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ORIGINAL RESEARCH ARTICLE



## Socio-economic analysis of coffee growers in Gulmi district of Nepal

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### ABSTRACT

Coffee is a major plantation cash crop of hills of Nepal. Gulmi is one of the popular districts for coffee production and export in Nepal. This research is an attempt to assess the production potentiality and profitability of coffee in Gulmi district. This study was carried out in four rural municipalities of Gulmi district namely Ruru rural municipality, Dhurkot rural municipality, Satyawoti rural municipality and Musikot municipality. A total of 100 samples (25 from each rural municipality) were selected using simple random sampling technique. Face to face (FtF) interview method was used to collect primary data using pretested semi-structured questionnaire. The economic indicators of coffee production like gross revenue, gross margin, benefit-cost ratio (BCR) and profitability index (PI) were calculated. BCR and PI were found to be  $2.84 \pm 0.59$  and  $2.50 \pm 1.25$ , respectively. Gross margin per ropani was calculated to be NRs.  $15675.29 \pm 7189.72$ . The contribution of coffee in total household income was 12% in Gulmi showing it to be one of the major influencing commodities. The major production problem was found to be insect attack in the district while the major marketing problem was the low market price. The insights of this research were that coffee has the potentiality to uplift the rural income of Gulmi but at the same time there were poor extension services for coffee growers such that farmers had shown dissatisfaction towards coffee enterprise. Therefore, effective package of production and value chain monitoring should be introduced by the Nepal government in order to address the production and marketing constraints of coffee producers.

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### INTRODUCTION

Coffee is a plantation crop grown in mid hills of Nepal (Tuladhar and Khanal, 2018). It belongs to the family Rubiaceae. All the coffee produced in Nepal is of arabica variety (NTCDB, 2021). Mr. Hira Giri, a hermit was the first man to introduce coffee in Nepal in 1938 AD. He had brought some coffee seeds from the Myanmar and planted in Aapchaur of Gulmi district of Nepal. But it remains unnoticed for about 40 years and only after the late 70s, it had spread from one farmer to another. In late 70s, Government of Nepal imported coffee seeds from India and distributed among the farmers for its commercial cultivation. In the mid 80s, Nepal Coffee Company was established in Manigram, Rupandehi district. After its

establishment, the coffee producers were able to sell the coffee. Since the year 2002, Nepali coffee gained much popularity in the national as well as the international market. Presently, coffee is grown in the 40 districts of mid hills of Nepal with commercial cultivation in 21 districts (NTCDB, 2021). The optimum temperature, rainfall and altitude for arabica variety are 20-24°C, 1200-1500 mm/year and > 1000 masl respectively (FAO, 2005).

The major coffee growing districts of Nepal are Tanahu, Palpa, Gulmi, Parbat, Lalitpur, Kaski, Baglung, Gorkha, Sindhupalchowk, Kavre, Syangja, Argakhanchi and Lamjung (DoA, 2017). The total area of coffee production is 2761 ha. and total production of green beans is 530 MT in the year 2019/20 (MoALD, 2021). This equals to approximately 1.87% of the

total area of Nepal. About 65% of the Nepali coffee is exported and the rest 35% is processed, packaged and supplied to the domestic market (Tiwari, 2010). Nepal imports coffee every year from India, China, Brazil, Thailand, Myanmar, Italy and Korea. About 99% of the total coffee import is from the India alone. Nepal has high potentiality for coffee production especially in the mid hill region because of the presence of suitable climate and topography. Nepali coffee is considered as a specialty coffee for its distinct flavor, aroma and body as it is grown in higher altitude (NTCDB, 2021). The distinct flavor and aroma of the Nepali coffee is because of the combined effect of chilly autumns of the mid hilly region and the soil in which it is grown. According to a report from the National Tea and Coffee Board, Nepalese coffee is ranked seventh in the world in terms of taste (Shrestha, 2014). The excellent quality cupping and pleasing aroma of Nepalese highland and organic coffee have made them well-known in foreign markets (Poudel et al., 2009).

