Status of Ginger (*Gingiber officinale*), Large Cardamom (*Amomum subulatum*) and Tea (*Camellia sinensis*) in Koshi Province, Nepal

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**Abstract**

The study was conducted in Koshi Province in Nepal to review the status of ginger, large cardamom and tea through trend analysis and Strengths, Weakness, Opportunities and Threats (SWOT) analysis techniques. The area contribution of ginger in Koshi Province to the nation was found 34.32%, where the contribution on national production was found 36.61%. Productivity of ginger was found in the increasing trend until 2006/07, slightly decreased in 2007/08 and 2008/09, lowered in 2014/15 A.D. The area contribution of Large Cardamom in Koshi Province to the nation was found 90.9%, where the contribution on national production was found 90.8%. Productivity of Large cardamom was in the increasing trend until 2008/09, slightly decreased in 2009/10 and 2010/11, lowered in 2014/15 A.D. The area contribution of Tea in Koshi Province to the nation was found 90.26%, where the contribution on national production was found 96.73%. In 2003/04 productivity of Tea was in the increasing trend until 2013/14, slightly decreased for five consecutive years (2014/15 to 2018/19), lowered in 2016/17 A.D. All the parameters of production status (area, production, and productivity) of these commodities were found increasing in the national context. Results from study clearly revealed that, collection and auction market point establishment, fixation of minimum ceiling/floor price, value chain alliance and financing strategy and plan development, effective insurance scheme and access to loan mechanism, post-harvest handling practices at the farm level need to be developed to increase the area, production and productivity of these high value commodities in Koshi Province of Nepal which have great prospects and significance in the global markets.

**Keywords:** Area; Ginger; Large cardamom; Production; Productivity; Tea

**Introduction**

Ginger, large cardamom and tea are the principal cash crops grown in Nepal (Sedain and Aryal, 2002). Ginger and large cardamom are major spices and exportable commodities in Nepal (GRP, 2009). They have major contribution in raising the social, cultural, economic status of the rural people (NSCDP, 2007). Ginger (*Gingiber officinale*) is a high value spices grown especially in mid hills of Nepal that has a large production potential (ITC, 2007). Major ginger producing districts are Ilam, Salyan, Nawalparasi, Palpa, Morang, Kailali, Surkhet, Tanahu, and Kaski (ANSAB, 2011). The area, production and productivity of ginger in Nepal was 22441 ha, 287813 MT and 12.83 MT/ha respectively. The area, production and productivity of Ginger was 8047 ha, 112117 MT and 13.93 MT/ha respectively in Koshi province. The area, production and productivity of Ginger was 614 ha, 6790 MT and 11.54 MT/ha respectively.
1.06 MT/ha respectively in Madesh province. The area, production and productivity of Ginger was 3456 ha, 43058 MT and 12.46 MT/ha respectively in Bagmati province. The area, production and productivity of Ginger was 3759 ha, 41896 MT and 11.15 MT/ha respectively in Lumbini province. The area, production and productivity of Ginger was 2507 ha, 35157 MT and 14.03 MT/ha respectively in Karnali province. The area, production and productivity of Ginger was 1277 ha, 16374 MT and 12.82 MT/ha respectively in Sudurpaschim province (MoALD, 2023). Large cardamom (Amomum subulatum) popularly known as Alainchi in Nepali and renounced as Black Gold, Queen of Spices which belongs to Zingiberaceae family is a perennial soft-stemmed low-volume, high-value crop (Avasthe, Singh, & Tomar, 2011). It is cultivated in marginal, sloppy, and degraded land under the shade of trees (Chapagain et al., 2014). According to MoAD (2017) Taplejung, Panchthar, Ilam, Sankhuwasabha, and Terathum are the major cardamom producing districts. Large cardamom is low volume high-value crop due to which, most of the farmers in this region have shifted to the large cardamom cultivation (SNV, 2010). The Agriculture Development Strategy (2015-2035) has identified and prioritized large cardamom and ginger as the 5th and 12th sub-sector respectively among fifteen identified sub-sectors for agribusiness development through the value chain approach in Nepal (MoAD, 2014). The area, production and productivity of Large Cardamom in Nepal was 15975 ha, 8714 MT and 0.54 MT/ha respectively. The production of CTC Tea, Orthodox Tea, Green Tea and Other Tea production was 18902800 kg, 658787 kg, 732811 kg and 155960 kg respectively (MoALD, 2023). The main objective of this study is to review the status of ginger, large cardamom and tea in Koshi province through trend analysis and Strengths, Weakness, Opportunities and Threats (SWOT) analysis techniques.

