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A comprehensive analysis of the current landscape of ginger cultivation and market dynamics in Sri Lanka

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Abstract

Ginger (Zingiber officinale Roscoe), a vital agricultural commodity in Sri Lanka, holds significant economic and cultural value, renowned for its unique flavor and medicinal properties. This study presents a comprehensive analysis of ginger cultivation and market dynamics in Sri Lanka from 2006 to 2023. Over this period, ginger production has shown substantial fluctuations, with notable declines in 2016/2017 and 2022/2023, attributed to external factors such as weather variability, pest outbreaks, and market demand fluctuations. The research highlights trends in production, cultivated area, and farm gate prices, revealing a weak correlation between production and pricing, suggesting that market intermediaries and global demand significantly impact price stability. The study identifies key challenges faced by ginger farmers, including inconsistent production, price volatility, and the concentration of cultivation in select regions. Recommendations include the promotion of climate-smart agricultural practices, the establishment of minimum support prices, and partnerships with private companies to stabilize prices and improve product quality. Additionally, expanding ginger cultivation to underutilized regions and improving export competitiveness through quality control and certifications are vital strategies. This analysis provides insights into the potential for value-added processing infrastructure and the importance of sustainable growth through knowledge sharing and improved farm-tomarket infrastructure. It underscores the need for continued policy review to balance domestic production and trade, fostering a resilient and competitive ginger industry in Sri Lanka. The findings serve as a guide for stakeholders to support sustainable development and enhance the sector's contribution to the economy.

Keywords: Farmers; Ginger; productivity; fluctuation; Value-addition

1. Introduction

1.1. Overview of Ginger Cultivation in Sri Lanka

Sri Lankan ginger, renowned for its robust flavour and aromatic properties, is a staple in both culinary and medicinal traditions. This tropical root, known scientifically as *Zingiber officinale* Roscoe, thrives in Sri Lanka's rich, fertile soil and humid climate, contributing to its superior quality. Traditionally grown in the mid and low-country regions, ginger farming has become an integral part of the agricultural landscape. Smallholder farmers dominate the sector, employing both traditional and modern farming practices to cultivate ginger on small to medium-sized plots of land. The main three varieties called Local, Rangoon and Chinese are cultivated in Sri Lanka. The Local variety is cultivated from ancient times and boasts a potent aroma, taste and medicinal properties as well as rich in antioxidants and anti-inflammatory compounds. It enhances the flavour of curries, teas, and confections, while its medicinal properties are revered in Ayurvedic practices. The cultivation of this ginger supports local agriculture and sustainable farming practices, reflecting Sri Lanka's commitment to producing high-quality spices. Its unique profile and health benefits make Sri Lankan ginger a prized addition to kitchens and medicine cabinets worldwide.

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The major ginger-producing countries are India, China, Nigeria, Indonesia, Bangladesh, Thailand, Philippines, Jamaica etc. It is also grown in Australia, Fiji, Brazil, Sierra Leone and Japan. United Kingdom, United States, Japan and Saudi Arabia import large quantities of ginger. Nigeria ranks first with respect to area under ginger covering about 56.23 % of the total global area followed by India (23.6%), China (4.47%), Indonesia (3.37%) and Bangladesh (2.32%) [1]. India ranks first with respect to ginger production contributing about 32.75% of the world's production followed by China (21.41%), Nigeria (12.54%) and Bangladesh (10.80%). Asian countries lead in the supply of ginger in the world market. Japan and USA are the major importers. China has the major export share. Australia is the world leader in value added products. India has 50% share in oil and oleoresin trade [1].

In Sri Lanka, ginger is grown all over the country but wet and intermediate zones are major growing areas [2] The total cultivated extent in 2023 was 1838 ha. Kurunegala, Kandy, Gampaha, Colombo and Kegalle Districts are main growing areas. ginger is largely grown as an inter-crop with coconut and as a home garden crop. Total production in 2023 was 13785 Mt [3]. The research and development activities of ginger were done by the Department of Agriculture until 2007. However, since 2008, the Department of Export Agriculture has been conducting research and development activities on ginger. Over the years, the cultivation area and production volume have seen significant fluctuations, influenced by factors such as market demand, weather conditions, and government policies.

