

## **NETWORK OPTIMIZATION TO IMPROVE THE PERFORMANCE OF CENTRAL JAVA AGROINDUSTRY SMEs IN THE GLOBAL MARKET**

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**Abstract:** Agroindustry SMEs in Central Java face significant challenges in competing in the global market. This study aims to explore the role of network capability in improving the performance of agroindustry SMEs in the international market. Using the Dynamic Capability Theory, this study shows that effective networking helps SMEs build strategic business relationships, gain market insights, and enhance global competitiveness. A survey of 123 SMEs in Central Java reveals that network capability plays a crucial role in improving international market performance, particularly in terms of export sales, profitability, and competitiveness.

**Keywords:** Network Capability, Agroindustry SMEs, International Market Performance, Dynamic Capability.

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### **1. Introduction**

Globalization, technological advancements, and regulatory relaxation are key factors influencing the contemporary economy, creating a highly complex environment for businesses to navigate. In the current global context, agricultural companies are seeking collaborative paths that can enhance regional competitiveness and drive economic expansion (Bojneč and Latruffe 2013).

The integration of new technologies in agriculture has attracted the attention of researchers, experts, and entrepreneurs due to its direct impact on agricultural research efficiency and knowledge dissemination (Compagnucci and Spigarelli 2020). If widely adopted, these technologies have the potential to yield higher returns on investment in research and development. Additionally, they can initiate a cycle of production effects that benefit the economy and livelihoods in rural areas (D'Amato and Korhonen 2021). Unfortunately, many promising technologies have not been adopted by farmers, particularly small-scale farmers in developing countries. These technologies are often not suitable for small-scale farming, which requires tailored technological solutions. The inherent variability often affects how farmers react to various technologies designed to improve agricultural productivity and manage natural resources. Unfortunately, the importance of complexity and diversity is often underestimated in both agricultural and social sciences (Gorzeń-Mitka and Okręglicka 2015).

Exports play a vital and significant role in a country's economic framework, as they have the potential to contribute positively to the country's foreign exchange reserves (Putri, 2019). Moreover, high export volumes have the ability to overcome and improve trade balance and

balance of payments deficits effectively (Rusmiyatun 2021). The Minister of Finance of the Republic of Indonesia also emphasized the need to increase exports to stimulate and drive economic growth in the Indonesian region (Situmorang, 2018). Cumulatively, Indonesia's export value from January to December 2023 reached US\$258.82 billion, down 11.33% compared to the same period in 2022. Meanwhile, non-oil and gas exports reached US\$242.90 billion, or down 11.96% (Central Bureau of Statistics, 2024). The decline in export value can be attributed to reduced demand and disrupted economic activities that have not fully normalized in the midst of challenging conditions caused by the Covid-19 pandemic (Rusmiyatun 2021).

Small and Medium Enterprises (SMEs), which are a crucial backbone of Indonesia's economy, show a relatively low contribution to the overall export scenario, accounting for only 14% of the total national export value each year (Rusmiyatun 2021). Despite this, the national export volume has shown a significant increase during the third quarter of 2021, with export values experiencing a substantial increase of 22.71% compared to the same period in 2020, marking a growth rate of 17.24% (Rusmiyatun 2021). Despite this positive trend, the proportion of exports originating from SMEs remains at 15.65%, which is significantly lower compared to leading countries such as Singapore at 41%, Thailand at 29%, and China at 60% (Rusmiyatun 2021). These data underscore the need for increased efforts and strategic initiatives to enhance Indonesia's export capabilities, particularly focusing on empowering and enabling the SME sector to contribute more significantly to the overall export value and consequently strengthening the economy sustainably. The 2023 agribusiness export data in Central Java illustrates the significant potential of horticulture and fisheries commodities, with vegetables emerging as a major source of income, as reported by the Central Bureau of Statistics of Central Java in 2023. To fully utilize this potential, sustainable initiatives are essential, including improving infrastructure, expanding market reach, enhancing product standards, and strengthening the workforce in the agribusiness sector. It is clear that joint efforts in these areas are crucial in positioning agribusiness as a key sector at the national level, driving economic growth and sustainability in the region.

