spamastresearchjournal.ph
Volume 8 No. 1 December 2025
https://doi.org/10.64656/spamastrj.v8i1.46

P-ISSN: 1655-8839
E-ISSN: 3082-5164

SPAMAST RESEARCH JOURNAL

SUPPLY CHAIN OF ADLAI (*Coix lacryma-jobi*) IN DAVAO OCCIDENTAL

Grace D. Buencillo[1*], Lailanie H. Cabigas[1], Glenn M. Demillo[1 2], Edelyn S. Albiso[1], Emanuel C. Aznar[1], Russel B. Lovitos[1]

[1]*Institute of Business Management and Governance, Southern Philippines Agri-Business and Marine and Aquatic School of Technology*
[2]*University of Southern Mindanao*
*Corresponding author: gracedelute@gmail.com

Article History
Received: 12/31/2025
Revised: 09/01/2026
Accepted: 10/21/2026
Published: 11/03/2026

ORCID ID:
Author1: https://orcid.org/0009-0002-8548-7411
Author3: https://orcid.org/0000-0001-8490-4805
Author4: https://orcid.org/0009-0007-0812-113X
Author5: https://orcid.org/0000-0002-9218-3611

Open Access. This article published by SPAMAST Research Journal is licensed under a Creative Commons Attribution-Noncommercial 4.0 International (CC BY-NC 4.0). You are free to share (copy and redistribute the material in any medium or format) and adapt (remix, transform, and build upon the material). Under the following terms, you must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. You may not use the material for commercial purposes. To view a copy of this license, visit: https://creativecommons.org/licenses/by-nc/4.0/

ABSTRACT. Understanding the intricacies of the Adlai supply chain—from cultivation to market distribution—is crucial for enhancing the grain's efficiency and sustainability. This descriptive study investigates the Adlai supply chain in Davao Occidental, utilizing interviews with local farmers and employing various research tools to analyze data using mean and percentage. Results showed that the Adlai supply chain in Davao Occidental, though seemingly simple with few intermediaries, suffers from limited geographical reach, hindering productivity and farmer incomes. Challenges include low consumer awareness, inadequate processing and marketing infrastructure, vulnerability to pests, lack of improved varieties, and reliance on traditional farming methods. However, opportunities abound. Growing health consciousness, the crop's ecological sustainability, increasing government support offer promising avenues for income generation and rural development, and potential for value-added products.

Keywords: *Adlai, supply chain, key roles, challenges, opportunities*

INTRODUCTION

Adlai, scientifically known as Coix lacryma-jobi, is an ancient grain that has been cultivated for centuries, primarily in Asia. Often referred to as Job's Tears, this resilient crop is celebrated for its adaptability to various climatic conditions, making it a valuable alternative to more commonly known cereals like rice and corn. Adlai is particularly noted for its high nutritional value, boasting a rich content of protein, dietary fiber, and essential amino acids (Chen, 2015). These nutritional benefits make it an excellent dietary choice, especially in regions where food security is a concern. Additionally, its low glycemic index makes it suitable for individuals managing diabetes, further enhancing its appeal as a health food (Liu, 2017).

Despite its potential, Adlai remains underutilized and underappreciated in many parts of the world, including the Philippines. The supply chain management of Adlai had only garnered attention in recent years as researchers and practitioners recognize the grain's potential for enhancing food security and providing economic opportunities. One comprehensive study by Mendoza and Castillo (2016) examined the challenges and opportunities within the supply chain of underutilized crops, including Adlai, in the Philippines. Their research highlighted the fragmented nature of the supply chain, which often leads to inefficiencies in production, distribution, and marketing. They emphasized the need for better coordination among stakeholders and the implementation of modern supply chain practices to improve the overall efficiency and profitability of Adlai farming.

In Davao Occidental, efforts are underway to integrate Adlai into local agricultural practices, aiming to diversify crops and improve farmers' livelihoods (Reyes & Balagtas, 2018). However, in the same study, it is revealed that smallholder farmers face significant barriers, such as limited access to quality seeds, inadequate infrastructure, and a lack of market information. These challenges imply the lack of comprehensive data on Adlai supply chains, which poses further challenges to its widespread adoption and market integration.