Coffee is nearly three times more profitable as compared to other cash crops and nearly five times more profitable than cereal crops (Dhakal, 2004). Coffee business can be the suitable and financially feasible business in the mid hills of Nepal (Acharya et al., 2015). In the context of developing countries like Nepal, cash crops play a pivotal role in changing the living standard of the rural Nepalese farmers. Among many cash crops cultivated in Nepal, coffee is a low volume high value cash crop which has got immense potentiality in trade surplus of Nepal. Coffee alone contributes about 0.04 percent to the total GDP (PSS, 2004). The total coffee production area in Gulmi is 160 ha with the production of 35 MT of green beans, yield 219 kg/ha and the total number of farming households being 1790 (DoA, 2017). This data shows that coffee has a significant place in the farming system of Gulmi district. Because it is difficult for farmers to get fertilizers, insecticides, and other pesticides, coffee grown in rural Nepal is generally regarded as being "organic by default" (Tuladhar and Khanal, 2018). Due to its superior quality, Nepalese coffee often costs 3.5 times as much as Indian coffee on the global market (Bastola, 2007).

Despite its crucial role in uplifting the rural economy of Nepal, coffee production is facing a sharp setback in the marketing and certification. Besides this, there are problems like low input supply and unavailability of inputs in time, insect pest attack, irrigation problems, lack of technical knowledge and low government support. Because of lack of organized marketing channels, there is a discrepancy between what policies have indicated and what has been executed in the actual areas for the promotion of coffee (Tiwari, 2010). The lack of research in coffee is preventing it from becoming a sustainable industry for producers, processors, and merchants (Shrestha, 2004). Gulmi district is a popular coffee growing district of Nepal and the economic analysis of coffee production in Gulmi is still lacking. So there is a gap between research, extension and the coffee growers. The findings of this study are useful for coffee grow-

ers and also for the workers involved in the development field. This study also helps the concerned stakeholders to develop the plans and policies in making the coffee production as a profitable enterprise. There are few researches that have been conducted in the past. In this connection, this research was designed to study not only the problems in coffee industry but also to evaluate the impact of these problems in the economics of coffee production and marketing. Gulmi, being a major coffee production district of Nepal, it is appropriate to do rapid study on present production economics, income activities, production and marketing limits, marketing structure, and value addition. The major objective of this study was to identify the economic return from coffee enterprise and constraints associated with it in Gulmi district of Nepal.

## MATERIALS AND METHODS

### Study area

The survey was conducted in Gulmi district where the coffee was first planted in Nepal. Gulmi with its headquarter, Tamghas, covers an area of 1149 km<sup>2</sup>. Gulmi is located at 28.0889° N and 83.2934° E. The population of Gulmi is 268,597 (CBS, 2017). This study was carried out in four rural municipality of Gulmi district namely Ruru rural municipality, Dhurkot rural municipality, Satyawoti rural municipality and Musikot municipality. These municipalities have higher number of coffee growers in Gulmi and Musikot municipality has the highest number of coffee growers in Gulmi (P. Gautam, personal communication, August 12, 2022). These municipalities are popular for coffee production and a major portion of coffee export by Nepal comes from Gulmi district. The coffee production in Gulmi is around 24 tonnes (Chaudhary and Bastakoti, 2021). Gulmi alone exported 12 tonnes of coffee, and both domestic and export demand are rising there (Nyaupane, 2018).

### Sample size, sampling technique, data collection and analysis

The total of 100 samples (25 from each rural municipality) was selected using simple random sampling technique. Face to face interview (FtF) method was used to collect primary data using pretested semi-structured questionnaire. Data about socioeconomic information, variable cost incurred in production, gross margin, benefit-cost ratio, profitability index from coffee were collected during survey. Altogether, two Focus Group Discussions (FGDs), each on one VDC, and key informant interview (KII) were conducted to validate information obtained from respondents. Secondary data were collected from various published articles, government publications, various books, web sites, etc. The data collected were entered into MS Excel 2013. The descriptive statistics like mean and standard deviation were calculated using MS Excel 2013. The data representation by using tables and bar diagrams was done by using MS Excel 2013.

### Analytical models used in the study

**Gross revenue analysis:** Gross revenue (GR) is the total amount of sales done by a business within a particular period. It does not include any deductions. It indicates the sales capacity of a business. Gross revenue is also called as gross sales.

