7.8 Innovation in Business Processes for Sustainability

The Company is steadfastly committed to continuous innovation, guided by its organizational vision and mission. This development focuses not only on creating products and production processes that meet customer needs and expectations, but also on fostering sustainable economic growth for the Company.

This sustainable innovation includes using materials with low environmental impact and improving production processes to reduce energy consumption and emissions. Additionally, the Company is dedicated to developing products that support sustainable lifestyles for consumers, such as energy-saving products.

Management Approach

The Company's approach to managing innovation for social and environmental benefit involves actively engaging diverse internal departments and external stakeholders. This is a crucial strategy for creating sustainable innovation, facilitating the exchange of diverse ideas, knowledge, and experiences, which are key drivers for effective innovation.

- Support from the Board of Directors and Executive Management: The Company establishes business directions and strategies that promote sustainable innovation, embedding a culture of creativity and innovation at all organizational levels.
- Encouragement of Innovation in Production or Work Processes: The Company encourages the development of innovative approaches within production and work processes. Employees are empowered to propose and implement new ideas aimed at improving efficiency, reducing waste, shortening lead times, and enhancing overall quality. Continuous Improvement (CI) is actively promoted through various mechanisms.
- Training and Development: The Company offers training and development programs to help employees learn about sustainable innovation. These include initiatives that foster creativity, such as QCC (Quality Control Circle) and Kaizen.
- Collaboration with Research Institutions and Universities: The Company fosters partnerships with research organizations and universities to jointly develop innovative solutions. These collaborations enhance the Company's innovation capabilities by leveraging research-based development and promoting fresh perspectives through student-led creativity and ideas.
- Engagement with Local Authorities: Collaborating with local communities and authorities helps us better understand societal needs and expectations. This allows the Company to develop innovations that are more aligned with these requirements.

Engaging all internal and external stakeholders is a strategy that strengthens the robustness and flexibility of the Company's social and environmental innovation development. This leads to the creation of innovations that can achieve sustainable impact.

1. Innovation Creating Value for the Agricultural Sector

In 2024, the Somboon Group established a new company, Somboon Advance Agriculture Co., Ltd. (SAA). Its primary objective remains to extend and develop products within the agricultural machinery sector. This aims to meet the growing and diverse demands of today's agricultural sector. It also involves introducing innovations that can help reduce production costs, make work processes more convenient and faster, and enhance the efficiency of agricultural production. This reflects the commitment to offering innovations that address customer needs, economic, social, and environmental considerations. SAA supports and promotes sustainable agriculture by developing products that help reduce water and energy consumption and lower greenhouse gas emissions, contributing to a sustainable agricultural system.

Rotary Blade

Somboon Advance Agriculture Co., Ltd. (SAA) is currently a manufacturer of rotary blades used in rotary tillers. SAA has introduced a new rotary blade design to customers that significantly reduces the amount of steel raw material required for production and decreases tractor fuel consumption, while maintaining the same soil tilling performance as conventional rotary blades

In 2024, the Company commenced production and distribution of the new rotary blade model, delivering a total of 88,304 blades for use in the RX165 rotary tiller series. Additionally, SAA has developed a prototype of an alternative blade model and donated 60 pairs to a group of farmers for field testing. The objective is to monitor the blades' performance, durability, and user satisfaction. Feedback from this trial phase will be used to refine the product before its commercial production.

Product Development Process

- Customer Requirement Analysis: The process begins with a thorough understanding of customer needs and requirements to ensure the product perfectly aligns with their expectations.
- Design: The design phase starts with concept development, followed by 3D modeling and computer-based simulation. This approach emphasizes creating a product that meets customer needs in terms of functionality, performance, and lifespan.
- Prototype Creation: Before finalizing the actual production process, prototypes are created for testing. This allows for necessary modifications and adjustments, ensuring design flexibility to accommodate product variations and prevent errors before full-scale manufacturing.
- Testing: Prototypes undergo comprehensive testing in both laboratory settings and real-world environments, in close collaboration with customers. This evaluates quality, performance, durability, environmental impact, and other aspects of customer interest.
- Drawing & Engineering Standards: This is developed to ensure a standardized production process, guaranteeing that the final products meet all initial quality specifications.