Currently, there is limited information on the supply chain dynamics of Adlai in Davao Occidental. This lack of data hinders the optimization of production, distribution, and marketing strategies, ultimately affecting the profitability and sustainability of Adlai farming in the region. This project aimed at providing a comprehensive understanding of the Adlai supply chain in Davao Occidental. Understanding the dynamics of Adlai's production, distribution, and marketing is crucial for maximizing its potential benefits and ensuring its sustainability as a staple crop in the region (FAO, 2019).

Objectives of the Study

The general objective of the study is to assess the supply chain of Adlai in Davao Occidental.

Specifically, the following objectives were delved:

1. To map the supply chain of Adlai in Davao Occidental;
2. To identify key stakeholders and their roles in the Adlai supply chain;
3. To analyze the challenges and opportunities within the Adlai supply chain; and
4. To develop recommendations for improving the efficiency and sustainability of the Adlai supply chain.

Conceptual Framework

This study utilizes the input-process-output framework. Key inputs encompass resources such as office supplies, research tools (e.g., questionnaires, interview guides), data collection personnel (interviewers, surveyors), and data analysis software. The implementation process involves a series of steps: conducting surveys and Key Informant Interviews (KIIs), data entry and cleaning, data analysis, interpretation of findings, and finally, the drafting of the research report. The expected outputs of this study include a mapped Adlai supply chain, identification of key stakeholders and their roles within the chain, and a comprehensive list of challenges and opportunities encountered in Adlai production.

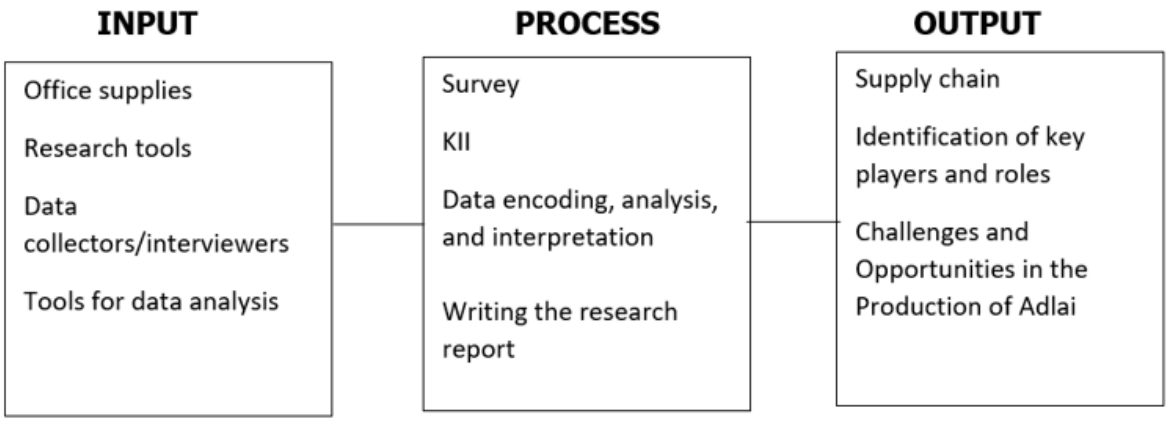


Figure 1. Conceptual framework of the study

METHODOLOGY

Research Design

This study employed a descriptive research method to gain a comprehensive understanding of the Adlai supply chain in Davao Occidental, focusing on identifying key stakeholders, analyzing existing practices, and assessing the challenges and opportunities within the system.

Sampling Design

Convenience sampling was utilized for this study due to the limited number of Adlai farmers within the Solidarity Farmers Association (SOFA). All ten members of the SOFA, along with a Department of Agriculture (DA) technician who provides guidance on Adlai production, were interviewed as part of this research.