In 2022, the global production of ginger reached 4.8 million metric tons, cultivated across 456,747 hectares worldwide [4]. This robust production aligns with the ginger market's growing economic significance, valued at USD 4.8 billion in 2023 and projected to surge to USD 9.4 billion by 2033, with a compound annual growth rate (CAGR) of 7.1% during the forecast period. The Global Ginger Market size was valued at USD 4.5 billion in 2023 and is estimated to grow at a CAGR of around 6.9% during the forecast period, 2024-30 [5,7]

Fresh ginger dominates the market, representing approximately 40% of the market share due to its extensive use in both culinary and medicinal contexts. The food and snacks sector are the leading application, accounting for around 30% of market demand, driven by the popularity of ginger-flavored products. Regionally, the Asia-Pacific area commands about 45% of the market, underlining its pivotal role in the global ginger trade. With increasing consumer interest in natural and organic products, the market presents promising growth opportunities, spanning various forms and applications including powdered, dried, and preserved ginger [6,7].

1.2. Importance of Ginger in the Agricultural Sector

Ginger holds significant importance in Sri Lanka's agricultural sector for several reasons:

- Economic Contribution: Ginger cultivation provides a substantial source of income for many smallholder farmers and contributes to the overall agricultural GDP of the country.
- Employment Generation: The ginger industry generates employment opportunities for a large number of people, including farmers, laborers, and those involved in processing and marketing.
- Export Potential: Sri Lankan ginger has a growing demand in international markets, particularly in countries where ginger is not widely cultivated. This presents lucrative export opportunities that can enhance the country's foreign exchange earnings.
- Culinary and Medicinal Uses: Ginger is a staple ingredient in Sri Lankan cuisine and traditional medicine. Its diverse uses in food, beverages, and health products make it an indispensable crop for both domestic consumption and commercial purposes.

1.3. Purpose and Scope of the Analysis

The primary purpose of this analysis is to provide a detailed and comprehensive overview of ginger cultivation and market dynamics in Sri Lanka. This includes examining current cultivation practices, production statistics, market structures, economic impacts, and future prospects. By doing so, the analysis aims to:

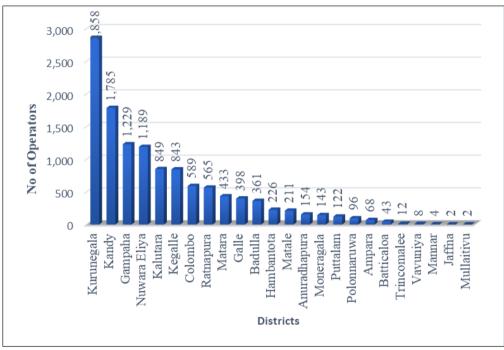
- Identify Trends and Patterns: Understand the historical and current trends in ginger production and market dynamics to identify patterns and predict future developments.
- Highlight Challenges and Opportunities: Explore the challenges faced by ginger farmers and the industry as a whole, while also identifying potential opportunities for growth and improvement.
- Inform Policy and Decision Making: Provide valuable insights and recommendations for policymakers, stakeholders, and farmers to support sustainable development and enhance the competitiveness of the ginger sector.

 Promote Knowledge Sharing: Facilitate the sharing of knowledge and best practices among farmers, researchers, and industry professionals to foster innovation and collaboration in ginger cultivation and marketing.

Through this comprehensive analysis, my aim to contribute to the ongoing efforts to strengthen the ginger industry in Sri Lanka, ensuring its sustainable growth and maximizing its potential to benefit the country's economy and agricultural sector.

2. Production Statistics

The last censes was conducted in 2014 by the Department of Census. According to the censes 12,191 operators were identified [4]. Kurunegala District had the highest number of ginger operators, with 2,858, followed by Kandy with 1,785, and Gampaha with 1,229. Nuwara Eliya, Kalutara, and Kegalle also reported significant numbers, with 1,189, 849, and 843 operators, respectively. On the lower end, districts such as Jaffna, Mullaitivu, and Kilinochchi had very few operators, with just 2, 2, and 1, respectively. The distribution highlights a concentration of ginger farming in the central and western regions of Sri Lanka, while the northern and eastern districts had minimal involvement in ginger cultivation.



