

# Implementation Of Agricultural Technology at PT. Buyung Putra Perkasa in Pemulutan Sub-District District Ogan Ilir South Sumatera

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## Abstract

The majority of the population in Indonesia lives in rural areas; agriculture is the primary sector in the economy, and the survival of rural communities. The development of the use of agricultural technology is needed to improve the quality and quantity of production, along with advances in science and technology, to meet food as one of the basic needs of human life—the application of agricultural technology in both pre-harvest and post-harvest activities. Agricultural technology aims to increase labor productivity, increase land productivity, and reduce production costs. This study aims to analyze the implementation of agricultural technology at PT Buyung Putra Perkasa in Pemulutan District, Ogan Ilir Regency. Using [GR. Terry's](#) implementation theory serves as an analytical framework that focuses on the four main components of implementation: determining, grouping, achieving goals, and assignments. This research uses a qualitative approach with a case study method. Data were obtained through interviews, direct observation, and documentation, then analyzed descriptively. The results showed that PT Buyung Putra Perkasa is a company engaged in rice field agriculture with an area of  $\pm 300$  hectares and has developed progress by using sophisticated technological tools in the process of work, thereby increasing rice productivity and running quite effectively from the aspects of company policies that support modern agricultural innovation, the competence of human resources as implementers, and supportive environmental conditions, both in terms of social, economic, and natural. The application of the technology used by PT Buyung Putra Perkasa has resulted in an increase in harvests from one two to three times each year.

**Keywords:** Implementation, Technology, agriculture

## 1. Introduction

Indonesia is an agricultural country with various expanses of land and rice fields, so the potential for agriculture in Indonesia is very supportive. Indonesia is also stretched on the equator line which has a tropical climate, sufficient sunlight, ideal air humidity levels. Foreign countries admire Indonesia in the agricultural sector. Agriculture is a sector that has a vital role

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in human life because it is the basis for providing clothing, food and shelter in running life. The agricultural sector is the foundation of people's lives in general so that many Indonesian citizens work as farmers.

Agriculture in Indonesia utilizes technological advances to help farmers work more easily and efficiently. Technological advances in agriculture can also provide more interesting innovations for farmers. The majority of the population in Indonesia lives in rural areas so that agriculture is the main sector in the economy and survival of rural communities where it is known that the national income generated from the agricultural sector is more than 50% of all income in Indonesia (Ario, 2010 in [Wireantoni, et al., 2017](#)).

The development of the use of agricultural technology is very rapid in an effort to improve the quality and quantity of production in line with advances in science and technology to meet food as one of the basic needs of human life which continues to grow. The application of agricultural technology in both pre-harvest and post-harvest activities is decisive in achieving food sufficiency both in quantity and quality of production. Agricultural technology has played a role in increasing the efficiency and productivity of food commodity farming in developed and developing countries, including Indonesia.

Over the past few decades, technology in agriculture has become increasingly developed, encompassing both production and cultivation, as well as social and economic activities of the community. This has led to increased competition among business actors in the agricultural sector. Agricultural sector actors are required to improve their ability to benefit from technology continuously. This is because information about the new technology can be channeled quickly to the recipient. ([Rachmayani, 2015](#)).

Agricultural technology in a broad sense aims to increase labor productivity, increase land productivity, and reduce production costs ([Thompson et al., 2019](#)). The use of tools and machinery in the production process is intended to increase efficiency, effectiveness, productivity, quality of results, and reduce the workload of farmers. Agricultural technology is the introduction and use of any mechanical assistance to carry out agricultural operations. Entering the industrial revolution 4.0 has an impact on industry players, where there are 4 influential industrial sectors, one of which is the agricultural sector (HR R&D Agency of the Ministry of Communication and Information, 2019).

Based on this, the implementation of the agricultural sector must be accompanied by technological developments, one of which is characterized by the use of machines that are useful in realizing the challenges of modern agriculture in achieving targets to meet their own food needs and sustainable ([Sudarwati & Nasution, 2024](#)). This situation will certainly benefit farmers in optimizing production yields and cutting the distribution chain. In addition, farmers can also estimate the pre-planting season, planting season, harvest season, and post-harvest season, including financing expenses, farm insurance, fertilizer supply, seed supply, and rice processing ([Rini, 2017](#)).