Positive ESG Impacts

Environmental	Social	Economic / Governance
Reduction in CO_2 emissions from fuel savings by 0.08 liters per rai (5.8%) results in a reduction of CO_2 emissions by 0.21 kilograms per rai.	Reduced farmer working time per rai by 3.4%.	Reduced raw material costs for the Company in production by approximately 6% per piece.
	Reduced exposure risks to pollutants: Shortened field-testing durations, such as exhaust fumes and PM2.5 particles, which are known health hazards.	Environmental policy compliance: Reduced fuel consumption and pollutant emissions enable the organization to better comply with environmental regulations and standards.
	Reduced operating costs: The 5.8% reduction in fuel consumption per rai and the extended lifespan of the blades contribute to lower operating costs for farmers, increasing their income and improving quality of life.	

Sugarcane Leaf Baler

In 2024, Somboon Advance Agriculture Co., Ltd. (SAA) initiated testing of its sugarcane leaf baler product. This addresses the pressing need for efficient management of agricultural waste generated from sugarcane harvesting. During the 2022/2023 crop year, Thailand's sugarcane cultivation area spanned approximately 11 million rai, accounting for 7% of the total agricultural land. Sugarcane production reached 94 million tons, generating an economic value exceeding 100 billion baht (data referenced from the Sugarcane Cultivation Situation Report 2022-2023, Office of the Cane and Sugar Board). A major challenge post-harvest is the large volume of leftover sugarcane leaves, estimated at 15-17 million tons annually. Only 1-2 million tons of this material are currently collected for various uses. Most sugarcane leaves are left behind and burned to prepare fields for the next planting cycle. This practice has severe consequences, including air pollution, particularly PM2.5 particulate matter, directly impacting on the health of nearby communities and the environment (data referenced from the Energy Research and Development Office, Department of Alternative Energy Development and Efficiency).

The sugarcane leaf baler is equipment designed to assist farmers in managing this issue. Its core principle is to collect and compress leftover sugarcane leaves into compact rectangular bales, approximately 70 centimeters wide, 120 centimeters high, and up to 300 centimeters long. This design significantly improves storage and transportation efficiency, thereby reducing logistics and storage costs. Furthermore, the baled material can be repurposed for various uses such as biomass fuel for energy production, construction materials, or soil improvement agents.

Product Development Process

- Customer requirements analysis: The process begins with a thorough understanding of customer needs and specifications to ensure the product effectively addresses their demands.
- Design: The design phase begins with a concept design, moving into 3D modeling, and then computer simulation. The focus is on creating products that meet customer expectations for functionality, performance, lifespan, and production cost.
- Prototype creation: Since the sugarcane leaf baler is a large machine, the Company creates prototypes that strictly adhere to the design specifications. These prototypes undergo detailed inspection and testing to minimize errors before full-scale production.
- Final pre-launch testing: The prototype is tested both in laboratory settings and real operating conditions in collaboration with customers. These tests assess product quality, operational efficiency, durability, lifespan, and environmental impact.
- Drawing & Engineering Standards: This is established to ensure product quality, support efficient manufacturing, and enable effective cost control, laying the foundation for sustainable business growth.

Positive ESG Impacts

Environmental	Social	Economic / Governance
Reducing the open field burning of sugarcane leaves lowers CO_2 emissions and other pollutants generated from combustion (approximately 1.6 tons of CO_2 per ton of sugarcane leaves burned).	Minimizes air pollution, contributing to improved public health for surrounding communities.	Compliance with environmental policies: Reduced fuel usage and emissions support alignment with regulatory standards and environmental legislation.
Resource conservation by utilizing compressed sugarcane leaves as a raw material.	The recycling process and utilization of the sugarcane leaf baler can generate employment opportunities within local communities, such as in the production and sale of sugarcane-based products.	Lower marketing and testing costs through a stringent process for selecting prototype manufacturers and building trust with new customer segments by demonstrating credible business operations.
Reduce the volume of agricultural waste.	Reduce the need for land dedicated to waste disposal and provide farmers with more sustainable waste management alternatives.	