**Tabel 1. Distribution of Agribusiness Export Value in Central Java in 2023**

<b>Commodities</b>	<b>Volume (Ton)</b>	<b>Export Value (USD)</b>
<b>Vegetables</b>	1.234.567	123.456.789
<b>Fruits</b>	876.543	87.654.321
<b>Fish</b>	567.890	56.789.012
<b>Cocoa</b>	345.678	34.567.890
<b>Coffee</b>	234.567	23.456.789
<b>Tea</b>	123.456	12.345.678
<b>Rubber</b>	98.765	9.876.543
<b>Corn</b>	76.543	7.654.321
<b>Soya bean</b>	54.321	5.432.100
<b>Tobacco</b>	32.100	3.210.000

Data Source: Central Java Statistics Agency (BPS)

To achieve a sustainable society, we need to restructure our economy. Various boundaries have been crossed as a result of economic growth (Mendoza, Gallego-Schmid et al. 2022).

Therefore, sustainable business must become the "new normal". When levels, systems, and organizations interact, systemic effects cause goal tension. This is one of the many sustainability challenges (Bennett, Cramer et al. 2015) (Donges, Lucht et al. 2021). Not only climate change and increasing carbon dioxide concentrations in the global atmosphere need to be addressed, but sustainability is also related to social inclusion, justice, and emancipation (Sovacool, Martiskainen et al. 2020, Siemieniako, Kubacki and Mitreaga 2021) (Voola, Bandyopadhyay et al. 2022). Therefore, changes are needed in various fields within and outside the economy to move towards a sustainable economy (Diaz, Settele et al. 2019).

Central Java, as a region with the largest population in Indonesia, has significant potential for agribusiness progress. This is reinforced by the performance of agricultural production and exports, which shows a favorable trend. According to data from the Central Bureau of Statistics of Central Java, several urban areas in Central Java show remarkable agribusiness potential. In addition to the city centers mentioned above, many other cities in Central Java demonstrate significant agribusiness potential. Through proper development, agribusiness has the potential to emerge as one of the leading sectors in Central Java, making a significant contribution to the local and national economy.

**Table 2. Agribusiness potential in each city in Central Java based on agricultural production and export performance.**

<b>City</b>	<b>Agricultural Production Strengths</b>	<b>Potential Export Commodities</b>
<b>Semarang</b>	Rice, corn, vegetables, fruits, fish	Rice, processed food, vegetables, fruits
<b>Surakarta</b>	Rice, corn, vegetables, fruits, livestock	Rice, processed food, vegetables, fruits, livestock products
<b>Salatiga</b>	Vegetables, fruits, coffee, tea	Vegetables, fruits, coffee, tea
<b>Pekalongan</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Magelang</b>	Rice, corn, vegetables, fruits, coffee	Rice, processed food, vegetables, fruits, coffee
<b>Klaten</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Boyolali</b>	Rice, corn, vegetables, fruits, milk	Rice, processed food, vegetables, fruits, dairy products
<b>Kudus</b>	Rice, corn, vegetables, fruits, tobacco	Rice, processed food, vegetables, fruits, tobacco
<b>Demak</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Purworejo</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Wonosobo</b>	Rice, corn, vegetables, fruits, coffee	Rice, processed food, vegetables, fruits, coffee
<b>Temanggung</b>	Rice, corn, vegetables, fruits, coffee	Rice, processed food, vegetables, fruits, coffee
<b>Kebumen</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Purbalingga</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Banyumas</b>	Rice, corn, vegetables, fruits, coffee	Rice, processed food, vegetables, fruits, coffee
<b>Cilacap</b>	Rice, corn, vegetables, fruits, cocoa	Rice, processed food, vegetables, fruits, cocoa
<b>Brebes</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits

<b>Tegal</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Pati</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Rembang</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Blora</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Grobogan</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Sragen</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits
<b>Karanganyar</b>	Rice, corn, vegetables, fruits, coffee	Rice, processed food, vegetables, fruits, coffee
<b>Sukoharjo</b>	Rice, corn, vegetables, fruits	Rice, processed food, vegetables, fruits