The importance of agriculture as an important sector in economic development in Indonesia is explained by (Simatupang in [Ramlawati, 2020](#)) where the contribution of the agricultural sector in economic development is very important because the majority of people in poor countries rely on the agricultural sector for their lives. Agriculture is one of the activities by utilizing and processing available biological resources and is the mainstay of the rural economy. Suppose stakeholders seriously want to pay attention to the welfare of people in rural areas. In that case,



the only step is to improve the welfare of the majority of community members who live by depending on the agricultural sector (Suyatno in [Ramlawati, 2020](#)).

Based on the Regulation of the Minister of Agriculture Number 7 of 2018, Article 1 Paragraph 1 concerning Guidelines for Agricultural Technology Transfer that “Technology Transfer is the transfer of the ability to utilize and master science and technology between institutions, bodies or people, both within the domestic environment and those from abroad into the country or vice versa”. PT Buyung Putra Perkasa, which is engaged in rice paddy farming which has a land area of around 300 hectares, has developed progress by using sophisticated technological tools with the process of working so as to increase rice productivity. The application of technology used by PT. Buyung Putra Perkasa rice harvest from the previous 1 year 1 harvest, since using technology can be 1 year 2 harvests thanks to the agricultural technology used by PT. Buyung Putra Perkasa.

Below is a table of technology tools owned by PT Buyung Putra Perkasa

Table 1. Technology Tools PT. Buyung Putra Perkasa

| No.   | Tool Name                 | Quantity Used |
|-------|---------------------------|---------------|
| 1.    | <i>Traktor John Deere</i> | 4             |
| 2.    | <i>Excavator</i>          | 2             |
| 3.    | <i>Combine</i>            | 2             |
| 4.    | <i>Drone</i>              | 4             |
| Total |                           | 12            |

*Source: Processed by researchers based on observation*

Based on the data Table 1. above, the technology tools used are more than one technology tool in each field. The technology tools owned by PT Buyung Putra Perkasa consist of 4 tools, namely 1. John Deere tractors are used for plowing and cultivating agricultural rice fields, 2. Excavators are used to clean agricultural land, make irrigation channels, dig trenches and prepare land, 3. Combine is used to harvest rice and 4. Drones are used for watering rice, sowing seeds, spraying pesticides, and spreading fertilizers.

## 2. Literature Review

### 2.1 Implementation

According to [Terry](#), implementation is an activity that involves determining, grouping, and achieving objectives, as well as assigning tasks to individuals while considering the physical environment and the authority delegated to each person to carry out the activities.

Westra defines implementation as the efforts undertaken to execute all formulated and established plans and policies by providing the necessary tools and equipment, determining who will perform the tasks, where the implementation will take place, and when it will commence.

Based on these definitions and explanations, it can be concluded that implementation is the process of realizing previously established plans to achieve objectives, taking into account the appropriateness, interests, and capabilities of the implementers and the target group.

### 2.2 Technology

Technology is a word taken from the English “Technology” which is absorbed from the Greek “Technologia”, with the meaning of knowledge expertise. The root word of technology itself is

“techne” which means a series of principles or a rational method in which it is also closely related to the manufacture of an object, knowledge and art regarding various principles or methods, and certain skills and expertise.

Meanwhile, in the Big Indonesian Dictionary (KBBI), technology is the overall means of providing goods necessary for the survival and comfort of human life. So, it can be said that with technology, an activity will be easier to complete.

### *2.3 Agriculture*

Agriculture is derived from the Latin words ager (field) and colo (cultivate) this process signifies, when combined, the Latin agricultura means field or cultivation of land. However, agriculture in its broadest sense is an integral part of farming and has descriptive meanings such as cultivation, domestication, horticulture, arboriculture, and vegiculture, as well as forms of livestock management such as mixed crop-livestock farming, pastoralism, and transhumance ([Harris and Fuller, 2014](#))

Agriculture in its broadest sense is the human use of biological resources through the cultivation of crops that are productive and lifelong. Activities in agriculture, plantations, forestry, livestock, and fisheries whose results can be utilized for the benefit of human life. Agriculture in a narrow sense is the process of growing crops on land whose results can meet human needs. Agriculture in a narrow sense has a cultivation process carried out on land that has been prepared and controlled manually.