Source: Statistics unit, Department of Export Agriculture

2.1. Analysis of cultivated extent of ginger in Sri Lanka 2006-2023

The estimated extent of ginger cultivation in Sri Lanka from 2005/2006 to 2022/2023 shows distinct trends and patterns. The table presents the estimated extent of land used for ginger cultivation in Sri Lanka from 2005/2006 to 2022/2023 (2,4). Starting with 1,360 hectares in 2005/2006, the extent gradually increased, reaching a peak of 2,488 hectares in 2015/2016. There was a notable dip (24%) in 2016/2017, when the area reduced to 1,883 hectares, followed by slight fluctuations in the following years, with the lowest point at 1,838 hectares in 2018/2019. However, from 2019/2020 onwards, the area under ginger cultivation expanded significantly, peaking at 2,817 hectares in 2021/2022. By 2022/2023, the extent slightly decreased (15%) to 2,383 hectares, indicating a minor decline in ginger cultivation after the peak years.

Figure 1 Number of Operators in Ginger Cultivations 2014

Table 1 Estimated cultivated extent of ginger in Sri Lanka

Year	Estimated Extent (ha)	Year	Estimated Extent (ha)
2005/2006	1360	2014/2015	2483
2006/2007	1530	2015/2016	2488
2007/2008	2080	2016/2017	1883
2008/2009	1892	2017/2018	1907
2009/2010	2071	2018/2019	1838
2010/2011	2400	2019/2020	2390
2011/2012	2266	2020/2021	2813
2012/2013	2276	2021/2022	2817
2013/2014	2147	2022/2023	2383

Source: Statistics unit, Department of Export Agriculture

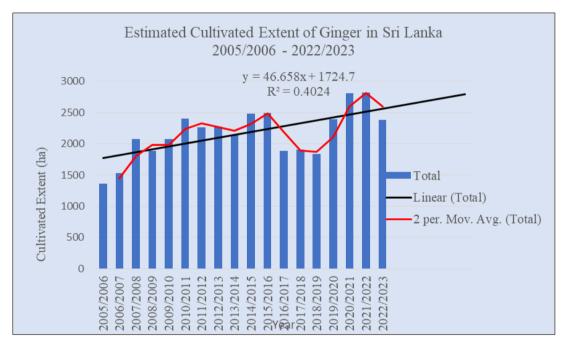


Figure 2 Estimated Cultivated Extent of Ginger in Sri Lanka

2.2. Analysis of Annual Production Volumes 2006-2023

From 2005/2006 to 2022/2023, Sri Lanka's ginger production exhibited significant fluctuations, with a general upward trend. In 2005/2006, the estimated production was 5,690 metric tons, and by 2022/2023, it had risen to 19,375 metric tons. The early years, from 2005/2006 to2010/2011, saw a steady increase, with production nearly doubling from 5,690 metric tons to 10,780 metric tons. A notable surge occurred between 2010/2011 and 2013/2014, where production consistently rose, reaching 14,911 metric tons. However, the years following 2016/2017 displayed more volatility. Although 2016/2017 saw a peak at 23,184 metric tons, the following years experienced declines and rebounds. The highest production was recorded in 2021/2022 at 25,455 metric tons, followed by a drop to 19,375 metric tons in 2022/2023. This pattern suggests that while Sri Lanka's ginger production has generally increased over the past two decades, external factors likely influenced these fluctuation.

Year	Estimated Production (mt)	Year	Estimated Production (mt)
2005/2006	5,690	2014/2015	14,075
2006/2007	6,700	2015/2016	17,273
2007/2008	6,760	2016/2017	23,184
2008/2009	8,270	2017/2018	16,326
2009/2010	10,050	2018/2019	14,753
2010/2011	10,780	2019/2020	13,785
2011/2012	12,052	2020/2021	22,705
2012/2013	13,663	2021/2022	25,455
2013/2014	14,911	2022/2023	19,375