The distribution of the respondents is presented below:

Table 1. Distribution of Respondents

RESPONDENTS	Little Baguio	TOTAL
Adlai farmers	10	10
DA worker	1	1
TOTAL		**11**

Research Instrument

An interview guide was developed and used during interview and the conduct of Key Informant Interview (KII). It was validated by the Municipal Agricultural Officer (MAO) of LGU Malita.

Respondents of the Study

The respondents of the study were the Adlai farmers of Little Baguio, Malita, Davao Occidental who are also members of the Solidarity Farmers Association (SOFA).

Data Gathering Procedure

Letter was sent to SOFA President asking permission to conduct interview with the Adlai farmers in Little Baguio who at the same time are members of the association.

Primary data were gathered using interview with the Adlai farmers, SOFA officer, and DA technician in-charge of Adlai production in Barangay Little Baguio. Survey was conducted to gather data on production volumes, prices, etc. Moreover, review of existing literature, reports, and statistical data on Adlai production and supply chains were done.

Data Processing and Analysis

Data gathered were encoded in the excel format, analyzed, and interpreted. Data were analyzed using frequency, mean, and percentage.

Ethical Consideration

Ethical approval was secured from SPAMAST Research Ethics Committee. Written informed consent of the research respondents was secured. Respondents were given the option of withdrawing from participating in the study before it began.

RESULTS AND DISCUSSION

Supply Chain

Figure 2 illustrates the Adlai supply chain within the individual farmer model. This model encompasses all stages, including production, processing (which may include

packaging), and ultimately, the disposal of the product through sales to households, government organizations (GOs), or government agencies (GAs).

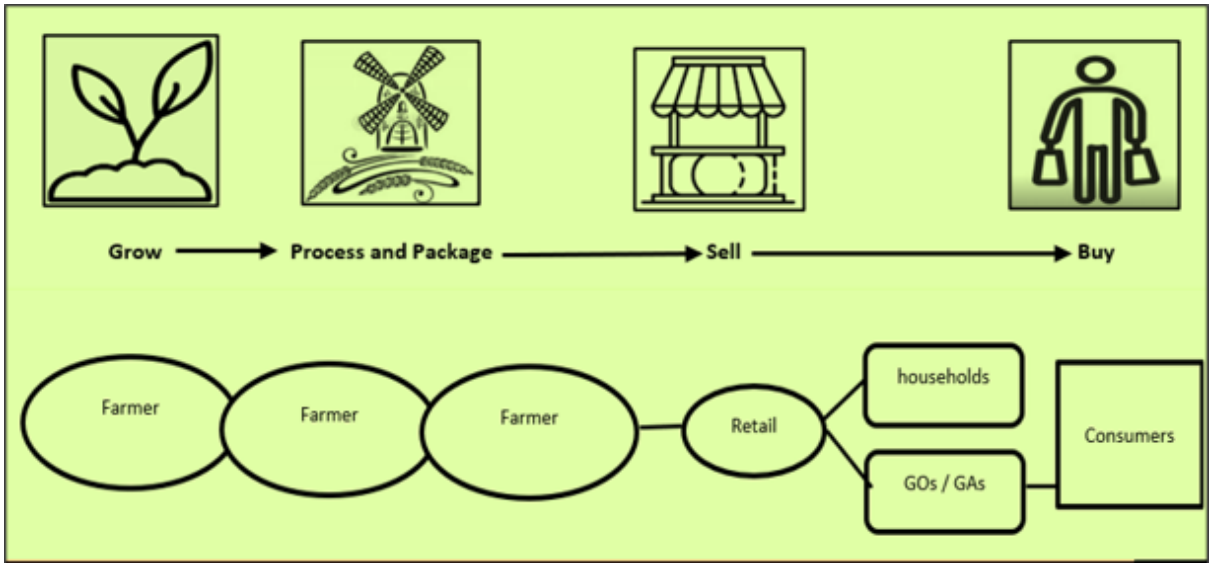


Figure 2. Supply chain of adlay (individual farmer model)

Figure 3 illustrates the Adlai supply chain within an organized farmer model. In this model, Adlai farmers are members of the Solidarity Farmers Association (SOFA), a local farmers' organization in their barangay. The Department of Agriculture (DA) – LGU Malita provides support to the SOFA. Farmers are responsible for Adlai production. The harvested produce is then forwarded to the SOFA for further processing (milling), packaging, and subsequent distribution to households, government organizations (GOs), and government agencies (GAs).