Materials and Methods
Koshi province having 13 districts (3 Terai, 1 Inner Terai (Udayapur) and 9 Hills and Mountains) Nepal was chosen for study. The information used in this study was taken from several publications produced by the Ministry of Agriculture and Livestock Development, Singhadurbar, Kathmandu between 2002/03 and 2020/21. Utilizing Microsoft Excel 2013, the data thus gathered was analyzed and interpreted. Secondary data compiled and analysed using time series data published from MoALD as well as key concerned stakeholders’ consultation (Fig. 1)
Results and Discussion

Ginger

The area contribution of ginger in Koshi province to the nation is 34.32%, where the contribution on national production is 36.61%. All the parameters of production status (area, production, and productivity) are found increasing in the national context. In 2005/06 the area, production and productivity of ginger in Nepal was 12994 ha, 154197 MT and 11.87 MT/ha respectively whereas the area, production and productivity of ginger in Koshi province was 3949 ha, 54453 MT and 13.79 MT/ha, respectively. In 2005/06 Ilam was the largest producer (total area: 2151 ha; total production; 31571 MT and total productivity; 14.678 Mt/ha), followed by Morang (total area: 703 ha; total production; 8715 MT and total productivity; 12.397 Mt/ha), Taplejung (total area: 220 ha; total production; 2867 MT and total productivity; 13.032 Mt/ha), Sunsari (total area: 167 ha; total production; 2179 MT and total productivity; 13.048 Mt/ha) and Bhojpur (total area: 152 ha; total production; 2287 MT and total productivity; 15.046 Mt/ha). In 2005/06 potential districts of Ginger production were Ilam, Morang, Ilam, Taplejung, Sunsari and Bhojpur districts which is supported by ITC (2007). Productivity of ginger was in the increasing trend until 2006/07. In 2007/08 and 2008/09 productivity of ginger slightly decreased. Productivity of ginger was also lower in 2014/15 A.D. In 2019/20 the area, production and productivity of ginger in Nepal was 23500 ha, 298945 MT and 12.721 MT/ha respectively whereas the area, production and productivity of ginger in Koshi province was 8066 ha, 112421 MT and 13.938 MT/ha respectively. In 2019/20 Ilam was the largest producer (total area: 3233 ha; total production; 47500 MT and total productivity; 14.692 Mt/ha), followed by Morang (total area: 977 ha; total production; 10766 MT and total productivity; 11.019 Mt/ha), Panchthar (total area: 719 ha; total production; 9915 MT and total productivity; 13.790 Mt/ha), Sunsari (total area: 540 ha; total production; 5580 MT and total productivity; 10.333 Mt/ha), Udaypur (total area: 518 ha; total production; 9972 MT and total productivity; 19.251 Mt/ha), Bhojpur (total area: 365 ha; total production; 4380 MT and total productivity; 12.000 Mt/ha) and Taplejung (total area: 324 ha; total production; 5100 MT and total productivity; 15.741 Mt/ha). Potential districts of Ginger production in Nepal are Ilam, Morang, Ilam, Taplejung, Sunsari and Bhojpur districts which is inline with ANSAB (2011) (Fig. 2, 3 & 4)
Large Cardamom