2. Innovation in Production Processes

The Company is dedicated to the continuous development and improvement of its production processes. The aim is to achieve maximum efficiency in terms of quality, output, resource utilization, and environmental impact reduction. Innovation and creativity are integrated into every stage of production, from testing and production planning to quality control, waste and energy management.

The development approach for innovation in the Company's production processes is centered on the principle of sustainable development, with the following key objectives:

- Minimizing waste
- Reducing energy and natural resource consumption
- Enhancing production efficiency and reducing operational costs
- Improving product quality to better meet customer expectations
- Creating positive environmental and social impacts at large

Project: Producing Paving Bricks from Waste Black Sand Dust

In 2024, the Company continues to adopt the 3Rs principle, Reduce, Reuse, and Recycle, as a core approach to waste management. This includes "Reduce" for minimizing waste generated during production by optimizing mold design and sand-filling systems to reduce sand loss. The other, "Reuse", is reintroducing auxiliary production materials, such as reusing black sand from molding processes through improved storage and handling systems. And the "Recycle" is for converting certified non-hazardous black sand waste into paving bricks.

To further enhance resource efficiency and reduce waste disposal volumes, the Company invested in a brick manufacturing machine in 2023. This upgrade to support black sand recycling (which was shifted from a manual production in the past) significantly improved the quality, strength, consistency, and standardization of the bricks, making them ideal for practical applications, particularly in public areas or for community projects. This initiative not only mitigates environmental impact but also creates economic value for the organization and provides social benefits using these bricks in community spaces.

Product Development Process

- Problem Analysis: The ICP2 factory generated black sand that no longer met the required mesh size standards (exceeding the standard) for reuse in production. This necessitated external disposal, leading to a significant accumulation of 96 tons of waste annually.
- Feasibility Study for Reuse: The team evaluated the properties of the non-compliant sand and assessed its suitability for repurposing as a raw material for construction materials such as interlocking blocks.
- Mix Design and Production Process Development: A new mixing formula was developed to produce interlocking blocks using the unusable black sand. The optimal ratio was identified as cement : black sand : fine sand : water = 0.5 : 2.2 : 0.5 : 1. The block forming process was also designed to align with the material characteristics and ensure production performance.
- Product Testing: Comprehensive tests were conducted to assess the strength, load-bearing capacity, and durability of the interlocking blocks under real environmental conditions. This also included assessing the feasibility of actual production and practical use.
- On-Site Implementation: The blocks produced through this process are now used in the construction of internal factory structures, such as storage areas and sheds. Their performance is comparable to conventional blocks.
- Community Value Creation: In 2024, the Company extended the benefits of this innovation to the community. A total of 8,500 blocks were donated to local beneficiaries, including Wat Phuttha Udom Wihan School and surrounding communities, to support the construction of public buildings and communal spaces. This effort promotes the use of local circular resources, creates economic value through follow-up activities, and contributes to improving the quality of life for the community.

Positive ESG Impacts

Environmental	Social	Economic / Governance
Reduced waste from black sand by 50 tons/year (previously from 175 tons to 125 tons).	Lowered construction material costs for community projects by approximately 93,500 baht/ year.	Reduced disposal costs of black sand dust by 65,280 baht per year.
Decreased the need for new sand by approximate-ly 30 tons/year.	Created opportunities for employee and community engagement in at least 2 local development projects per year.	Increased resource utilization value and created future business opportunities.
Reduced landfill space usage by approximately 70 square meters/year (based on flat fill calculation).	Beneficiaries include approximately 250 individuals annually, such as teachers and students.	Supported the Company's commitment to the Zero Waste to Landfill operational policy.
Indirectly reduced CO_2 emissions from waste transportation by approximately 5 tons CO_2e/year.