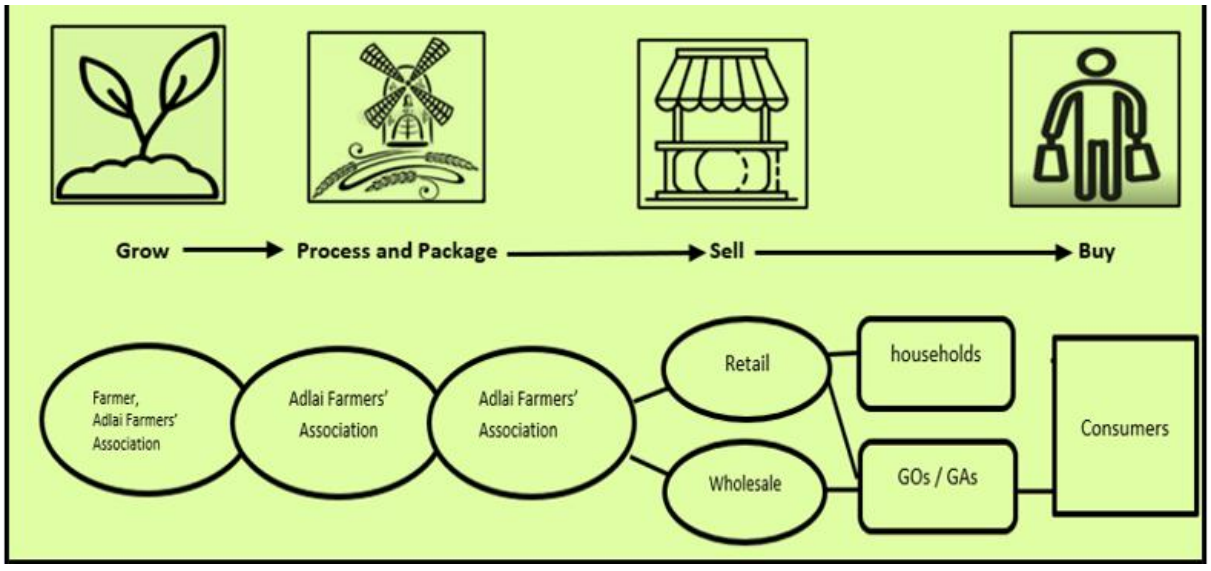


Figure 3. Supply chain of adlay (organized farmer model)

From the above discussions, it is notable that the supply chain of adlai in Davao Occidental is simple in the sense that there are few intermediaries (few producers, processor, distributor and retailers), operating in a very limited geographical area, resulting in low productivity and limited income among farmers.

Key Stakeholders and Roles in the Supply Chain

The Solidarity Farmers Association (SoFA) plays a crucial role in input supply, providing farmers with essential resources such as fertilizers and seeds. Farmers are responsible for the entire production process, including planting, cultivation, harvesting, drying, and threshing. While some farmers engage in direct grain collection, the SoFA also plays a significant role in gathering and collecting adlai from its members.

Post-harvest processing varies. The SoFA utilizes a mechanical miller for dehusking, polishing, and milling operations, while some farmers rely on traditional methods such as manual milling using mortars. Moreover, with regards to distribution, individual farmers often act as direct sellers to end-users or consumers. However, the SoFA also functions as a key player in the market, acting as both a retailer and wholesaler, supplying adlai to both individual consumers and government organizations (GOs) and government agencies (GAs).