### **3. Research Method**

This type of research uses qualitative methods with descriptive research type of in-depth understanding and exploring comprehensively about how agricultural technology is used and has an impact in agricultural practices, who is involved in decision making and implementing agricultural technology and the impact on productivity, workload, income, and welfare of farmers. Data collection techniques include documentation, interviews and observation. Data analysis techniques by means of data reduction, data presentation and conclusion drawing. The data below were obtained from the authors through the data collection process through observation, interviews and documentation. This interview was conducted by asking several questions related to the implementation of agricultural technology at PT Buyung Putra Perkasa in Pemulutan District, Ogan Ilir Regency. These questions were asked to the head in charge of PT Buyung Putra Perkasa, the representative of PT Buyung Putra Perkasa, the head of PT Buyung Putra Pangan, and farmers or workers of PT Buyung Putra Perkasa. The data analysis used is data reduction used from the results of interviews, data presentation and conclusion drawing from the results of interviews.

### **4. Findings and Discussions**

This study aims to examine how the implementation of agricultural technology at PT Buyung Putra Perkasa is able to produce rice harvests previously 1 year 1 harvest, so that it can be 1 year 2 harvests. As well as obstacles that arise in technological tools in constraints in irrigating rice fields at PT Buyung Putra Perkasa. The implementation of agricultural technology is a plan that has been prepared previously to achieve certain goals and can be implemented in reality which includes concrete actions and organizing resources so that the desired goals can be achieved effectively and efficiently through the application of engineering science to agricultural activities at PT Buyung Putra Perkasa.

Implementation is an action or implementation of a plan that has been prepared in a mature and detailed manner, implementation is usually carried out after planning has been considered mature. In general, implementation can be interpreted as application, according to [Terry](#), implementation is a stage or process in management or administration where plans that have been prepared previously are carried out in reality to achieve the goals that have been set. Implementation includes concrete actions and organizing resources so that the desired goals can be achieved effectively and efficiently.

Agricultural Technology is the application of science and engineering in agricultural activities with the aim of improving efficiency, productivity, and sustainability. It includes various tools, machines, systems, and processes used in agricultural cultivation. Agricultural technology can be described as an application of mathematical and natural science principles in order to economically cultivate crops from agricultural and natural resources for the benefit of human welfare.

Research on the Implementation of Agricultural Technology at PT Buyung Putra Perkasa in Pemulutan District, Ogan Ilir Regency is carried out at PT Buyung Putra Perkasa which is located at Jalan Mayor Iskandar Dusun III Simpang Pelabuhan Dalam Village, Pemulutan District, Ogan Ilir Regency, South Sumatra Province. Furthermore, to find out the Implementation of Agricultural Technology at PT Buyung Putra Perkasa in Pemulutan District, Ogan Ilir Regency, some variables make up the implementation (actuating) according to [Terry](#), so that the authors have determined several indicators as a measure in this study, including: determining, grouping, organizational structure and external environment.

| Determining                                                                                                  | Grouping                                                                                            | Organizational structure                                                                                 | Achieving Objectives                                                     |
|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Human Resources</li> <li>• Facilities and Infrastructure</li> </ul> | <ul style="list-style-type: none"> <li>• Communication Style</li> <li>• Leadership style</li> </ul> | <ul style="list-style-type: none"> <li>• Authorities</li> <li>• Standard operating procedures</li> </ul> | <ul style="list-style-type: none"> <li>• External Environment</li> </ul> |

Chart 1. Implementation of Agricultural Technology at PT Buyung Putra Perkasa  
Source: Processed by the authors referring to the implementation theory of GR. [Terry](#)