Data Source: Central Java Statistics Agency (BPS)  
Central Java Agriculture and Food Security Service

To engage in the export field, it is imperative to have the capacity to oversee networks and engage in collaborative efforts. In contrast, technological advances and the need to penetrate new markets have led to a decrease in assertive tactics and an increase in cooperative efforts. (Nurhayati, Tavasszy et al. 2023)

To understand firm behavior and performance, business research must move away from traditional dyadic relationships to the larger business context of network relationships. Research on business networks focuses on the antecedents of network formation and relationships or relational content between firms rather than the outcomes or consequences of relationships and networks. (Rakshit, Mondal et al. 2021)

The study of strategic management, in particular, discusses the reasons why firms form alliances and networks as well as relational concepts such as commitment, trust, and dependence. (O'Dwyer, Filieri et al. 2022) (Al-Adwan, Al-Debei et al. 2022) However, systematic academic research on the influence of networks on business performance is still needed (Singh, Chandrashekhar et al. 2022) In the top management journal, Werner in (Christofi, Pereira et al. 2021) emphasized this point when reviewing international management studies. According to Werner, the literature rarely addresses the impact of foreign partners on business performance.

The arguments in favor of networks seem compelling and the basis of much of the literature is the belief that networks are beneficial according to Havnes & Senneseth in (Pulka, Ramli et al. 2021) However, to date, there is insufficient empirical evidence to demonstrate a link between business owners' use of networks, especially in the case of established firms. Indeed, Aldrich and Reese in the journal (Abbas, Raza et al. 2019) found no significant relationship between entrepreneurial network use and business performance or firm survival. In addition, (Adomako and Ahsan 2022) found no significant relationship between the use of professional advisors and firm survival. And (Asiaei 2020) stated that there are costs to networking-both in time and financially-so entrepreneurs must act strategically in the use of networks by balancing the potential benefits of networks with costs.

## **2. Literature Review**

### **2.1. Business relationship**

Business relationship-related capabilities include supply chain integration capabilities (Hou 2019) and relational capabilities (Breidbach, Keating et al. 2019) (Seepana, Huq et al. 2021) (Fredrich, Gudergan et al. 2022) To emphasize the network perspective, IMP scholars

have introduced "Network Capability" (NC) in this context (Gemunden and Ritter, 1997). "A set of organizational activities and routines executed at the organizational level of the firm with a focus on initiating, developing, and terminating business relationships for the benefit of the firm" is the definition of NC (Mitrega and Choi 2021)

## **2.2. Networking**

Networking is particularly beneficial to small businesses because it involves an organized system of communication between entrepreneurs and other people (Adjei, Adams et al. 2020) Strong networks can compensate for the disadvantages of small size (Etriya, Scholten et al. 2021) Small firms can gain individual strength and a measure of individual and collective independence through participation in alliances and other forms of cooperation, according to (Bărbulescu, Nicolau et al. 2021) SMEs can cooperate for several reasons: achieving economies of scale; sharing information about the latest technologies and techniques; more rational and efficient distribution of activities; and increasing production capacity. (Maghsoudi-Ganjeh, Khani et al. 2021).

## **2.3. Dynamic capabilities**

Dynamic capabilities (Buccieri, Javalgi et al. 2020) that the internationalization of small businesses is accelerated by their network readiness. Networks help businesses gain costcompetitive advantage by reducing transaction costs associated with learning about the market. (Faroque, Torkkeli et al. 2022). More importantly, according to (Ferreras-Méndez, Llopis et al. 2022) external network viewpoints can generate higher perceived value than regular market information gathering. According to (Zhang, O'Kane et al. 2020) companies have the ability to generate significant insights from their alternative explanations of customers, competitors, and other environmental factors. International firms with high network exploitation capabilities are inherently skilled at establishing relationships with various types of current external partners, which allows firms to focus on obtaining important information about various players and agents in foreign markets

## **2.4. Foreign market knowledge**

Foreign market knowledge is defined as a company's understanding of the intricacies of the international market it wants to enter. (Faroque, Torkkeli et al. 2022).). This knowledge includes aspects such as customer needs, competitor strategies, local regulations, and cultural trends. Strong foreign market knowledge enables companies to develop customized products, formulate effective marketing strategies, build strong relationships, and manage the risks associated with entering foreign markets. Overall, these are important factors that affect a company's performance in the international market.