Results of the current study are consistent with the findings of Markelova and Mwangi (2010) who similarly explain that producer organizations can help smallholders address market barriers through collective marketing and improved coordination among value chain participants.

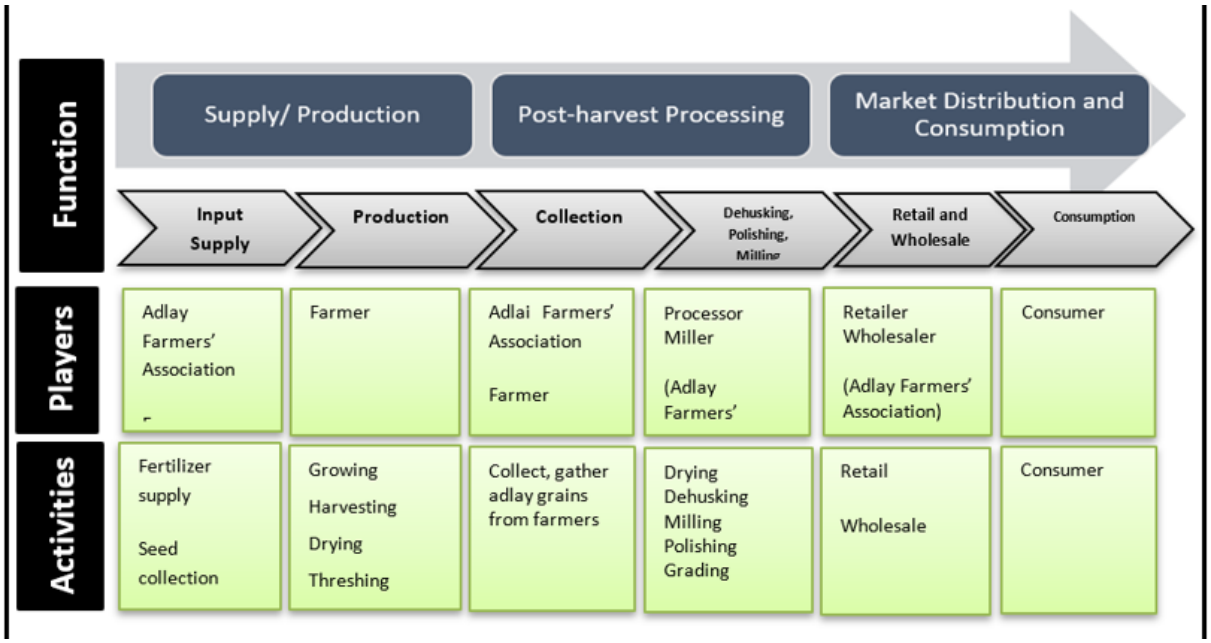


Figure 4. Stakeholders and roles in the supply chain of Adlay

Challenges in Adlai Production

Challenges in agricultural production are inevitable. All (100%) of the surveyed Adlai farmers identified limited processing and marketing infrastructure as a significant obstacle. They highlighted inadequate processing facilities for cleaning and milling, a dearth of value-added product development, and weak market linkages, coupled with limited access to reliable market information. Furthermore, 100% of the farmers acknowledged the reliance on traditional farming practices as a major challenge. The widespread use of traditional methods, while deeply ingrained, often leads to low productivity and inefficient resource utilization. To address this, the study emphasizes the critical need for technology transfer and capacity-building programs to enhance farming practices and improve overall yields.

Moreover, a significant majority of the farmers (90%) identified low awareness and demand for Adlai as a major challenge. They emphasized limited consumer knowledge regarding Adlai's nutritional value and diverse culinary applications. Furthermore, the lack of market demand for Adlai compared to more widely consumed grains such as rice and corn was a significant concern. Likewise, 90% of the Adlai farmers expressed concern regarding the limited availability of improved Adlai varieties. They highlighted the scarcity of high-yielding,

disease-resistant, and early-maturing varieties. This emphasizes the critical need for further research and development efforts to enhance the agronomic traits of Adlai.

