

## Production Economics of Ginger (*Zingiber officinale* Rosc.) in Doti District, Nepal

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### How to cite this article:

Sandesh Dahal, Binod Adhikari, Hari Poudel, Anima Pokhrel/Production Economics of Ginger (*Zingiber officinale* Rosc.) in Doti District, Nepal/Indian Journal of Agriculture Business 2021;7(2):53-56.

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### Abstract

Ginger is one of the major spice crops that contribute substantially in rural people livelihood across the mid-hills of Nepal. Despite being a high-value crop, it is cultivated at a subsistence level and hence the farmers are less benefited than expected. So, a study was conducted to investigate the economics of ginger farming in Doti district. A total of 60 respondents were selected randomly from the purposive sampling frame of ginger growers in Joroyal rural municipality. A semi-structured questionnaire, Focus Group Discussion (FGD), Key Informant Interview (KII), and field observations were used to obtain primary data. And published documents from governmental and non-governmental organizations were used as secondary sources of data. The obtained data were analyzed using SPSS and MS-Excel. The findings revealed that the average area under ginger cultivation as 1.87 ropani with a productivity of 18.18 Mt/ha. The average cost of cultivation was found to be NRs 30669.65 with the B:C ratio of 1.63. The marketing margin of NRs 34.17 was observed with 59.88% of producer share in consumer price. Thus, ginger farming in Doti district was found to be profitable which needs to be commercialized for better profits. w

**Keywords:** Production cost; B:C ratio; Profit; Rural livelihood.

### Introduction

Ginger is one of the most important spice crops, traditionally grown in the mid-hills of Nepal, for the generation of cash incomes. Ginger has the potential to enhance rural people's socio-economic situation by increasing their income as a high-value spice crop (NSCDP 2007) having high export potential (HVAP 2011). So, it has been taken as one of the major sectors in supporting the livelihood of rural people, especially to poor, marginal, and disadvantaged communities who are engaged in agriculture (USAID Nepal 2011).

Nepal is the fourth largest country in terms of ginger production after India, China, and Indonesia (Zoder 2017). In Nepal, the ginger was cultivated over the area of 23,000 hector (ha) of land which

produced about 284,000 Metric Ton (MT) in the year 2017/18(MoALD 2018). It contributed about 1.3% of total exports with an export value of about 509 million NRs in 2012/13(TEPC 2018). Ginger is one of the nineteen commodities having high export potentials in Nepal (NTIS 2016). About 75% of the Nepalese ginger is traded in fresh form and the remaining 25% in processed form, mainly as 'sutho' & powdered ginger, almost all to India only (about 99%)(TEPC 2018).

Doti is only the sixth most ginger-producing district in Nepal after Illam, Salyan, Palpa, Nawalprasi, and Morang although it has higher productivity than other major districts (NSCDP, 2014). The total area under ginger production in Doti in fiscal year (FY) was 715 ha that produced



about 10725 MT (MoALD 2018). In the FY 2014/15, the production of ginger in Doti was 16050 MT in the total area of 1070 ha that shared about 60% of the total production of the Far-West region of Nepal (MoALD 2017). After then, the area under cultivation and production have declined in Doti although it has a higher productivity (15 MT/ha) than national average productivity (12.3 MT/ha) (MoALD 2018).

Agricultural growth is a crucial aspect in reducing poverty in Nepal, and increasing market research and product development can help to commercialize the country's agriculture industry (MoAD 2015). Despite being the backbone to rural community livelihood improvement, the profitability of this sub-sector is rarely investigated. Farmers being cultivating in limited fragmented land, the problems of timely availability of input, labor crisis and high cost of production, inefficient marketing channel and lower margin to farmers are most prevalent (Chalise et al. 2019; Mahat et al. 2019; Poudel et al. 2016). However, very few studies have been done focusing on the economic sector of ginger production in Nepal. So, to minimize this gap, a present study was done to analyze the economics of ginger production in ginger zone of the country.

## Materials and Methods

### Study area

Doti is the major district that contributes to ginger production in Sudurpasschim Province (Province -7) of Nepal. Realizing its potential, Prime Minister Agriculture Modernization Project (PMAMP) has recently established a ginger zone in Doti with the coverage area in Joroyal and Badikedar Rural Municipality. The study was conducted on Joroyal Rural Municipality, ward number 2, 4, and 6 as they come under the area of the ginger zone in Doti.

### Sources of data

The farmers were interviewed with a pre-tested semi-structured questionnaire, which served as a primary source of data. Besides, the secondary data was collected from documents published by government bodies, NGOs and INGOs, and several published research articles. In addition to this, focus group discussion (FGD), key informant interview (KII), and field observation were done to verify the collected data.

### Sample size and sampling techniques

The ginger growers of Joroyal rural municipality,

wards 2, 4 and 6 were selected as a sample population for the study. Based on the information from the zone profile, major ginger growers which were above 21 years were selected purposively for more reliable, realistic, and complete information. Among them, a total of 60 farmers were selected for study purpose by simple random sampling technique.

### Data Analysis

All the collected data were carefully inspected and refined. After then, they were coded and entered into the computer software. Data entry was done by using Software Package, Statistical Package for Social Science (SPSS), and Microsoft excel sheet. Then, the data was analyzed to draw purposeful outcomes. The following information was analyzed during the study.

#### Cost of production

The total cost of cultivation was calculated using the following formula.

$$\text{Total cost} = \sum \text{variable cost} + \sum \text{fixed cost}$$

The variable cost included the farm expenditures on seed, land preparation, fertilizers & manure, pesticides, planting, mulching, weeding, irrigation, harvesting, packaging, transportation, and labor. The fixed cost here included the taxes, depreciation, and maintenance cost. These costs were listed as miscellaneous cost, as exact information was missing regarding these costs.

