |     |     |     |
| AII3      |     |     | .850|     |     |     |     |     |
| HR1       |     | .901|     |     |     |     |     |     |
| HR2       |     | .893|     |     |     |     |     |     |
| HR3       |     | .891|     |     |     |     |     |     |
| CIC1      |     |     | .860|     |     |     |     |     |
| CIC2      |     |     | .823|     |     |     |     |     |
| CIC3      |     |     | .758|     |     |     |     |     |
| CIC4      |     |     | .551|     |     |     |     |     |
| BE2       |     | .941|     |     |     |     |     |     |
| BE3       |     | .927|     |     |     |     |     |     |
| BE4       |     | .513|     |     |     |     |     |     |
| BE5       |     | .913|     |     |     |     |     |     |
| LP1       |     |     | .871|     |     |     |     |     |
| LP2       |     |     | .852|     |     |     |     |     |
| LP4       |     |     | .704|     |     |     |     |     |
| KMO       |     |     | .793|     |     |     |     |     |

| Bartlett’s Test of Sphericity | Approx. Chi-Square | df | Sig. |
|-------------------------------|--------------------|----|------|
|                               | 7141.227           | 435| .000 |

Table 3: Results of Independent Component Analysis

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
a. Rotation converged in 6 iterations

The EFA results of factors affecting the investor’s attraction presented in Table 3 show that 33 observed variables used to measure research concepts were drawn into 8 factors with the Cumulative of Variance of 74.676% and the Eigenvalue of 2,395. The KMO coefficient of 0.793 with a statistical significance level of 0,000 suggests that the independent component analysis is appropriate.

The analysis result includes 8 groups as follows: F1 (Natural conditions); F2 (Business environment); F3 (Infrastructure); F4 (Human resources); F5 (Investment advantages); F6 (Land policies); F7 (Competitive input costs) and F8 (Investment policies).

The new dependent variable is coded PIA and its KMO coefficient of 0.764 with the Cumulative of Variance of 67.31% and the Eigenvalue of 2,692 indicates the analysis of the dependent variable is appropriate. The assessment of the correlation between dependent and independent variables shows that the variable F7 and PIA have Sig. 0.248, which is not statistically significant. Therefore, the variable F7 is excluded when the regression analysis is conducted and research hypotheses are tested.
Testing Regression Models and Research Hypotheses

The research results show that the adjusted R² is 0.513. Thus, 51.3% of the change in attracting investors is explained by the independent variables. The testing results are presented in Table 4.

| Model | R   | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-----|----------|-------------------|---------------------------|
| 1     | .653a | .527     | .513              | .59702                    |

Table 4: Model Summaryb

a. Predictors: (Constant), F8, F2, F3, F5, F1, F4, F6
b. Dependent Variable: PIA

4.2. The Appropriacy of the Model

The testing result shows that the significance level is less than 0.05. Therefore, it can be concluded that the given model is suitable for the collected data. In other words, the independent variables are linearly correlated with the dependent variables with the significance level of 5% and a 95% confidence level. The result is shown in Table 5.

| Model | Sum of Squares | df | Mean Square | F  | Sig. |
|-------|----------------|----|-------------|----|------|
| 1     | Regression     | 7  | 10.662      | 29.913 | .000b |
|       | Residual       | 281| .356        |     |      |
|       | Total          | 288|             |     |      |

Table 5: Results of ANOVAa

a. Dependent Variable: PIA
b. Predictors: (Constant), F8, F2, F3, F5, F1, F4, F6

The test results of the research hypotheses presented in Table 6 show that 4 hypotheses are accepted at the significance level of 5% and a 95% confidence level.

| Coefficientsa | Model | Unstandardized Coefficients | Standardized Coefficients | t    | Sig. |
|---------------|-------|-----------------------------|---------------------------|------|------|
|               |       | B                           | Std. Error                | Beta |      |
| 1             | (Constant) | .480                       | .260                      | 1.847 | .066 |
|               | F1    | .274                        | .056                      | .270  | 4.869 | .000 |
|               | F2    | -.068                       | .052                      | -.069 | -1.317 | .189 |
|               | F3    | .208                        | .047                      | .234  | 4.468 | .000 |
|               | F4    | .144                        | .053                      | .148  | 2.731 | .007 |
|               | F5    | .066                        | .049                      | .071  | 1.360 | .175 |
|               | F6    | .193                        | .053                      | .205  | 3.637 | .000 |
|               | F8    | .021                        | .052                      | .019  | .396  | .692 |