Gross revenue = Quantity sold (kg) × Average price per kg

**Gross margin analysis:** Gross margin (GM) is the difference between Gross revenue (GR) and Total Variable Costs (TVC). It is used as a farm planning tool in case of small scale farm enterprise where fixed capital is generally negligible.

GM = GR - TVC

GR = price of cherry per kg × total quantity sold (kg)

TVC = total costs on the variable inputs used during production.

Net profit = GM - Total Fixed Cost (TFC) = GR - TVC - TFC = GR - Total Costs (TC)

Note: TFC from the land was considered as zero if the land is owned by the farmer. Hence, TC equals the TVC.

Acharya and Dhakal (2014) also used the same formula to calculate the gross margin.

**Benefit - cost ratio analysis:** Benefit - cost ratio (BCR) is a profitability indicator which compares the present value of all the benefits obtained from the enterprise to the present value of all the costs incurred during the production process.

BCR = Gross revenue/Total cost

Where,

BCR = Benefit - cost ratio

Sharma et al. (2016) also used the same formula to calculate the BC ratio

Decision rule:

BCR < 1 production should not be carried out

BCR = 1 neither profit nor loss. Can create profit if managed properly

BCR > 1 production should go on

**Profitability index analysis:** Profitability index measures how much feasible it is to undertake the proposed project or the production process by comparing the total initial costs involved and the discounted cash flow. It is the ratio of present value of the future cash flows to the initial investment incurred.

PI = Net profit or net farm income / TVC

Where, PI is profitability index

Acharya and Dhakal (2014) also used the same formula to calculate the profitability index.

Decision rule:

PI < 1 investment should be avoided

PI = 1 indifferent result

PI > 1 investment is encouraged

**Severity index:** Severity index helps in ranking the various problems and thus helps in prioritizing of problems. A definite scaling technique is used in indexing the problems. Scaling technique measures the attitude and extremity of the respondent towards any proposition (Bastola, 2007). Scale values like 1, (1- 1/n), (1- 2/n), (1- 3/n), (1- 4/n), ....., (1- n/n) are used to rank the problems in scaling technique, where n= number of categories in ranking (Acharya & Dhakal, 2014).

Here, we are using a four point scaling technique as 1, 0.75, 0.50, 0.25 (put n = 4) which equivalents to extremely severe, severe, moderate and slight respectively. The severity index was calculated by using the following formula:

$$\text{Severity Index (I)} = \sum \frac{S_i \times f_i}{N}$$

Where,

$S_i$  = Scale value at  $i^{\text{th}}$  severity

$f_i$  = frequency of the  $i^{\text{th}}$  severity

N = total number of respondents

The value of I lies between 0 and 1 i.e.  $0 < I < 1$ .

## RESULTS AND DISCUSSION

### Characteristics of coffee growers

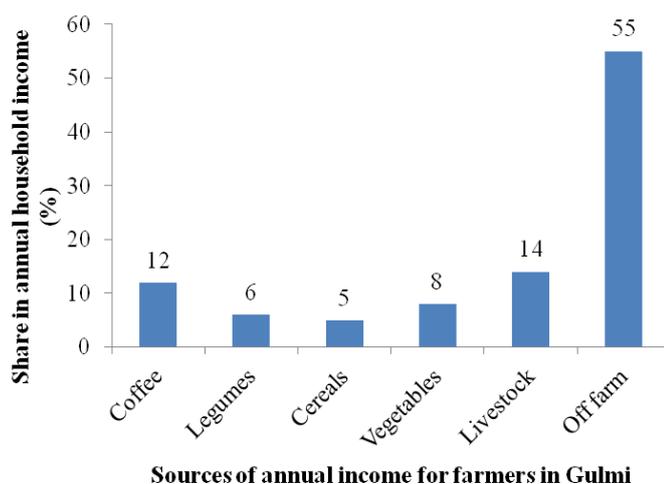
Male members (51.16%) were higher than female members (48.84%) (Table 1). Male respondents were higher than female respondents in the district (Table 1). The family size of the study area was found to be 5.59. The proportion of non-economically active population and economically active population was found to have significant difference in the study area. The population age group of 15-59 years is economically active population. The economically active population was found to be 42.93% in Gulmi (Table 1). Majority of household heads in the district were Brahmin, followed by Chhetri (Table 2). Majority of households were Hindu followed by Buddhist and Christian (Table 2). Major proportions of the household members were found that they were studying in primary level education. Approximately half of the members after completing the secondary level have entered into the higher education in the district (Table 2). Level of education significantly influenced the selection of coffee processing methods in Gulmi (Paudel and Parajuli, 2020). It was found that the majority of the household members were engaged in agriculture production (Table 2). The area, production, and productivity of coffee in Gulmi was found to be 7.033 ropani, 1.87 t, and 0.3 t/ropani (Table 2). The proportion of male respondents was higher than the female in Gulmi district (Table 1). This result is similar to the findings of Karki et al. (2018). However, Khanal et al. (2019) found that gender of the household head has no any significant impact on the productivity of coffee. On the other hand, gender of the household head had the significant impact on the selection of the coffee processing methods (Paudel and Parajuli, 2020).

