The Impact of Internal and External Factors on Agricultural Extension Performance through the Kostratani Program in Banten Province

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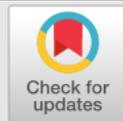
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ABSTRACT

The agricultural sector is pivotal in human sustenance by providing food, livestock feed, and bioenergy. In Indonesia, agriculture is strategically positioned in the national economy, contributing to food security, employment, and poverty alleviation, particularly within the agricultural sector. This study aims to analyze the factors influencing the Kostratani program, assess internal factors affecting the performance targets of instructors within the Kostratani program as an intervening variable, and examine external factors influencing the performance targets of instructors within the Kostratani program. Employing a quantitative approach, this research utilizes survey and interview methods conducted in Banten Province across various Agricultural Extension Centers, particularly focusing on constructing Agricultural Extension Centers in Lebak Regency, Pandeglang Regency, and Tangerang Regency. The findings reveal that internal factors significantly influence the Kostratani Program and the performance targets of extension officers, while external factors show no significant impact on either. Moreover, the Kostratani Program exhibits a noteworthy influence on the performance targets of extension officers.

1. Introduction

The agricultural sector is a cornerstone of human sustenance, providing essential resources such as food, livestock feed, and bioenergy (Khatri et al., 2023; Mergos, 2022). In Indonesia, agriculture assumes a strategic role in the national economy, serving as a linchpin for ensuring food security, fostering employment opportunities, and addressing poverty, particularly within rural communities (Bashir et al., 2019; Malahayati & Masui, 2022; Prihadyanti & Aziz, 2023).

Moreover, the sector contributes significantly to economic growth through its intricate network of downstream and upstream agro-industries, facilitating the export of agricultural commodities and bolstering the nation's foreign exchange reserves.

Addressing the burgeoning food needs of Indonesia's populace presents a formidable challenge, particularly in light of the projected population surge to 322 million individuals by 2050. Indonesia is the fifth most populous country globally, trailing only China, India, Nigeria, and the United States (Wilson & Samosir, 2015). Legislative frameworks such as Law Number 17 of 2007, outlining the National Long-Term Development Plan for 2005-2025, and Presidential Regulation Number 18 of 2020, delineating the National Medium-Term Development Plan for 2020-2024, underscore the imperative of bolstering domestic food security and fostering economic growth, with a keen focus on the agricultural sector.

In light of these imperatives, there exists a compelling need to accord precedence to the agricultural sector in Indonesia, thereby catalyzing national economic growth. Projections suggest a tangible uptick in the sector's contribution to economic expansion over the five years, with an anticipated annual growth rate ranging from 5.7% to 6.0%. This growth trajectory hinges upon several key factors, including heightened productivity in pivotal crops such as rice, corn, and soybeans, sustained investments in agricultural infrastructure and technology, robust monitoring and evaluation mechanisms for labor within the agricultural sector, and the augmentation of human resources (HR) quality within agricultural practices.

These concerted efforts are aimed at bolstering the overall quality of Indonesia's economy by 2024, as evidenced by discernible improvements in key macroeconomic indicators. These indicators encompass stabilized inflation rates, diminished poverty levels, reduced unemployment rates, ameliorated income inequality as indicated by lowered Gini coefficients, and heightened Human Development Index (HDI) scores.

Indonesia's agricultural sector remains a cornerstone of livelihoods for small-scale farmers, representing a crucial source of income. Looking ahead over the next five years, this sector is projected to experience significant growth, necessitating proactive adjustments to navigate the evolving strategic landscape domestically and internationally. Addressing the multifaceted challenges of agricultural development, which hold profound implications for both the government and farmers, demands a concerted effort to stimulate economic growth and improve the income of farmers who typically operate on limited landholdings, often less than half a hectare in size.

Central to this endeavor is the imperative to enhance agricultural products' competitiveness and bolster agricultural commodities production. By achieving these objectives, there is a tangible opportunity to augment the agricultural sector's gross domestic product (GDP), uplifting farmer income and overall welfare. The success of agricultural development and increased production in Indonesia hinges upon the effectiveness of institutions overseeing these initiatives. This underscores the importance of leveraging Indonesia's abundant natural and human resources, indispensable in driving progress.

Indonesia's rich biodiversity is a product of various factors, including its tropical climate and generous rainfall, which foster the rapid growth of diverse plant species. Moreover, the country's mountainous terrain harbors mineral-rich tectonic sources, while its extensive water bodies support many marine life teeming with mineral resources. The interplay between

natural resources and a nation's economic standing is undeniable, as accelerated economic growth spurs demand for resource goods during production, consequently impacting natural resource availability.