Table 2 Estimated Raw Ginger Production in Sri Lanka 2006-2023 in Metric Tons

Source: Statistics unit, Department of Export Agriculture

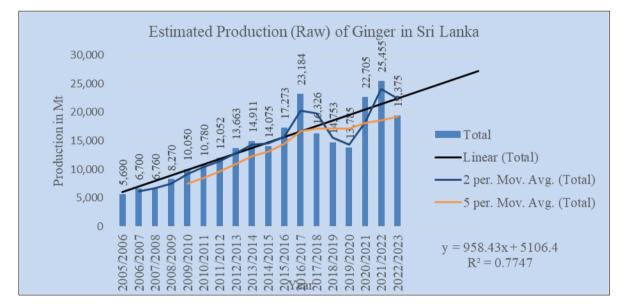


Figure 3 Estimated Raw Ginger Production in Sri Lanka 2005/2006-2022/2023 in Metric Tons

The above table 03 and figure 03 display the estimated raw production of a ginger from 2006 to 2024, a general trend of growth with some fluctuations. The data indicates a gradual increase in production from 5,690 mt in 2006 to a peak of 25,455 mt in 2022, followed by a slight decline to 19,375 mt in 2023. This growth trend, particularly evident in the substantial increases seen in 2017 (23,184 mt) and 2022, suggests improvements in agricultural practices, increased acreage, or favorable market conditions during those years. However, the fluctuations, such as the drop in production in 2018 and 2020, indicate potential challenges such as climate variability, pest outbreaks, or other environmental and economic factors. Overall, the data highlights both the opportunities for expansion and the need for addressing the underlying factors that cause production inconsistencies.

2.2.1. Identifying Trends and Patterns of Production

Analyzing the data reveals several key trends and patterns in Sri Lanka's ginger production from 2006 to 2023. Initially, there was a consistent upward trend from 2005/2006 to 2013/2014, suggesting improvements in agricultural practices or increased demand for ginger. However, the period from 2014/2015 to 2022/2023 shows a more erratic pattern, with sharp rises and falls in production. The peak in 2021/2022, followed by a decline in 2022/2023, indicates potential external influences such as weather conditions, pest infestations, or market fluctuations impacting production levels. Another noticeable trend is the resilience of ginger production despite these fluctuations, maintaining levels significantly higher than in the early 2000s. This resilience might be attributed to better farming techniques, government support, or a shift in market dynamics favoring ginger cultivation. Overall, the data highlights the importance of addressing the factors causing volatility to ensure stable growth in the future.

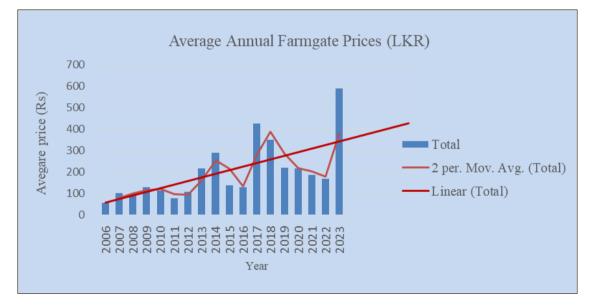
2.3. Analysis of Average Annual Farmgate prices (LKR)

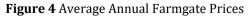
The data on ginger farm gate prices, presented in both local currency (Rs) and USD from 2006 to 2024, reveals a significant upward trend. The prices in Sri Lankan rupees show a marked increase from Rs 55.80 in 2006 to Rs 587.30 in 2023, reflecting nearly a tenfold rise. This consistent increase suggests several underlying factors, such as rising demand, inflation, or improvements in ginger quality and market value. The steep jumps in prices, particularly in 2017 (Rs 425.67) and 2023, indicate possible spikes in demand or supply shortages during those years. Similarly, the USD prices also show a substantial increase, with the most notable surge to \$4.00 in 2024.

Year	Average Farm Gate price in LKR	Year	Average Farm Gate price in LKR
2006	55.80	2016	127.12
2007	100.25	2017	425.67
2008	97.78	2018	349.09
2009	127.15	2019	218.83
2010	113.66	2020	215.96
2011	76.52	2021	186.41
2012	106.78	2022	166.32
2013	214.39	2023	587.30
2014	289.59	2024	1226.35
2015	137.72		

Table 3 Average Annual Farmgate prices (LKR)