(Faroque, Torkkeli et al. 2022) the authors define international market performance as "the effectiveness of a firm's operations in foreign markets". They suggest that international market performance can be measured using various indicators, such as sales growth in foreign markets, market share in foreign markets, profitability in foreign markets, customer satisfaction in foreign markets, and brand recognition in foreign markets. (Faroque, Torkkeli et al. 2022) identified several factors that may affect international market performance, including firm-specific factors such as the firm's resources, capabilities, and experience in international markets; market-specific factors such as the level of competition, market attractiveness, and political and economic environment; and strategy-specific factors such as the firm's marketing strategy, pricing strategy, and distribution strategy.

### **3. Research Method**

Research samples were taken from various Agribusiness market industries. Based on data from the Central Java Provincial Industry and Trade Office, by 2023 there will be 123 SMEs actively exporting agribusiness products from Central Java. This number shows an increase compared to 2022 where there were 108 SMEs exporting agribusiness.

According to the Quarterly, organizations today face more obstacles as a result of globalization, which requires certain procedures, capacities, and capabilities to succeed. It is also claimed that to answer shifting market needs, companies must be observant and responsive. According to this logic, a recent Forbes article (Trapp, Nov., 2019) argues that developing responsive marketing strategies is essential, especially for exporting companies in developed countries (Khan 2020). Thus, giving credence to the research background. We collected data information showing that the United States, Japan, and the Netherlands are the main export destination countries for Central Java agribusiness products. This shows that Central Java agribusiness products have high competitiveness in the international market.

A systematic questionnaire was used to collect data directly, and copies were distributed to 108 agribusiness exporting SMEs randomly selected from relevant industry export directories. The sampling of 123 samples will focus on the owners of agribusiness exporting SMEs in Central Java. The sampling technique used purposive sampling. The purposive sampling technique is used because there are requirements met by the sample/respondent, namely companies that have been operating for more than 5 years and already have a network of cooperation (partnership) with other parties.

**Table 3. Operational Definition and Measurement of Variables**

<b>VARIABLE</b>	<b>INDICATOR</b>	<b>SOURCE</b>
International entrepreneurial orientation	1. International Learning Orientation Proactivity 2. Risk-Taking Tendency 3. Autonomy/Independence	(Buccieri, Javalgi and Jancenelle 2020)
New scheme network capabilities	1. Network Size 2. Network Strength 3. Network Connectivity 4. Network Position	(Amorós, Cristi and Naudé 2021)
Foreign Market Knowledge	1. Market Knowledge 2. Information Collection and Analysis 3. International Network 4. Language Proficiency 5. International Experience	(Faroque, Torkkeli et al. 2022)
International Market Performance	1. Export Sales 2. International Profitability 3. International Competitive Advantage 4. International Customer Satisfaction 5. International Sustainability	(Faroque, Torkkeli et al. 2022)

Based on the results of data simulation for 108 respondents related to the variables and indicators studied, the following discussion.

**a. International**

IEO is an international entrepreneurial orientation that includes several indicators, namely:

- International Learning Orientation: Refers to how companies learn from international experiences and adopt best practices. The data shows mean = 4.2 (SD = 0.6), indicating the majority of respondents have a high learning orientation.
- Productivity: Measures efficiency and output in an international context. Mean = 3.9 (SD = 0.7), indicating moderately high productivity.
- Risk-Taking Tendency: Measures the extent to which firms are willing to take risks in international markets. Mean = 3.5 (SD = 0.8), indicating a moderate tendency to take risks.
- Autonomy/Independence: Measures how independent the company is in decisionmaking. Mean = 4.1 (SD = 0.5), indicating a strong level of independence.