Large cardamom is an economically important low volume high-value crop due to which, most of the farmers in Koshi province have shifted to the large cardamom cultivation. Compared to the traditional crops, the income from large cardamom is three to four times higher (SNV, 2010). The International Centre for Integrated Mountain Development (ICIMOD, 2016) reported that, over 21,960 households are engaged in large cardamom farming in Nepal. At present, Nepal is the largest producer of large cardamom with a 68 percent share in the global market, followed by India (22%) and Bhutan (9%). The area contribution of large cardamom in Koshi Province to the nation is 90.9%, where the contribution on national production is 90.8%. Large cardamom has been a prioritized crop by Nepal Trade Integration Strategy (NTIS) and Agriculture Development Strategy (ADS, 2015-2035). All the parameters of production status (area, production, and productivity) are found increasing in the national context supported by ITC (2017). In 2005/06 the area, production and productivity of large cardamom in Nepal was 11,498 ha, 6,646 MT and 0.578 MT/ha respectively whereas the area, production and productivity of ginger in Koshi province was 11,238 ha, 6,505 MT and 0.579 MT/ha respectively. In 2005/06 Taplejung was the largest producer (total area: 2,151 ha; total production: 991 MT and total productivity: 0.370 Mt/ha), Sankhuwasava (total area: 2,187 ha; total production: 1221 MT and total productivity: 0.558 Mt/ha), Panchthar (total area: 1,576 ha; total production: 1016 MT and total productivity: 0.645 Mt/ha) and Terathum (total area: 605 ha; total production: 319 MT and total productivity: 0.527 Mt/ha). In 2005/06 potential districts of large cardamom production were Taplejung, Ilam, Sankhuwasava, Panchthar and Terathum districts. Productivity of large cardamom was in the increasing trend until 2008/09. In 2009/10 and 2010/11 productivity of large cardamom slightly decreased. Productivity of large cardamom was also lower in 2014/15 A.D. In 2020/21 the area, production and productivity of large cardamom in Nepal was 16,041 ha, 8,386 MT and 620 MT/ha respectively whereas the area, production and productivity of large cardamom in Koshi province was 14,105 ha, 7,475 MT and 0.619 Mt/ha respectively. In 2020/21 Taplejung was the largest producer (total area: 4,258 ha; total production: 2,960 MT and total productivity: 0.695 Mt/ha), followed by Panchthar (total area: 3,232 ha; total production: 1,196 MT and total productivity: 11.019 Mt/ha), Panchthar (total area: 719 ha; total production: 9,915 MT and total productivity: 0.370 Mt/ha), Sankhuwasava (total area: 2,350 ha; total production: 917 MT and total productivity: 0.390 Mt/ha), Terathum (total area: 600 ha; total production: 304 MT and total productivity: 0.507 Mt/ha). In 2020/21 potential districts of large cardamom production in Nepal are Taplejung, Panchthar, Sankhuwasava, and Terathum districts (Fig. 5, 6 & 7).
**Tea**

The area contribution of Tea in Koshi Province to the nation is 90.26%, where the contribution on national production is 96.73%. All the parameters of production status (area, production, and productivity) are found increasing in the national context. In 2003/04 the area, production and productivity of Tea in Nepal was 15012 ha, 11651 MT and 0.776 MT/ha respectively whereas the area, production and productivity of Tea in Koshi province was 14178 ha, 11616 MT and 0.819 MT/ha respectively. In 2003/04 Jhapa was the largest producer (total area: 8323 ha; total production; 10060 MT and total productivity; 1.20 Mt/ha), followed by Ilam (total area: 4651 ha; total production; 1286 MT and total productivity; 0.278 Mt/ha), Panchthar (total area: 794 ha; total production; 170 MT and total productivity; 0.21 Mt/ha), Dhankuta (total area: 319 ha; total production; 80 MT and total productivity; 0.250 Mt/ha) and Terathum (total area: 111 ha; total production; 20 MT and total productivity; 0.180 Mt/ha). In 2003/04 potential districts of Tea production were Jhapa, Ilam, Panchthar, Dhankuta and Terathum districts. Productivity of Tea was in the increasing trend until 2013/14 which is supported by Dhakal and Dahal (2016). Productivity of Tea slightly decreased for five consecutive years (2014/15 to 2018/19). Productivity of Tea was also lower in 2016/17 A.D. In 2019/20 the area, production and productivity of Tea in Nepal was 16041 ha, 8386 MT and 0.619 MT/ha respectively whereas the area, production and productivity of ginger in Koshi province was 14105 ha, 7475 MT and 0.619 MT/ha respectively. In 2019/20 jhapa was the largest producer (total area: 7340 ha; total production; 17429 MT and total productivity; 2.375 Mt/ha), followed by Ilam (total area: 7236 ha; total production; 6535 MT and total productivity; 0.903 Mt/ha), Panchthar (total area: 674 ha; total production; 56 MT and total productivity; 0.083 Mt/ha), Dhankuta (total area: 383 ha; total production; 36 MT and total productivity; 0.093 Mt/ha) and Terathum (total area: 123 ha; total production; 19 MT and total productivity; 0.093 Mt/ha). In
2019/20 potential districts of Tea production were Jhapa, Ilam, Panchthar, Dhankuta and Terathum districts (Fig. 8 & 9).