Source: Statistics unit, Department of Export Agriculture





2.4. Analysis of Average Annual Farmgate prices (USD)

The data on ginger farm gate prices in USD from 2006 to 2024 highlights significant fluctuations, with a notable drop to the lowest price of \$0.51 in 2022. This steep decline likely indicates an oversupply or reduced market demand, which could have discouraged farmers and directly impacted the cultivation extent in subsequent years. Indeed, the data shows a reduction in cultivation extent from 2,817 hectares in 2022 to 2,383 hectares in 2023, suggesting that the low prices made ginger farming less attractive or economically viable for farmers. Conversely, by 2024, first 6 months, the farm gate price surged dramatically to \$4.00, reflecting a potential rebound in demand or a decrease in supply due to the reduced cultivation area in 2023. This pattern underscores the close relationship between farm gate prices and

cultivation decisions, where lower prices can lead to decreased cultivation extent redusing production, which in turn can drive prices higher as supply tightens.

Table 4 Average Annual Farmgate prices (USD)

Year	Average Farm Gate Price (USD)	Year	Average Farm Gate Price (USD)
2006	0.54	2016	0.87
2007	0.91	2017	2.79
2008	0.90	2018	2.15
2009	1.11	2019	1.22
2010	1.01	2020	1.16
2011	0.69	2021	0.94
2012	0.84	2022	0.51
2013	1.66	2023	1.79
2014	2.22	2024	4.00
2015	0.83		

Source: Statistics unit, Department of Export Agriculture

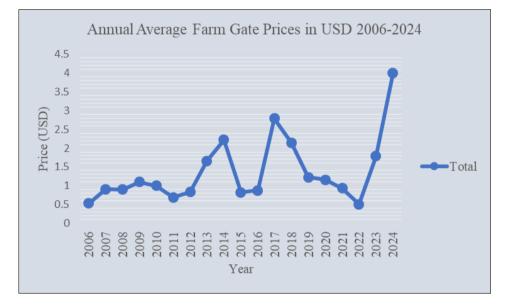


Figure 5 Average Annual Farm Gate Prices in USD

2.4.1. Correlation analysis between estimated production and estimated extent

The correlation analysis between Estimated Production and Estimated Extent shows a correlation coefficient of 0.64. This coefficient of 0.64 indicates a moderate positive correlation between the two variables. This suggests that as the area of land used for ginger cultivation increases, the production tends to increase as well, though the relationship is not perfectly linear. Other factors might be influencing the production levels as well.

2.4.2. Correlation analysis between estimated production and the farm gate prices

The correlation coefficient between the estimated production and the farm gate prices in USD is approximately 0.363. This indicates a weak positive correlation, suggesting that there is a slight tendency for farm gate prices in USD to increase as the estimated production increases, but the relationship is not strong.

The p-value is approximately 0.139, which is greater than 0.05, indicating that this correlation is not statistically significant. This suggests that the observed relationship between production and farm gate price in USD might be due to random variation rather than a meaningful connection.

2.5. Analysis of Ginger Importation

2.5.1. Imported volume of ginger to Sri Lanka 2006-2023 in metric tons

The table presents the volume of imported ginger in Sri Lanka from 2006 to 2023, showing several trends and patterns. Between 2006 and 2019, the volume of ginger imports fluctuated significantly, with notable peaks in 2007 (976.52 mt), 2013 (1,295.60 mt), and 2017 (1,731.52 mt). There were also periods of lower imports, such as in 2010 (240.69 mt) and 2011 (258.63 mt) [4]. From 2020 onward, there was a dramatic reduction in ginger imports due to the government's ban on spice imports, including ginger, as part of a policy to promote local production. This ban resulted in near-zero import volumes in 2021 (0.47 mt), 2022 (0.12 mt), and 2023 (0.80 mt), reflecting the sharp impact of the policy shift.

Table 5 Imported	Volume of Ginger to	Sri Lanka 2006-2023
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Year	Imported volume (mt)	Year	Imported volume (mt)
2006	392.34	2015	336.74
2007	976.52	2016	403.21
2008	460.92	2017	1,731.52
2009	594.01	2018	1,395.38
2010	240.69	2019	822.11
2011	258.63	2020	204.32
2012	721.60	2021	0.47
2013	1,295.60	2022	0.12
2014	691.88	2023	0.80