The current implementation of agricultural technology at PT Buyung Putra Perkasa is based on five main interrelated dimensions: determining, grouping, organizational structure and external environment. These five dimensions play a strategic role in supporting the overall success of technology implementation. The resource dimension includes the availability, technical capabilities of the workforce involved as well as facilities, infrastructure. Communication serves as a link that ensures technology-related information can be conveyed effectively between organizational lines. Leadership is a key factor in driving technology adoption through visionary direction and decision-making that is responsive to the dynamics of modern agriculture. An adaptive organizational structure enables efficient and flexible workflows in

integrating new technologies. Meanwhile, the social environment creates a conducive working climate, and supports collaboration and active participation from all stakeholders. This five-dimensional approach shows that PT Buyung Putra Perkasa prioritizes sustainability and systemic principles in the development of agricultural technology.

#### *4.1 Determining*

Technical labor plays an important role in supporting technology-based agricultural operations at PT Buyung Putra Perkasa. In practice, the company has allocated a trained workforce to operate various types of modern agricultural tools and machinery. The distribution of labor based on the type of equipment used includes: four operators for John Deere tractors, two operators for excavators, two operators for combine harvesters, and four specialized technicians for agricultural drone operations. The utilization of this specialized technical workforce shows that the company is not only investing in the procurement of agricultural machinery, but also in human resource capacity building. This is important to ensure operational effectiveness and sustainable use of technology in the field. Each unit of equipment is run by personnel who have specific expertise, so the risk of operational errors can be minimized and work productivity can be increased.

This proportional division of labor also reflects an efficient resource management strategy, where the number of personnel is adjusted to the complexity and intensity of use of each tool. For example, the use of precision drones requires specialized skills in navigation and processing. The data, operated by four technicians, demonstrates the importance of expertise in digital agriculture.

PT Buyung Putra Perkasa has utilized various modern agricultural technology tools to support the efficiency and effectiveness of production activities in the rice cultivation sector. The use of these farming tools and machinery is part of the agricultural mechanization and digitalization strategy which is carried out in a structured and field-based manner. The company has four John Deere tractors that are used for plowing and processing paddy fields. These tractors play an important role in the early stages of cultivation, especially in preparing the soil to be suitable for planting, improving soil aeration, and accelerating the planting process. In addition, two units of excavators are utilized in clearing farmland, making irrigation channels, digging trenches, and general land preparation. This equipment has significantly contributed to improving the efficiency of land management and irrigation systems.

For the harvesting stage, PT Buyung Putra Perkasa uses two units of combine harvester machines, which function to harvest rice automatically. The use of this tool not only speeds up the harvesting process, but also reduces yield losses due to manual harvesting, as well as improving the quality of the grain produced.

In addition to mechanical equipment, the company also utilizes digital technology through the use of four units of agricultural drones. These drones have various strategic functions, including watering plants, sowing seeds, spraying pesticides, and spreading fertilizers. The use of drones is a form of adoption of precision agriculture technology, which enables efficient and equitable distribution of agricultural inputs, while reducing dependence on large amounts of manual labor. Despite adopting advanced technology, PT Buyung Putra Perkasa still maintains the role of human labor in various aspects of operations. The company is also committed to improving employee welfare through training, mechanization-adaptive job placement, and human resource capacity building in the agricultural sector.

The implementation of these tools and technologies as a whole demonstrates PT Buyung Putra Perkasa' commitment in integrating mechanization and digital technology into the agricultural production system. This reflects the company's real steps in supporting modern agriculture that is oriented towards efficiency, productivity, and sustainability.

## *4.2 Grouping*

4.2.1 The communication styles used in the implementation of agricultural technology at PT Buyung Putra Perkasa can be analyzed from an organizational, operational, and participatory perspective, given that the technology adoption process involves various actors, such as management, equipment operators, technicians, and field workers. The following are the forms of communication styles applied:

### *4.2.1.a Top-Down (Instructional) Communication Style*

This style is used in the context of strategic decision-making regarding the purchase, implementation, and standardization of tools and technologies. Company management provides direct direction to operational and technical teams regarding:

1. The type of technology to be implemented.
2. Standard operating procedures (SOPs).
3. Efficiency goals and production targets.