**Table 1.** Population distribution in Gulmi district (Survey, 2021).

Gender	Sample (n=100)	
	Frequency	Percent
Male members	286	51.16
Female members	273	48.84
Male respondents	65	65
Female respondents	35	35
Economically active population	240	42.93
Non- economically active population	319	57.07
Total sampled population (N)	559	100
Family size (N/n)	5.59	

**Table 2.** Socioeconomic characteristics of coffee growers in Gulmi district (Survey, 2021).

Characteristics	Frequency	Percent
Ethnicity of household head		
Brahmin	50	50
Chhetri	33	33
Janajati	7	7
Dalit	10	10
Religion of household head		
Hindu	90	90
Buddhist	7	7
Christian	3	3
Education Status of household members		
Illiterate	30	5.37
Read and write	80	14.31
Primary education	216	38.64
Secondary education	156	27.91
Higher education	77	13.77
Primary occupation of household members		
Agriculture	316	56.53
Business	40	7.15
Government service	90	16.10
Remittance	80	14.31
Private company	4	0.72
NGO/INGO	29	5.19
Production status		
Area (ropani)		7.033
Production (t)		1.87
Productivity (t/ropani)		0.3

**Figure 1.** Percentage share of coffee in annual household income.

The family size of the study area was found to be 5.59 in Gulmi (Table 1). Family size of the study area determines the availability of labors to the production process (Sharma et al., 2015). The average family size of the district was found higher than

that of national average family size (Table 1). The national average family size is 4.60 in 2016 (CBS, 2017). Male headed households and the families with growers having higher education were found more inclined towards adopting of modern technologies in coffee production, orchard management, and processing (Survey, 2021).

#### Economic analysis of coffee production

An average of  $1660 \pm 300.97$  kg of coffee was sold in Gulmi during the previous season and the average price was NRs.  $81.50 \pm 2.33$ . Hence, the average gross revenue of Gulmi was found to be NRs.  $135325 \pm 25035.94$  (Table 3). Similarly, the average gross margin of was found to be NRs.  $97225 \pm 26627.42$  and the gross margin per ropani was NRs.  $15675.29 \pm 7189.72$ . The average BCR of Gulmi was  $2.84 \pm 0.59$  which was found to be higher than 1 (Table 3). The average profitability index of Gulmi  $2.50 \pm 1.25$  which showed that coffee had been a profitable enterprise among coffee growers of Gulmi (Table 3). The percentage share of coffee in annual household income in Gulmi was found to be 12% (Figure 1).

**Table 3.** Analysis for different economic variables of coffee production in Gulmi district.

Variables	Mean±SD
Quantity of coffee sold (kg)	1660 ± 300.97
Average price per kg (NRs)	81.50 ± 2.33
Gross revenue (NRs)	135325 ± 25035.94
Total variable cost (NRs)	38100 ± 11692.05
Gross margin (NRs)	97225± 26627.42
Area of production (ropani)	7.03± 2.49
Gross margin per ropani (NRs/ropani)	15675.29 ± 7189.72
Total cost (NRs)	50380± 18624.81
BCR	2.84± 0.59
Net profit (NRs)	84945± 25072.06
Profitability index	2.50± 1.25