Another major concern, expressed by 80% of the Adlai farmers, was the susceptibility of Adlai crops to pests and diseases, resulting in significant yield losses. This vulnerability is exacerbated by the limited availability of effective and affordable pest and disease control measures specifically designed for Adlai cultivation.

Previous research supports the claims of the Adlai farmers. Studies by Pingali et al. (2005) and von Braun and Tadesse (2012) highlight critical challenges faced by farmers. These include inadequate infrastructure (poor roads, limited storage), which increases logistics costs and leads to post-harvest losses. Furthermore, agricultural markets are highly volatile, influenced by factors like weather and global markets, creating significant uncertainty for farmers and hindering their ability to plan and manage risks

Table 2. Challenges encountered by farmers in Adlai production

PARTICULARS	DETAILS	f	%
Limited Processing and Marketing Infrastructure	• Insufficient processing facilities for cleaning, milling • Lack value-added product development • Weak market linkages and limited access to reliable market information	10	100
Dependence on Traditional Farming Practices	• Many farmers still rely on traditional farming methods, leading to low productivity and inefficient resource utilization • Need for technology transfer and capacity building to improve farming practices	10	100
Low awareness and demand	• Limited consumer knowledge about Adlai's nutritional value and culinary uses. • Lack of market demand compared to more popular grains like rice and corn	9	90
Lack of improved varieties	• Limited availability of high-yielding, disease resistant, and early maturing Adlai variety • Need for more research and development to improve Adlai's agronomic traits	9	90
Susceptibility to Pests and Diseases	• Pests and diseases lead to yield losses • Limited availability of effective and affordable pest and disease control measure	8	80

Opportunities in Adlai Production

Despite the challenges, the Adlai industry in Davao Occidental presents several promising opportunities: growing health consciousness among consumers, ecologically sustainable crop, income generation for farmers in rural communities, government support and intervention, as well as potential for value-added products.

In an era of a declining lifespan, the demand for healthy and nutritious foods is steadily increasing. Moreover, Adlai, a drought-tolerant and resilient crop suitable for cultivation on marginal lands, offers a promising avenue for sustainable agriculture and environmental conservation. Adlai production presents a significant income-generating opportunity, contributing to poverty reduction and rural development.

Furthermore, the growing government support through research initiatives, extension services, and market development programs creates a favorable environment for the expansion of Adlai production and consumption. Furthermore, the potential for value-added product development, such as flour, snacks, beverages, and animal feed, holds immense promise. Diversification of product lines can significantly enhance market value and profitability, thereby increasing the economic viability of Adlai production. These anticipated opportunities motivated Adlai farmers to continue pursuing Adlai production, even on a small-scale basis.

Magallon and Cabahug (2022) demonstrated the potential of Adlai for cultivation in acidic marginal upland areas under an organic production system, highlighting its potential as an alternative crop for suitable farming environments. Furthermore, studies on Adlai-based cereal drinks and cereal bars (Manning et al., 2017; Juliano & Bagabaldo, 2024) demonstrate opportunities for product diversification and value addition. These findings support the potential of Adlai production to promote sustainable farming, diversify rural livelihoods, and create additional market opportunities for farmers in Davao Occidental.

Table 3. Opportunities identified by farmers in Adlai production

PARTICULARS	DETAILS	f	%
Growing health consciousness among consumers	• Increasing consumer interest in healthy and nutritious foods • Adlai's high nutritional value presents a significant market opportunity Lack value-added product development	10	100
Ecologically sustainable crop	• Adlai is drought-tolerant and resilient crop that can thrive in marginal lands • Promotes sustainable agriculture and environmental conservation	10	100
Income generation for farmers in rural communities	• Adlai can provide income opportunities for smallholder farmers • Can contribute to poverty reduction and rural development	10	100
Government support and intervention	• Government support through research, extension services, and market development • Development of policies that promote Adlai production and consumption	10	100
Potential for value-added products	• Development of diverse Adlai-based products such as flour, snacks, beverages, and feed • Diversification of product lines can increase market value and profitability	9	90

CONCLUSION

The simplicity of the Adlai supply chain in Davao Occidental, while seemingly advantageous due to fewer intermediaries, actually contributes to low productivity and limited income for farmers. Addressing the challenges of low awareness, limited infrastructure, and dependence on traditional farming practices is crucial to unlocking the significant opportunities presented by the growing health consciousness surrounding Adlai, its potential for value-added products, and its ecological sustainability.