### *4.2.2.b Participatory (Collaborative) Communication Style*

In the training and operationalization phase of the equipment, PT Buyung Putra Perkasa implemented participatory communication between technicians, equipment operators, and field workers. This style encourages:

1. Two-way information exchange.
2. Mutual learning between the old workforce and users of the new technology.
3. Adjustments to work processes based on feedback from the field.

### *4.2.2 Participative Leadership in Technology Operationalization*

In the implementation phase, PT Buyung Putra Perkasa encouraged the involvement of various organizational actors, ranging from technicians, operators, to field workers. This participative leadership style is realized through:

1. Field technical discussions regarding the use of tools.
2. Empowerment of operators as technical decision-makers.

Participative leadership enables the creation of an organizational culture that is open to input, flexible in facing challenges, and able to absorb collective knowledge.

### *4.2.3 Adaptive Leadership in Responding to Field Challenges*

The implementation of technology in the agricultural sector cannot be separated from environmental dynamics, such as climate change, land contours, and human resource capacity. The adaptive leadership style is applied by giving flexibility to field coordinators and operators:

1. Adjusting SOPs based on real conditions.
2. Analyzing the effectiveness of technologies locally.
3. Develop technical solutions based on empirical practice.

Adaptive leaders have contextual sensitivity and are able to change strategies without losing

sight of the organization's main goals ([Heifetz & Laurie, 1997](#)).

#### 4.3 Organizational Structure

Agricultural modernization requires organizational readiness to support the efficient and sustainable operation of technology. Without a clear and integrated organizational structure, technology will not function optimally in supporting the production system. PT Buyung Putra Perkasa, as an agribusiness company that has implemented various modern agricultural tools such as tractors, excavators, combine harvesters, and agricultural drones, has a functional organizational structure that underlies the systematic implementation of agricultural mechanization and digitalization.

The organizational structure for implementing agricultural technology at PT Buyung Putra Perkasa is functional and hierarchical. Central management directs technology policy, while subordinate work units carry out operational technical functions according to their respective fields. The structured division of tasks allows for focused, efficient and accountable work.

The organizational structure of agricultural technology implementation at PT Buyung Putra Perkasa shows that the successful integration of mechanization and digitalization in rice cultivation is strongly influenced by a clear division of tasks and strict implementation of SOPs. This working system based on tasks and procedures allows for work efficiency, optimization of tools, and increased productivity without neglecting the role of human labor. This system is designed to be adaptive to modern technology.

The transformation of agriculture through mechanization and digitalization requires an organizational structure that is not only technically adaptive, but also leadership. Leadership within organizations plays a strategic role in driving technology adoption, managing structural change, and maintaining operational sustainability. This study aims to interpret the leadership styles within the organization of PT Buyung Putra Perkasa, which has implemented various modern agricultural technologies such as tractors, combine harvesters, excavators, and agricultural drones. The findings show that the dominant leadership styles are transformative, participative, and adaptive, which synergistically form the foundation of an organizational culture based on innovation, efficiency, and workforce welfare.

#### 4.4. Achieving Objectives

The external environment is an extrafunctional arena that directly or indirectly affects the existence and strategic direction of an organization. According to GR [Terry](#), the external environment includes all factors outside the organization that impact the organization's survival, performance and decision-making. For PT Buyung Putra Perkasa, which has integrated modern agricultural technology into its rice production system, the external environment acts as both a catalyst and a director of the dynamics of technological change.

4.5.1. Climate change and natural environmental conditions are also crucial external factors that influence the company's technological strategy. Weather uncertainty, potential floods or droughts, and land degradation require companies to use responsive and adaptive technologies. The use of drones for land mapping and monitoring crop conditions is a form of technological adaptation to increasingly unstable environmental conditions. Thus, technology here is not interpreted only as an efficiency instrument, but also as an external risk mitigation strategy.