Table 6: Test Results of Research Hypotheses

a. Dependent Variable: PIA

Table 6 shows that constants and the variables F2, F5 and F8 have Sig.>0.05, which is not statistically significant with the significance level of 95%

5. Conclusions and Recommendations

High-tech agriculture is a new direction which brings many prospects for agriculture and economic growth in Kon Tum province. However, investing in this field faces risks and difficulties, especially in a poor province like Kon Tum. Therefore, to attract investment in high-tech agriculture in Kon Tum, we propose the following recommendations:

Firstly, high-tech agriculture requires big investment capital and long-term investment, so whether natural conditions are favourable or not is extremely crucial for investors. Therefore, the local government needs to have accurate information soil and appropriate forms of agriculture to introduce to and persuade investors.

Secondly, Kon Tum’s infrastructure in terms of electricity, water and transportation as well is still inadequate despite its recent improvement. Therefore, it is of necessity for the province to have specific plans for developing and improve its infrastructure.

Thirdly, human resources are the factors to which investors pay much attention before their investment decisions. Local raining institutions, therefore, need to renovate their training programs so that they become more practical.
addition, local enterprises should create conditions for these schools’ students to access to a real working environment and their current equipment and technologies. Local enterprises, schools and foreign language centers should be closely connected so that workers have opportunities to improve foreign language skills. This will enable them to access to latest documents and managerial processes and to use modern equipment and technologies. Finally, the local government needs to have clear and transparent land policies, simplify administrative procedures and clarify tenancy duration.

6. Acknowledgements

This research is funded by Foundation for Science and Technology Development of Danang University under grant number “B2018-DN08-07”

7. References

i. Dong, N. K. (2016). Attracting Investment Capital into the Agricultural Sector in Gia Lai Province, Unpublished master's thesis.

ii. Duong, N. X. (2015). Attracting enterprises’ investment into agriculture in Bac Ninh province. Unpublished doctoral dissertation. Ho Chi Minh National Academy of Politics.

iii. Ho, D. P. (2011). Quantitative research methods and practical studies in Development economics – Agriculture), Phuong Dong Publishing House, pp.67 - 91.

iv. Thao, L. T and Hong, H. T. X. (2017). Solutions to encourage investment in agricultural development in Luong Son district, Hoa Binh), Journal of Forestry Science and Technology, 1-2017, pp.160-168.

v. Huong, H. (2015). Proposing solutions to attract enterprises’ investment in the agricultural sector.

vi. Loan. C. T. (2010). Evaluating the investment environment in Hanoi’s agriculture sector - Perspective from production and business units). Journal of Science and Development. 8, 1(8), pp.157-169.

vii. Gao, L., Sun, D., and Huang, J. (2017). Impact of land tenure policy on agricultural investments in China: Evidence from a panel data study. Journal of China Economic, 244-252.

viii. Petracco, C. K. and Pender, J. (2009). Evaluating the impact of land tenure and titling on access to credit in Uganda. International Food Policy Research papers 853.

ix. Bathla, S and Kumari, Y. (2017). Changing Contours of Indian Agriculture Investment, Income and Non-farm Employment. Springer Singapore.

x. Kwanmuang, K. (2014). Factors Influencing Farm Investment Planning—A Case Study in Nakhon Si Thammarat Province, Thailand. Journal of Developments in Sustainable Agriculture, 9(1), 51-55.

xi. Dunning, J. H. (1977). Trade, location of economic activity and the MNE: A search for an eclectic approach. In: B. Ohlin et al. (Eds.). The International Allocation of Economic Activity, 395 – 418.

xii. Lucia, R. E. (1988). On the Mechanics of Economic Development’. Journal of Monetary Economics, 22(1), 3-42.