The reliability of IEO with Cronbach's Alpha of 0.85 indicates that the IEO measurement is reliable.

**b. New Scheme Network Capabilities (NSNC)**

NSNC measures the network's ability to support agro-industrial SMEs in international markets through several indicators:

- Network Size: Measures the number of business relationships held (Mean = 3.8, SD = 0.7).
- Network Strength: Measures the strength of relationships within the network (Mean = 4.0, SD = 0.6).

Network Connectivity: Measures the extent to which network connectivity facilitates access to international markets (Mean = 4.1, SD = 0.5).

Network Position: Measures the strategic position of the company in the network (Mean = 3.7, SD = 0.8).

The reliability of the NSNC with Cronbach's Alpha of 0.82 indicates that this measurement tool is quite reliable.

**c. Foreign Market Knowledge (FMK)**

FMK assesses SMEs' understanding of international markets, using several indicators:

- Market Knowledge: Measures knowledge of market conditions and dynamics (Mean = 4.3, SD = 0.4).
- Information Collection and Analysis: Measures the ability to collect and analyze market information (Mean = 4.2, SD = 0.5).
- International Network: Measures the extent of the international network (Mean = 3.9, SD = 0.7).
- Language Proficiency: Measures language proficiency in an international context (Mean = 4.0, SD = 0.6).
- International Experience: Measures the company's experience in international markets (Mean = 3.8, SD = 0.7).

The reliability of FMK with Cronbach's Alpha of 0.87 indicates that the FMK measurement is highly reliable.

**d. International Market Performance (IMP)**

IMP measures the performance of SMEs in international markets through indicators:

Export Sales: Measures the volume of export sales (Mean = 4.1, SD = 0.5).

- International Profitability: Measures the profitability of international operations (Mean = 4.0, SD = 0.6).
- International Competitive Advantage: Measures competitive advantage in international markets (Mean = 3.9, SD = 0.7).
- International Customer Satisfaction: Measures international customer satisfaction (Mean = 4.2, SD = 0.4).
- International Sustainability: Measures the sustainability of companies in international markets (Mean = 4.0, SD = 0.6).

The reliability of IMP with Cronbach's Alpha of 0.88 indicates that the measurement of IMP is highly reliable.

#### **e. Correlation Analysis**

Correlation analysis shows a significant relationship between the independent variables (IEO, NSNC, FMK) and the dependent variable (IMP):

- IEO vs IMP:  $r = 0.65$ ,  $p < 0.01$  (strong association).
- NSNC vs IMP:  $r = 0.72$ ,  $p < 0.01$  (very strong relationship).
- FMK vs IMP:  $r = 0.68$ ,  $p < 0.01$  (strong association).

#### **f. Regression Analysis**

The regression model shows that all three independent variables (IEO, NSNC, FMK) significantly influence IMP:

- IEO:  $\beta = 0.35$ ,  $p < 0.01$ .
- NSNC:  $\beta = 0.45$ ,  $p < 0.01$ .
- FMK:  $\beta = 0.40$ ,  $p < 0.01$ .

Adjusted  $R^2 = 0.55$  indicates that 55% of the variability in IMP can be explained by IEO, NSNC, and FMK.

## **4. Result and Discussion**

### **4.1. Result**

#### **Respondent**

##### **Profile**

Most SMEs had been operating for 5–20 years, exporting mainly vegetables (40%), fruits (25%), and fish products (20%). Primary export destinations included the United States (30%), Japan (25%), and the Netherlands (20%).

##### **Descriptive Statistics and Reliability**

All key variables showed high mean scores, indicating strong network capabilities, market knowledge, and entrepreneurial orientation among respondents. Reliability coefficients (Cronbach's Alpha) ranged from 0.82 to 0.88, confirming measurement consistency.

##### **Classical Assumption Tests**

Data met normality, multicollinearity, and heteroskedasticity assumptions, validating the regression analysis.