Source: Statistics unit, Department of Export Agriculture

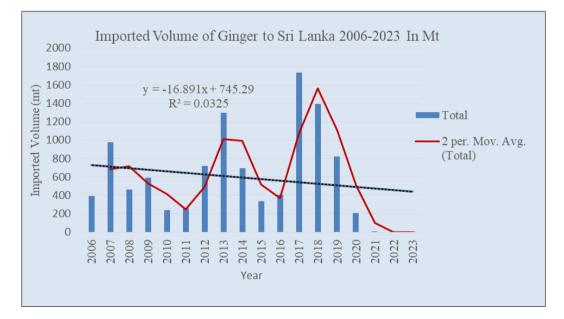


Figure 6 Imported Volume of Ginger to Sri Lanka 2006-2023

2.6. Analysis of annual exported volume of ginger

2.6.1. Annual Exported Volume of Ginger - 2006 - 2022.

The table shows the exported volume of ginger from Sri Lanka between 2006 and 2023, revealing several trends and patterns. From 2006 to 2010, the volume of ginger exports fluctuated at lower levels, ranging between 36.70 mt and 59.00 mt. However, in 2011, there was a significant surge, with exports reaching 138.80 mt, followed by an even larger peak in 2012 at 209.20 mt. After this peak, exports stabilized, fluctuating between 36.17 mt and 115.01 mt from 2013 to 2020 (9). Following the government's 2020 ban on spice imports, including ginger, export volumes remained steady, with slight increases in 2022 (128.49 mt) and 2023 (98.13 mt). This suggests that while the ban impacted imports, it did not lead to a dramatic increase in exports, which remained relatively stable in recent years.

Year	Exported Volume (mt)	Year	Exported Volume (mt)
2006	56.04	2015	66.34
2007	53.64	2016	115.01
2008	59.00	2017	81.61
2009	44.60	2018	97.17
2010	36.70	2019	36.17
2011	138.80	2020	110.49
2012	209.20	2021	113.81
2013	92.10	2022	128.49
2014	59.60	2023	98.13

Table 6 Annual Exported Volume of Ginger - 2006 – 2022

Source: Statistics unit, Department of Export Agriculture

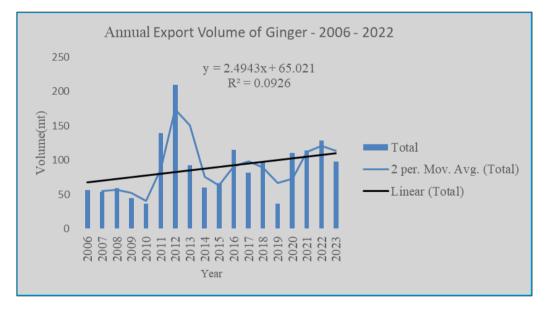


Figure 7 Annual Exported Volume of Ginger - 2006 - 2022

There appears to be a relationship between ginger imports and exports in Sri Lanka, particularly with a lag effect from previous years. From 2006 to 2019, fluctuations in import volumes often preceded changes in export volumes. For example, higher imports in 2007 and 2013 were followed by moderate export levels, suggesting that imports primarily met domestic demand. Peaks in imports, such as in 2012 and 2017, were followed by increased exports in the subsequent years, indicating that imports may have contributed to export growth. However, after the 2020 ban on ginger imports, export volumes remained relatively stable, showing that exports were driven more by domestic

production. The correlation between reduced imports in 2019 and the subsequent drop in exports suggests a connection, but the 2020 ban disrupted this pattern, making exports less reliant on imports.

2.7. Correlation analysis between ginger imports and exports in Sri Lanka

The correlation between ginger imports and exports in Sri Lanka reveals a complex relationship, particularly when considering a lag effect. Higher import volumes often preceded an increase in exports in subsequent years. For example, significant import spikes in 2007, 2012, and 2017 were followed by increased exports in the following years [8,9], indicating that imports may have supported domestic availability and boosted exports. However, this pattern was disrupted after the 2020 government ban on ginger imports. Despite imports dropping to near zero, export volumes remained relatively stable, suggesting that the export market had become less dependent on imports and more reliant on domestic production. This indicates a historical correlation, but the relationship weakened post-2020 due to policy changes.

2.8. Challenges and Opportunities of ginger production

The above production data represents the estimated production of ginger from 2006 to 2023. Below are the challenges and opportunities associated with these production trends: Challenges and Opportunities of Ginger production.