#### Benefit cost analysis

For benefit cost analysis, total costs of production of ginger and total gross return from the product were used and calculated as

$$\text{"B/C" ratio} = \frac{\text{Gross return from the product}}{\text{Total cost of cultivation}}$$

Where, gross return from the product = Quantity of ginger produced (kg) \* Price (per kg)

#### Profit analysis

The profit is the difference between total revenue and total cost incurred. Thus, net profit was calculated as:

$$\text{Net profit} = \text{Total return (revenue)} - \text{Total cost}$$

Marketing margin and producer's share

The difference between the farm-gate price (price obtained by the producers) and the retailer's price (price paid by the consumers) is known as marketing margin. It was calculated as:

Marketing margin=Retailer’s price (Pr)- Farm gate price (Pf)

Similarly, producer’s share is the price received by the farmer expressed as a percentage of the retailer’s price. It was calculated as:

$$\text{Producer's Share (Ps)} = \frac{\text{farm gate price(Pf)}}{\text{retailer price(Pr)}} \times 100$$

## Result and Discussion

### Production and productivity of ginger

The study site had an area of 1.87 ropani of land under ginger cultivation on average with the production of 1730 kg of fresh ginger (Table 1). The productivity of ginger was found to be 18.18 Mt/ha which is higher than the national average of 12.34 Mt/ha and average productivity of the district, 15 MT/ha in 2017/18 (MoALD 2018). The study site has high productivity as it has suitable climatic conditions and soil characteristics.

Table 1: Area and production of ginger in Doti.

Variable	N	Mean Value
Area under cultivation	60	1.87 (ropani)
Production	60	1730 kg

Source: Field Survey, 2020

## Economic Analysis

### Cost and benefit analysis

The cost of cultivation was calculated based on variable cost of cultivation of ginger in 1 ropani of land in the study area. The variable cost includes the input cost, management cost, and harvesting cost. It was found that the average production cost of ginger in 1 ropani was NRs 30669.65 (Table 2).

Among different variable costs, the cost of seed covered about one-third of the total cost of production. The farmers were unknown about the seed treatments and hence did not carry out any seed treatment techniques. The farmers in the study area did not use any extra source of water apart from rainfall for irrigation in the ginger field. Similarly, the locally available mulching materials like bamboo leaves, dried weeds, and dry tree leaves were utilized for mulching purpose. Hence, seed treatment, irrigation, and mulching had no contribution to production cost.

The total return from ginger farming was estimated to be NRS 49900 per ropani. This resulted in B:C ratio of 1.63 which signifies that the ginger

farming in the study area is profitable. Similar profitability was reported in ginger cultivation in different parts of Nepal (Acharya et al. 2019; Poudel et al. 2016) including major hill districts (Bhandari, Kunwar, and Parajuli 2015). The B:C ratio was found to be lower than that of Sunsari district (2.06) as observed by Chalise et al., 2019.

Table 2: Cost of Production and Benefit of Ginger in Doti.

Particular	Total Cost (NRS)	Remarks
Seed treatment cost	0.00	No seed treatment was done
Seed cost	20200.00	
Land preparation cost	2449.15	
Planting cost	1583.33	
Mulching cost	0.00	Local resources were used
FYM cost	2579.17	
Weeding cost	1608.00	
Irrigation cost	0.00	Only rainfall was used
Harvesting cost	1750.00	
Miscellaneous	500.00	Coverage for fixed cost
Total cost of production (per ropani)	30669.65	
Total return (per ropani)	49900.00	
B:C ratio	1.63	

Source: Field Survey, 2020.

## Profit Analysis

Table 3: Profit of ginger farming in Doti.

Particulars	Amount
Total Cost (TC)	30699.65
Total Revenue	49900.00
Net Profit	19200.35

Source: Field Survey, 2020

On calculating the net profit from ginger farming, it was found that the farmers had a net profit of NRS 19200.35 from one ropani of land in a year. So, ginger farming is one of the major sources of income for the farmers of the study area.

### Marketing margin and producers share

The efficiency of marketing system was reflected by marketing margin and producers share. The marketing system operates efficiently when there is a lower marketing margin and higher producer share of consumer price. The present study revealed

that there was a higher gap (NRS 34.17) between the cost paid by the consumer (NRS 85.17) and price received by a farmer (NRS 51). Due to this low farm gate price and higher marketing margin, the producer share in consumer price was moderate (59.88%). Similar results were observed by Timsina, 2009 but the results were different from the findings of Khanal, 2018 who reported a marketing margin of NRS 94 and only 14.55% of the producer's share in ginger. This satisfactory result might be due to the short marketing channel, and accessible market availability in the study area.

**Table 4:** Marketing margin and producer's share of ginger farmers in Doti.

Particulars	Amount (NRs)
Farm gate price (per kg)	51
Retailer's price (per kg)	85.17
Marketing margin	34.17
Producer's share	59.88%

Source: Field Survey, 2020

## Conclusion

The study concludes that ginger farming is done at the subsistence level even though it has the high profitability as indicated by B:C ratio of 1.63 in ginger farming. So, by developing farming at a commercial scale, ginger cultivation can be developed as a means to improve the livelihood of the people of the study area. Efficient marketing channels should be developed to decrease the marketing margin and increase producer share in consumer price. Still, the research can be done covering a larger area involving commercial growers.

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