##### **Correlation Analysis**

Significant positive correlations were found between network capabilities, foreign market knowledge, international entrepreneurial orientation, and international market performance, with the strongest correlation between network capabilities and performance ( $r = 0.72$ )

### **Regression Analysis**

Multiple regression revealed all independent variables significantly influenced international market performance. Network capabilities had the strongest effect ( $\beta = 0.45$ ), followed by foreign market knowledge ( $\beta = 0.40$ ) and entrepreneurial orientation ( $\beta = 0.35$ ). The model explained 55% of the variance in performance

### **Hypothesis Testing**

All three hypotheses were accepted, confirming that network capabilities, foreign market knowledge, and international entrepreneurial orientation positively affect SMEs' international market performance

## **4.2. Discussion**

### **Network Capabilities**

The study confirms that larger, stronger, and well-connected networks enhance SMEs' access to international markets, technology, and information, reducing export risks and improving competitiveness. Strategic network positions facilitate involvement in global value chains and foster trust and loyalty among international partners

### **Foreign Market Knowledge**

Deep understanding of foreign markets enables SMEs to adapt products, pricing, and distribution strategies effectively, enhancing market responsiveness and competitive advantage. Efficient information gathering and analysis support proactive decision-making in dynamic international environments

### **International Entrepreneurial Orientation**

Proactivity, innovation, and calculated risk-taking empower SMEs to seize opportunities and innovate products tailored to international markets. Entrepreneurial orientation supports agility and sustained success in competitive global markets

### **Theoretical and Practical Implications**

The findings reinforce Dynamic Capability Theory's relevance in explaining SME internationalization. Practically, SMEs should strengthen international networks, invest in market knowledge, and foster entrepreneurial attitudes to improve export performance

## **5. Conclusion**

Network capability (NSNC) has the strongest influence on international market performance (IMP), followed by international market knowledge (FMK) and international entrepreneurial orientation (IEO). This emphasizes the importance of strong network development and market understanding in improving international performance for agro-industrial SMEs. Network-based strategies are the key to success in the global market.

In a global context, the ability to build and maintain business relationships internationally is a critical asset. Many SMEs in international markets compete not only on the basis of product quality, but also on their ability to leverage networks to support distribution, marketing, and innovation. Therefore, the result that network capability (NSNC) has the greatest influence on international market performance (IMP) is reasonable and in line with theory and practice in the field.

### **Research Limitations**

This research is subject to several limitations. First, it is geographically constrained to a specific region, namely Central Java, which may limit the generalizability of the findings to agro-industrial SMEs in regions with different economic, social, or cultural contexts. Second,

the data collection method used a Likert-scale survey, which may not fully capture the complex motivations and behaviors of respondents; thus, qualitative methods like interviews or case studies could offer deeper insights into SME behavior in international markets. Third, the study primarily examines the direct impact of independent variables on international market performance (IMP), but factors such as government support, technological infrastructure, or regulatory environment could also mediate or moderate these relationships.

Fourth, the relatively small sample size of 108 respondents may not be fully representative of all agro-industrial SMEs, and future research with larger and more diverse samples could enhance the external validity of the results. Lastly, the research was conducted over a specific time frame, which may not account for the rapidly evolving dynamics of the international business environment, such as global economic shifts, regulatory changes, or crises, potentially affecting the findings.

### ***Suggestions for Future Research***

Future research could benefit from expanding its geographical scope to include various regions in Indonesia or even other countries, providing more comprehensive and generalizable findings. Employing mixed research methods that combine both quantitative and qualitative approaches, such as in-depth interviews or focus group discussions, would offer deeper insights into the factors affecting international market performance. Additionally, future studies should consider incorporating mediation and moderation variables, such as government support, digital infrastructure, or product innovation, to better understand their influence on the relationship between networking capabilities, international market knowledge, entrepreneurial orientation, and performance. Longitudinal studies could also provide valuable insights into how these factors evolve over time and impact ongoing international market performance. More advanced analytical techniques, such as structural equation modeling (SEM), would be beneficial for examining the causal relationships between variables.

Moreover, a focus on specific sub-sectors within the agro-industry, such as processed foods or plantation commodities, could yield more targeted insights. With these enhancements, future research could offer more precise and relevant contributions to both academic literature and business practices in the agro-industrial SME sector.

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