2.8.1. Fluctuations in Production

The ginger industry in Sri Lanka has experienced notable fluctuations in production, which have directly impacted market prices. Typically, when ginger prices increase, many farmers are motivated to expand their cultivation, leading to higher production in the subsequent year. However, in 2023, the lowest price of ginger (in USD) was recorded, following similarly low prices in 2021 and 2022 [3]. This led to a reduction in the cultivation extent, as farmers responded to the declining profitability. Despite these fluctuations, the demand for ginger has shown a consistent upward trend, driven by both consumption and export markets, as well as the high demand for seed ginger due to rising market prices. Furthermore, the ban on ginger imports has intensified domestic demand. Consequently, the increased demand for consumption, seeds, and export has caused a significant surge in farmgate prices in 2024.

These fluctuations can be attributed to various factors such as climate variability, pest outbreaks, and market conditions. Erratic rainfall and temperature shifts linked to climate change have affected crop yield, while pest and disease outbreaks, especially rhizome rot and bacterial wilt, have severely reduced production when not managed effectively. Additionally, volatile market forces, including fluctuating international prices, can discourage farmers from investing in ginger cultivation, leading to lower production levels during certain periods.

2.8.2. Sustainability Concerns

The dip in production raises concerns about the sustainability of ginger cultivation in Sri Lanka. To sustain the ginger industry, production should be managed according to demand. Normally local consumption has small growth. When the productivity of the farmers' ginger cultivation land increases, the cost of production decreases, so the income of the farmers can be increased. When they can produce at a low cost, they are able to provide ginger to consumers at a reasonable price. Therefore, efforts should be made to increase the productivity of farmers' land and manage demand and supply to maintain the market at a fair price. Then the ginger market will be sustainable.

2.8.3. Market Dependency

Sri Lanka's ginger industry is highly dependent on the volatile market price, making it vulnerable to price fluctuations. A drop demand or oversupply can result in reduced prices, impacting farmers' income. This market dependency can lead to inconsistent production levels as farmers may hesitate to invest in expanding cultivation when market conditions are unfavorable.

2.8.4. Climate Change Impact

Climate change has increasingly affected ginger production in Sri Lanka, with adverse weather conditions and droughts contributing to production drops in certain years. These weather anomalies not only reduce yields but also make crops more vulnerable to pests and diseases. Addressing climate change impacts through the adoption of climate-resilient agricultural practices is essential to stabilizing ginger production and ensuring long-term viability.

2.8.5. Pest and Disease Outbreaks

The ginger industry in Sri Lanka has faced significant challenges due to pest and disease outbreaks, which have caused substantial drops in production. Diseases like rhizome rot and bacterial wilt can devastate entire fields if not managed properly. The lack of effective disease control measures and limited access to disease-resistant ginger varieties make it difficult for farmers to prevent such losses. Implementing integrated pest management (IPM) practices and aware farmers with early detection techniques can help mitigate these risks and improve overall productivity.

2.9. Opportunities

2.9.1. Increasing Trends in Production

Despite the fluctuations, the ginger industry has experienced an overall upward trend in production, with a significant increase from 5,690 mt in 2006 to 25,455 mt in 2022 [3]. This growth can be attributed to improvements in farming practices, the adoption of better technologies, and possibly enhanced government support. The long-term positive trend indicates a potential for further expansion, especially if the industry can address the challenges related to climate, pests, and market dependency. Mainly ginger in Sri Lanka uses in raw form. But it has great potential to value addition and develop more products with its intrinsic quality and medicinal properties.

2.9.2. Potential for Export Growth

Sri Lanka's growing ginger production presents opportunities for expanding exports, especially as global demand for ginger increases. The steady growth in production from 2010 to 2017, and again in 2022, suggests that the country could strengthen its position in the international market. To capitalize on this opportunity, Sri Lanka will need to ensure that its ginger meets international quality standards, and introduce more value-added product to the international market with strong branding identity using its intrinsic quality and medicinal properties. With the growing global demand for organic products, there is an opportunity for Sri Lanka to market organic ginger, which can fetch higher prices.