To enhance the Adlai industry in the province, the following are suggested:

a. Improving market access by connecting farmers with wider markets and promoting value-added products.

b. Strengthening production practices is crucial, including developing high-yielding varieties and providing access to modern farming technologies. Investing in infrastructure, such as processing facilities, which is essential for efficient logistics.
c. Raising consumer awareness through education campaigns and promoting Adlai's health benefits is key to increasing demand.
d. Finally, fostering government support through policies, programs, and collaboration among stakeholders is vital for the sustainable growth of the Adlai industry in Davao Occidental.

ACKNOWLEDGMENTS

The researchers express sincere gratitude to the Adlai farmers who generously shared their valuable time and insights for this study. The researchers also extend their appreciation to the officers of the Solidarity Farmers Association (SoFA) for their warm hospitality and invaluable assistance in providing essential information. Furthermore, the researchers would like to acknowledge the invaluable support of the Department of Agriculture (DA) – LGU Malita, particularly Mrs. Aubrey E. Bautista, for facilitating the researchers' connection with the Adlai farmers in Barangay Little Baguio, Malita, Davao Occidental.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest in this study. They affirm that there are no personal, financial, or professional interests that could have influenced the research outcomes.

DECLARATION OF THE USE OF ARTIFICIAL INTELLIGENCE

Regenerative AI is primarily used for tasks like grammar checking, identifying misspelled words, and proofreading. Its capabilities are limited to these specific functions.

REFERENCES

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, Inequality, and the Poor. Journal of Economic Growth, 12(1), 27-49.

Chen, Y. (2015). Nutritional Benefits of Adlai. Journal of Food Science, 45(3), 123-130.

Food and Agriculture Organization (FAO). (2019). Global Production Trends of Underutilized Crops. Food and Agriculture Organization.

Garcia, P., & Hernandez, F. (2020). Value Chain Integration for Enhancing Competitiveness of Adlai. International Journal of Agricultural Economics, 15(3), 225-238.

Kohli, A. K., & Jensen, B. (2010). Assessing the Efficiency of Agricultural Supply Chains. Journal of Agribusiness Management, 22(3), 57-73.

Liu, A. (2017). Health Benefits of Adlai. Nutrition Journal, 56(2), 98-105.

Magallon, W. N., & Cabahug, A. G. (2022). Field performance of adlai under organic planting system in acidic marginal upland in the Philippines.

Markelova, H., Meinzen-Dick, R., Hellin, J., & Dohrn, S. (2009). Collective action for smallholder market access. Food Policy, 34(1), 1–7. https://doi.org/10.1016/j.foodpol.2008.10.001

Mendoza, M., & Castillo, J. (2016). Challenges in the Supply Chain of Underutilized Crops. Agricultural Systems, 78(4), 345-360.

Pingali, P., Khwaja, Y., & Meijer, M. (2005). The Impact of Infrastructure on Agricultural Productivity. Food Policy, 30(3), 215-228.

Reyes, M. R., & Balagtas, J. V. (2018). Promoting Adlai Cultivation in the Philippines: Opportunities and Challenges. Journal of Agribusiness Management, 12(2), 45-60.

Santos, L., & Lim, R. (2019). Enhancing Supply Chain Efficiency through Technology: A Case Study of Adlai. Journal of Supply Chain Management, 23(1), 102-115.

von Braun, J., & Tadesse, G. (2012). Global Food Price Volatility and Spikes: An Overview of Costs, Causes, and Solutions. ZEF-Discussion Papers on Development Policy, No. 161.