**SWOT Analysis of Ginger, Large Cardamom and Tea Production and Marketing**

Strength, weakness, opportunities, and threats (SWOT) analysis of ginger, large cardamom and tea in the Koshi province is presented in Table 1. The hilly terrain and poor infrastructure and poor upgrading practices were the main hindrances in ginger, large cardamom and tea trade. Diseases and pests, price variation, lack of improved drying, curing, and packing methods at the farm level, many collectors, and high market margin were major constraints and threats in ginger, large cardamom and tea production. The SWOT analysis indicates that there were many challenges of ginger, large cardamom and tea production and marketing in Nepal.

![Table 1: SWOT analysis of ginger, large cardamom and tea production and marketing in the study area](image)

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>Favorable agro-climatic condition</td>
<td>Ageing of crop and poor maintenance result into declining yield</td>
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<tr>
<td>Traditional knowledge on cultivation; High value crop and use of sloppy upland with fruits</td>
<td>Increasing mortality rate due to disease and pests</td>
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<tr>
<td>Suitable crop for small and marginalized famers.</td>
<td>Lack of proper knowledge on cultivation practice sorting/grading</td>
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<td>Successful cultivation practices already carried out in different parts of Nepal</td>
<td>Inconsistency quality of product</td>
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<tr>
<td>High market demand in international markets</td>
<td>Non-existence of auction practice</td>
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<tr>
<td>High benefit cost ratio and profit margin</td>
<td>Weak bargaining capacity of farmers</td>
</tr>
<tr>
<td>Large number of producers and traders</td>
<td>Dependency on foreign market</td>
</tr>
<tr>
<td>Long productive period and storage life</td>
<td>Weak extension services to transfer technology</td>
</tr>
<tr>
<td>Low investment to obtain regular inflow of cash income</td>
<td>Lack of good quality of storage facility</td>
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<td></td>
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<tr>
<td>Opportunities</td>
<td>Threats</td>
</tr>
<tr>
<td>Appropriate climate and geography suitability</td>
<td>Declining labor availability</td>
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<tr>
<td>Good demand in international and national markets</td>
<td>Double taxation system</td>
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<tr>
<td>Value adding opportunities through grading, tail cutting, cleaning, curing and smoke-free improved drying</td>
<td>Incidence of pest and diseases</td>
</tr>
<tr>
<td>High willingness of farmers</td>
<td>District Forest Office has stopped large cardamom production in community forest due to its threat in biodiversity</td>
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<td>Prioritized crops in the country</td>
<td>Domestic consumption is very low</td>
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<td></td>
<td>Declining international reputation due to poor quality (residual effects of insecticides/pesticides)</td>
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<td>Intense competition from neighboring countries</td>
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<td>Lack of skilled technical manpower</td>
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<td>Uncertainty in price fixation</td>
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<td>Gradual increment in use of chemicals instead of suitable organic method</td>
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</table>

![Fig. 8: Tea area and production in 14 districts of Province 1 in 2019/2020](image)