2.9.3. Technological Advancements

Recent increases in ginger production can be linked to the adoption of technological advancements in the agricultural sector. Improved irrigation methods, pest control technologies, and modern farming techniques have contributed to higher yields and better crop quality. These innovations offer opportunities for further development, as continued technological adoption could enhance productivity and reduce production risks.

2.9.4. Government Support and Policy

Government support has played a crucial role in the growth of Sri Lanka's ginger industry. Policies aimed at providing subsidies for seeds, fertilizers, and equipment, along with training programs focused on sustainable farming practices, have contributed to increased production. Ongoing government support in the form of favorable policies, infrastructure development, and export incentives will be key to stabilizing production and addressing the challenges faced by ginger farmers.

2.9.5. Diversification

The increase in ginger production also provides opportunities for diversification into value-added products such as ginger powder, oil, health supplements and foods. By processing raw ginger into value-added products, farmers and businesses can capture more value, reduce their reliance on fluctuating raw ginger prices, and explore new market opportunities. Investments in processing industries can also create additional jobs and boost the local economy.

3. Conclusion

In summary, while the ginger industry in Sri Lanka faces several challenges, including fluctuations in production, sustainability concerns, market dependency, and climate change impacts, there are significant opportunities for growth. The overall upward trend in production, coupled with potential export growth, technological advancements, and government support, provides a positive outlook for the future. By addressing sustainability issues, adopting climate-resilient practices, and diversifying into value-added products, the ginger sector can continue to grow and become a more stable and profitable industry in Sri Lanka.

Recommendation

- Addressing the fluctuations in ginger production, particularly the declines in 2016/2017 and 2022/2023, necessitates promoting the adoption of more consistent and resilient agricultural practices. Encouraging climate-smart farming techniques can enable farmers to better manage weather variability, pest outbreaks, and other challenges that adversely impact yields. Additionally, stabilizing farm gate prices is essential, as the weak correlation between production and prices indicates that external factors, such as market demand or the influence of intermediaries, are driving price fluctuations. Introducing price stabilization measures, including the establishment of minimum support prices, partnerships/agreements with private companies, improving product quality, introducing new products, and enhancing the marketing and branding of ginger, will contribute to stabilizing the price of ginger.
- Another key area of focus should be the expansion of ginger cultivation in underutilized regions. Currently, farming is concentrated in central and western districts like Kurunegala and Kandy, while northern and eastern regions remain underrepresented. By providing financial incentives, increasing the research activities to give new recommendations, technical support, and training, farmers in these underutilized areas can be encouraged to enter ginger production, thereby increasing national production capacity and reducing regional disparities.
- To reduce dependency on imports, particularly in light of the 2020 ban on ginger imports, there is a need to boost domestic production. Providing targeted subsidies and support will help local farmers increase output and offset the reduction in imported ginger. Similarly, while export volumes have remained stable post-2020, there is potential to enhance export competitiveness by implementing quality control measures and certifications that align with international standards, ensuring that Sri Lankan ginger can secure a stronger foothold in global markets.
- Investing in value-added processing infrastructure is another key recommendation. By encouraging farmers and small-scale industries to produce ginger-based products such as ginger powder or essential oils, the ginger sector can create more stable income streams and reduce reliance on volatile raw ginger markets. At the same time, improving farm-to-market infrastructure, including transportation and storage facilities, can help reduce post-harvest losses and ensure that ginger reaches markets more efficiently, stabilizing prices for both producers and consumers.
- Given the fluctuations in production due to climate-related challenges, climate risk management strategies should be prioritized. Early warning systems, and improved irrigation practices can mitigate the impact of extreme weather conditions on ginger yields. Moreover, strengthening farmer organizations will provide farmers with collective bargaining power, improved market access, and shared resources for processing and storage, helping them navigate the volatility of the market.
- Sustainable growth in the ginger market also depends on fostering knowledge sharing among farmers, researchers, and industry professionals. Regular workshops and training sessions on sustainable farming practices, market trends, and value addition opportunities will help create a more resilient and innovative ginger sector.

Finally, import-export policies should be continuously monitored and adapted to ensure that domestic production is prioritized while maintaining a balance between imports and exports. A careful review of trade policies will help protect local farmers and stabilize the overall ginger market in Sri Lanka.

Compliance with ethical standards

Acknowledgment

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

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