Contrary to conventional wisdom, abundant natural resource wealth does not guarantee economic prosperity, as evidenced by several countries endowed with substantial natural resources but experiencing relatively low economic development (Suparmoko, 2014). Furthermore, human resources (HR) are pivotal in agricultural development and economic growth. Human resources are indispensable for decision-making and productivity enhancement in the agricultural sector. Addressing the challenge of low farmer participation in agricultural development decisions is paramount, as it impedes progress in enhancing food productivity.

The enhancement of human resources, particularly through the empowerment of farmers facilitated by government-provided agricultural instructors, is pivotal. These instructors are essential conduits for assisting farmers and disseminating crucial technological information about cultivation and marketing practices. By bolstering human resources and capitalizing on natural assets, Indonesia can foster sustainable agricultural development and propel economic growth within the sector. This, in turn, will uplift the livelihoods of small-scale farmers, contributing significantly to overall national prosperity and socio-economic advancement.

Ensuring food security and meeting the nutritional needs of Indonesia's growing population are top priorities for the government. The Population Census 2020 reveals a continuous rise in Indonesia's population, reaching 270.20 million people by September 2020, a significant increase of 32.56 million compared to the 2020 results. With an average annual population growth rate of 1.25 percent during 2010-2020, the demand for food is escalating accordingly (Hull, 2023).

The government has initiated a strategic program to centralize agricultural data through a comprehensive big data system to address this challenge. Concurrently, efforts are being made to strengthen agricultural extension services and extension centers at the sub-district level. At the core of this endeavor lies the Agricultural Development Strategic Command Program (Komando Strategis Pembangunan Pertanian or KOSTRATANI), which adapts to the rapidly evolving agricultural landscape driven by technological advancements.

Technology is crucial in meeting dynamic market demands, particularly in ensuring agricultural products' quality, quantity, and consistency. The Kostratani program plays a vital role in monitoring regional agricultural developments. Recognizing the pivotal role of data in securing future food supplies, policies, programs, and developmental activities within the agricultural sector are anchored in accurate field data and information.

Within its operational framework, Kostratani optimizes the functions of agricultural extension centers, aligning them with the principles of the Fourth Industrial Revolution. Against this backdrop and identified research gaps, this study aims to explore various internal and external factors within the Kostratani program that could impact the performance of extension workers in agricultural extension centers. Specifically, the research will examine multiple agricultural extension centers across regencies within Banten province, analyzing effectiveness indicators and identifying potential areas for program enhancement.

2. Literature Review

Van Den Ban and Hawkins underscore the distinction between counseling and extension services within the agricultural context, noting that while counseling is a form of tailored non-formal education for farmers, accepting extension services can vary among organizational members and the broader community (Van Den Ban & Hawkins, 1999). This suggests that while some members of agricultural organizations may readily embrace extension services, there may be resistance or ambivalence from the wider community.

In many developing nations, the hierarchical nature of the extension model prevails, characterized by a top-down flow of directives from the Ministry of Agriculture to extension workers. The primary objective of this hierarchical structure is to facilitate farmers' adoption of the latest agricultural technologies (Swanson et al., 1997). This top-down approach reflects the prevailing paradigm in agricultural extension services in such contexts, emphasizing the disseminating of knowledge and technology from higher authorities to grassroots-level farmers.

Röling and Brouwers highlight the importance of fostering original technology development and encouraging farmer experimentation as essential strategies for promoting sustainable agricultural practices (Röling & Brouwers, 2000). This suggests a shift towards a more participatory and adaptive approach within agricultural extension services, wherein farmers are actively engaged in the innovation process and are empowered to experiment with new practices tailored to their local contexts.

Internal factors emerge as critical determinants of the effectiveness of agricultural extension services. These factors encompass various dimensions such as age, tenure, the number of farmers assisted, proficiency in extension program planning, leadership skills, developmental potential, the need for affiliation, intellectual self-reliance, and social self-reliance. These internal factors significantly enhance the performance of agricultural extension services, highlighting the multifaceted nature of the factors influencing the efficacy of extension programs (Bahua, 2013).

3. Research Methodology

The methodology adopted in this study employs a survey approach, which entails collecting data from a sizable number of individuals to derive insights representative of the population (Supranto, 2000). The primary data collection tool is a questionnaire administered electronically to enhance efficiency. Additionally, secondary data in the form of pre-existing information was gathered from various relevant agencies.