4.5.2. Industry competition and global market dynamics also shape the direction of the



company's technology policy. Market demands for cost efficiency, high grain quality and supply chain traceability make technology adoption a strategic imperative. In a competitive landscape, organizations can no longer rely on conventional methods, but must be able to transform themselves through technological innovation to remain relevant and competitive.

- 4.5.3. Social and cultural acceptance of technology is also part of the external environment that needs to be interpreted sensitively. Although PT Buyung Putra Perkasa prioritizes technological efficiency, the company still maintains the principle of social balance by engaging local labor, providing skills training, and building harmonious social relations with the communities surrounding its production sites. Thus, technology does not create social disruption, but rather opens a space for empowerment that is in line with local values.

## 5. Conclusion

The implementation of agricultural technology at PT Buyung Putra Perkasa is the result of the dynamic integration of the Four organizational dimensions described by GR. Gerry, namely determining, grouping, organizational structure and external environment. The implementation of technology depends not only on the readiness of tools and machines, but also on the readiness of adaptive human resources, effective communication, a flexible organizational structure, and a transformative and participatory leadership style. In addition, success is also greatly influenced by appropriate responses to external environmental conditions, including market dynamics and ecological challenges.

This finding is in line with the initial objective formulated in the introduction, namely that the adoption of agricultural technology requires holistic organizational management in order to be effective and sustainable. Thus, the synergy between the five organizational dimensions is a key factor in supporting modernization and increased agricultural productivity at PT Buyung Putra Perkasa.

As a development prospect, further research can focus on a more in-depth analysis of the interaction between these dimensions and their impact on innovation and adaptation of agricultural technology in the long term. Applicatively, the results of this study can be used as a reference for the management of other agribusiness companies to develop technology implementation strategies that are not only oriented to technical aspects, but also pay attention to determining, grouping, organizational structure and external environment factors for organizational sustainability.

## References.

- Harris, D. R., & Fuller, D. Q. (2020). *Agriculture: Definition and overview*. In *Encyclopedia of Global Archaeology* (pp. 140–149). [https://doi.org/10.1007/978-3-030-30018-0\\_64](https://doi.org/10.1007/978-3-030-30018-0_64)
- Heifetz, R. A., & Laurie, D. L. (1997). *The work of leadership*. *Harvard Business Review*, 75(1), 124–134.

- Rachmayani, A. N. (2020). *Chapter II theoretical foundations 2.1 public policy (pp. 1–23)*. Retrieved from [https://repository.uin-suska.ac.id/12414/7/7.%20BAB%20II\\_2018168ADN.pdf](https://repository.uin-suska.ac.id/12414/7/7.%20BAB%20II_2018168ADN.pdf)
- Ramlawati, R. (2020). *The role of the agricultural sector in economic development planning in Galang District, Tolitoli Regency. GROWTH: Journal of Development Economics*, 2(1), 47–67.
- Rini, S. (2017). *The development of agricultural technology in the era of industrial revolution 4.0: Challenges and opportunities (Undergraduate thesis, Institut Teknologi Sumatera)*. Retrieved from [https://repo.itera.ac.id/assets/file\\_upload/SB2201170008/22117025\\_3\\_223028.pdf](https://repo.itera.ac.id/assets/file_upload/SB2201170008/22117025_3_223028.pdf)
- Sudarwati, S., & Nasution, M. (2024). *The role of machinery technology in supporting modern agriculture for food security and sustainable development. Journal of Agricultural Technology*, 10(2), 123–135.
- Terry, G. R. (1986). *Principles of management (W. Winardi, Trans.). Alumni. (Original work published 1958)*. Retrieved from <http://repository.uinfasbengkulu.ac.id/3913/3/BAB%20II.pdf>
- Thompson, N. M., Bir, C. L., Widmar, D. A., & Mintert, J. R. (2019). *Farmer perceptions of precision agriculture technology benefits. Journal of Agricultural and Applied Economics*, 51(1), 142–163. <https://doi.org/10.1017/aae.2018.27>
- Wireantoni, et al. (2017). *Analysis of factors affecting rubber farmers' welfare. Universitas Andalas*. (Original work cited from Ario, 2010)

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