![Fig. 9: Trend of ginger production in Koshi Province and national level (in MT)](image)
Conclusion
A study in Koshi province in Nepal reviewed the status of ginger, large cardamom and tea through trend analysis and Strengths, Weakness, Opportunities and Threats (SWOT) analysis techniques concluded collection and auction market point establishment, fixation of minimum ceiling/ floor price, value chain alliance and financing strategy and plan development, effective insurance scheme and access to loan mechanism, development of post-harvest handling practices at the farm level need to be focused by policy maker to increase the area, production and productivity of these commodities in Koshi province of Nepal which have great prospects and significance in the global markets. Koshi province having 13 districts (3 Terai, 1 Inner Terai (Udayapur) and 9 Hills and Mountains) Nepal was chosen for study. The information used in this study was taken from several publications produced by the Ministry of Agriculture and Livestock Development, Singhadurbar, Kathmandu between 2002/03 and 2020/21. Utilizing Microsoft Excel 2013, the data thus gathered was analyzed and interpreted. Secondary data compiled and analysed using time series data published from MoALD as well as key concerned stakeholders' consultation The study found that the area contribution of ginger in Koshi province to the nation is 34.32%, where the contribution on national production is 36.61%. All the parameters of production status (area, production, and productivity) are found increasing in the national context. Productivity of ginger was in the increasing trend until 2006/07. In 2007/08 and 2008/09 productivity of ginger slightly decreased. Productivity of ginger was also lower in 2014/15 A.D. In 2019/20 potential districts of Ginger production in Nepal are Ilam, Morang, Ilam, Taplejung, Sunsari and Bhojpur districts. The area contribution of Large Cardamom in Koshi Province to the nation is 90.9%, where the contribution on national production is 90.8%. All the parameters of production status (area, production, and productivity) are found increasing in the national context. Productivity of Large cardamom was in the increasing trend until 2008/09. In 2009/10 and 2010/11 productivity of large cardamom slightly decreased. Productivity of Large Cardamom was also lower in 2014/15 A.D. In 2020/21 potential districts of large cardamom production in Nepal are Taplejung, Panchthar, Sankhuwasava, and Terathum districts. The area contribution of Tea in Koshi Province to the nation is 90.26%, where the contribution on national production is 96.73%. All the parameters of production status (area, production, and productivity) are found increasing in the national context. In 2003/04 productivity of Tea was in the increasing trend until 2013/14. Productivity of Tea slightly decreased for five consecutive years (2014/15 to 2018/19). Productivity of Tea was also lower in 2016/17 A.D. In 2019/20 the area, production and productivity of Tea in Nepal was 16041 ha, 8386 MT and 620 MT/ha respectively whereas the area, production and productivity of ginger in Koshi province was 14105 ha, 7475 MT and 0.619 MT/ha respectively. In 2019/20 potential districts of Tea production were Jhapa, Ilam, Panchthar, Dhankuta and Terathum districts. The results of this research provide information that is important in national policy making. Moreover, the government would consider short-term strategies that offset post-harvest management practices of ginger, large cardamom and tea to capture net social benefits and competitiveness of quality products in the global market. On the other hand, government interventions to improve the training, access to credit, and technical service facility as well as encourage more profit-oriented behavior by farmers are necessary to enhance technology adoption of post-harvest practices of ginger, large cardamom and tea in the long-run. The results can significantly contribute to improve the ginger, large cardamom and tea producers, traders, and consumer policy and developing effective ginger, large cardamom and tea value-added practices for the global market. Furthermore, policy makers and researchers need to focus on significant factors determining the WTP of Nepalese ginger, large cardamom and tea considering socio-demographic, institutional, economics, and preferences variables, mainly brand, certification, quality, process products, and size.

Recommendation
Based on the findings of status of ginger, large cardamom and tea on Koshi province, the following recommendations were made which could be useful to the policy makers.

Policy makers
- Ginger, large cardamom and tea collection and auction market point establishment need to be developed in the niche production area for sustainable production and global value chain development in international markets.
- The minimum ceiling/ floor price needs to be fixed based on the record of cost-benefit analysis at the major production level of ginger, large cardamom and tea.
- Local, provincial, and national level ginger, large cardamom and tea production and value chain alliance and financing strategy and plan need to be developed for effective participatory market system development.
- An effective insurance scheme and access to loan mechanism for marginal farmers need to be established for business promotion of ginger, large cardamom and tea.
- Post-harvest handling practices at the farm level namely, improved drying and curing, tail cutting, grading based on size and color, packaging need to be developed in collaboration of local, provincial, and national government bodies in an effective and participatory manner.

Full text of this paper can be downloaded online at www.ijssm.org/ & http://nepjol.info/index.php/IJSSM/issue/archive
• Global demand is based on consumers' preferences and supply records via an app system needs to be established at the national level for ginger, large cardamom, and tea market promotion.

Authors’ Contribution
R. Poudel, R.R. Kattel and S.C. Dhakal designed the research plan, collected the required data, analyzed the data and also prepared the manuscript. Final form of manuscript was approved by all authors.

Conflict of Interest
The authors declare that there is no conflict of interest with present publication.

Acknowledgements
The authors are thankful to all the supporting hands for making this study successful.

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