A population refers to a group of subjects, variables, concepts, or phenomena under investigation, with each member providing valuable insights into the characteristics of the overall population (Sofian & Singarimbun, 2012). In this research, the population consists of agricultural instructors stationed at the agricultural extension center of Kostratani in Lebak, Pandeglang, and Tangerang, totaling 45 individuals. Sampling was conducted by selecting five civil servants and 5 Government Employees with Employment Agreement personnel from each agricultural extension center across the three regencies in Banten Province. This resulted in a total sample size of 45 agricultural extension workers.

The research data analysis utilizes SMART-PLS software, which enables the examination of factors contributing to an event without the need for normally distributed data. This software facilitates multivariate analysis while mitigating issues related to multicollinearity among exogenous variables. Partial Least Squares (PLS) is the analytical method renowned for its soft modeling approach, circumvents Ordinary Least Squares (OLS) regression assumptions, and addresses multicollinearity concerns among exogenous variables. The analysis encompasses model measurement (outer model), model structure (inner model), and hypothesis testing, ultimately enabling structural analysis or Structural Equation Modeling (SEM) through PLS.
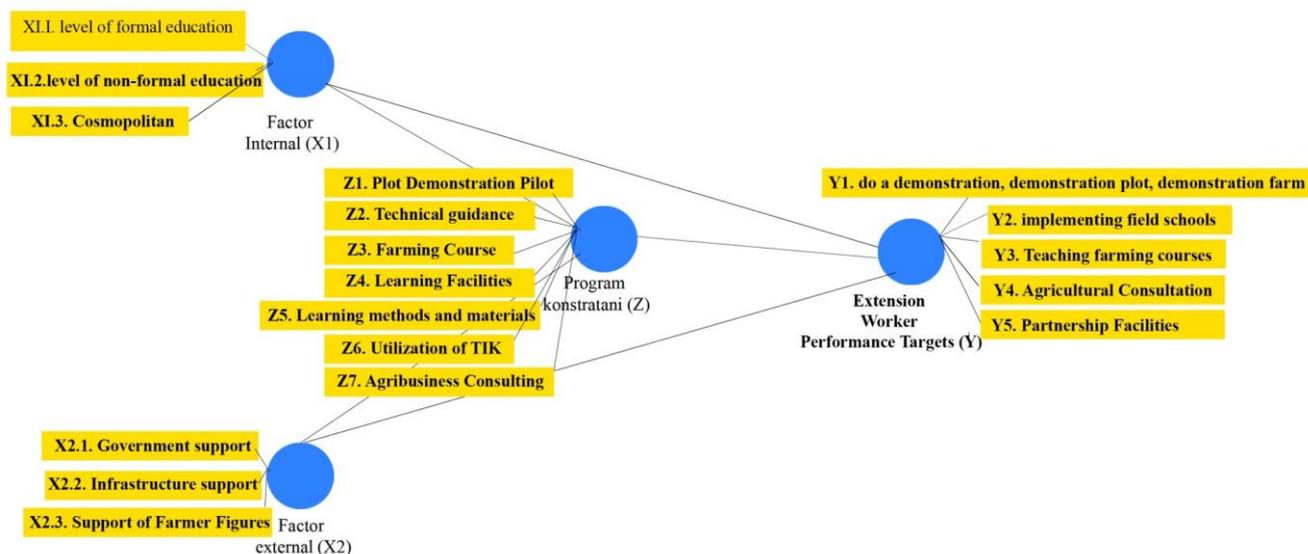

Figure 1. Overview of the research data analysis methodology using SMART-PLS software

4. Results and Discussion

4.1. Results

The research findings shed light on the evaluation practices within the agricultural extension context. It was observed that a significant proportion of extension workers did not engage in evaluations to assess the implementation and impact of their extension activities. This suggests that the culture of systematically evaluating and reporting implementation outcomes is not fully ingrained in the respondents' agricultural extension initiatives.

Furthermore, the performance assessments conducted for agricultural instructors serve as a mechanism to enhance their future performance. These assessments offer valuable insights into the outcomes and achievements of their work, contributing to ongoing efforts to improve the quality and effectiveness of extension services. Through systematic and continuous evaluations, the level of success based on the performance parameters of agricultural instructors in fulfilling their duties and responsibilities is gauged.

Table 1. Statistical Analysis

Variable	T-Statistics	T-Table
Internal (X1) > Kostratani Program (Z)	2.960	1.682
Internal (X1) > Extension Worker Performance (Y)	5.262	1.682

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Variable	T-Statistics	T-Table
External (X2) > Kostratani Program (Z)	1.646	1.682
External (X2) > Extension Worker Performance (Y)	0.242	1.682
Kostratani Program (Z) > Extension Worker Performance (Y)	4.211	1.682

Source: Data processing (2022)

The table presents the statistical analysis results conducted to explore the relationships between various factors within the context of agricultural extension. The T-Statistics values indicate the strength and significance of the relationships observed, while the T-Table values serve as benchmarks for evaluating the statistical significance of these relationships.

- Internal (X1) > Program Kostratani (Z): The T-Statistics value of 2.960 indicates a significant relationship between internal factors and the Kostratani program. This suggests that internal factors influence the implementation of the Kostratani program.
- Internal (X1) > Extension Worker Performance (Y): With a T-Statistics value of 5.262, there is a strong and statistically significant relationship between internal factors and extension worker performance. This implies that internal factors play a significant role in influencing the performance of extension workers.
- External (X2) > Program Kostratani (Z): The T-Statistics value of 1.646 suggests a moderate relationship between external factors and the Kostratani program. This indicates that external factors may influence the implementation of the Kostratani program to some extent.
- External (X2) > Extension Worker Performance (Y): With a T-Statistics value of 0.242, there is a weak and statistically insignificant relationship between external factors and extension worker performance. This suggests that external factors may not significantly influence the performance of extension workers.
- Program Kostratani (Z) > Extension Worker Performance (Y): The T-Statistics value of 4.211 indicates a strong and statistically significant relationship between the Kostratani program and extension worker performance. This implies that the Kostratani program significantly influences the performance of extension workers.

4.2. Discussion

The Kostratani Program is pivotal in orchestrating the integration and synchronization of activities within the agricultural sector, facilitating coordination and synergy. Various techniques are introduced and implemented through agricultural extension initiatives to enhance farming practices. These initiatives include demonstrating and explaining agricultural skills, technologies, varieties, fertilizers essential for sustainable agricultural practices, post-harvest treatments, processing methods, and effective marketing strategies. Additionally, agribusiness consultations play a crucial role in shaping the performance of extension agents, providing indispensable support to farmers when confronted with challenges in demonstration plots.

The research findings, derived from thorough data analysis and hypothesis testing, yield several noteworthy conclusions:

1) Internal Factor Variables (X1) significantly influence the Kostratani Program, indicating their importance in driving its success.

2) Internal factor variables (X1) significantly impact extension performance targets, highlighting their crucial role in enhancing the effectiveness of extension activities.

3) Contrarily, the external factor variable (X2) does not significantly affect the Kostratani Program, suggesting that external factors may not substantially shape the program's outcomes.

4) Similarly, the external factor variable (X2) does not significantly influence extension workers' performance targets, indicating that external factors may not directly impact the performance targets of extension workers.

5) Notably, the Kostratani program variable (Z) significantly influences Extension Performance Targets, underscoring the program's impact on the performance objectives of extension workers.

Extension workers hold esteemed positions within the government and society, valued for their receptiveness to diverse ideas and their steadfast commitment to engaging with farmers and relevant stakeholders in the agricultural sector. Given the fundamental role of agriculture in Indonesia's economic development, extension workers emerge as leaders within the national movement, playing a pivotal role in motivating and driving the efforts of their peers to foster progress and innovation within the extension community.

5. Conclusion

In conclusion, the Agricultural Course plays a pivotal role in shaping the performance of extension workers. This meticulously structured program is tailored to provide farmers and their families with a systematic learning experience. Conducted regularly and over a specific duration, its primary aim is to enrich farmers' understanding, skills, attitudes, and practical expertise in agriculture. The success of the Agricultural Course hinges on the availability of essential equipment and resources such as buildings, classrooms, tables, chairs, and teaching aids, which are indispensable for creating effective learning environments. Moreover, technology emerges as a critical enabler, driving optimization efforts across various sectors, including agriculture. Its integration underscores the sector's commitment to adapting to technological advancements and enhancing productivity and efficiency in agricultural practices.

6. Conflicts of Interest and Ethical Standards

The authors certify that in this research, there are no conflicts of interest within their current organization, and no unethical practices, such as plagiarism, were followed during the research.

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