**Table 4.** Production problems of coffee in Gulmi district.

Production problems	Index value	Rank
Poor quality seedlings	0.036	V
Poor soil fertility	0.028	VII
Unavailability of inputs on time	0.023	X
Lack of fertilizer	0.044	II
Lack of pesticides	0.031	VI
Insect and disease attack	0.066	I
Lack of technical knowledge and extension	0.039	IV
Lack of irrigation	0.025	IX
Lack of crop insurance	0.041	III
Unavailability of labour	0.028	VIII

**Table 5.** Marketing problems of coffee in Gulmi district.

Marketing problems	Index value	Rank
Low market price	0.062	I
Lack of transportation	0.050	V
Lack of organized market facility	0.041	VI
Lack of market information	0.039	VII
Lack of effective processing methods	0.028	VIII
No certification	0.053	II
Low quality product	0.027	IX
Presence of middlemen	0.051	IV
Low production compared to the demand	0.052	III
Low consumer preference	0.019	X

The highest share in the annual household income was from off farm sources 55%. Cereals and legumes are also produced in substantial amount in Gulmi but they are significantly used for home consumption. The average variable cost was NRs. 38100 ± 11692.05 whereas Bhattarai *et al.* (2020) reported that Gulmi had average variable cost of NRs. 2272.02 per ropani. Gross revenue per ropani in coffee production was found to be NRs. 13093 and variable cost NRs. 4194 (Bastola, 2007). The gross revenue from green bean of coffee was 610.25 ± 59.06 per kg with SD = 102.30kg (Luitel, 2017). Coffee production in Gulmi is satisfactory due to appropriate orchard management system. Poudel *et al.* (2009) found that the gross margin was NRs. 4119.13 per farm. Pandit (2008) found the gross margin was NRs. 119129.70/ha. According to a research, the average total cost of fresh coffee cherry production per ropani per year was NRs. 6383.36 and the variable cost was NRs.4577.64 while average gross return was NRs. 11535.71 (Kattel *et al.*, 2009). Gulmi has Benefit-Cost Ratio greater than 1 which indicates coffee production as a profitable enterprise (Sharma

*et al.*, 2016). Similar results were obtained by Bastola (2007). The profitability index was 1.47 in Palpa district (Acharya and Dhakal, 2014) while it was 1.23 in Parbat as reported by Sharma *et al.* (2016) and on the basis of our findings it can be inferred that Gulmi outperformed these neighbouring districts (Table 3). The off farm income was found to increase with increase in family size which is similar to the results obtained by Sharma *et al.* (2015). More than 10% share in the annual household income shows a good sign of commercialization of any commodity (Sharma *et al.*, 2016). Acharya and Dhakal (2014) reported that coffee contributes 10% to the household income in nearby regions of Gulmi district. Coffee alone contributes 16.26% to the annual household income (Sharma *et al.*, 2016). Similar results were obtained by Kattel *et al.* (2009) and Pandit (2008).

#### Production and marketing constraints of coffee production

Through the severity index, comparative ranking of problems of the district was done. Insect and disease attack was the most prevailing production problem to the district. The second

most occurring problem in Gulmi was lack of fertilizer (Table 4). We have found that lack of crop insurance was ranked to be one of the top three issues of coffee production which indicates that farmers have now become aware of the crop insurance policies. Unavailability of inputs on time was the least occurring problem in Gulmi (Table 4). Low market price was the most severe marketing problem (Table 5). Also, no certification of produced coffee was recorded the second most important marketing problem. The least important marketing problem to the district was found to be low consumer preference (Table 5). The incidence of insect and disease has been the major constraint of coffee production (Table 4). Acharya and Dhakal (2014) also came up with the similar results. The major production problems of coffee in Nepal were pest attack followed by poor quality seedlings (Pandit, 2008) while white stem borer (*Xylotrechus quadripes*), in particular, was the major problem according to Kattel et al. (2009). Unavailability of skilled labour followed by farm yard manure unavailability followed by insect pest attack were the first, the second and the third problems in Gulmi, as reported by Poudel et al. (2009). Lack of irrigation, lack of knowledge and disease and insect attack were the top three problems (Sharma et al., 2016). Low market price was the second severe problem only after the pest attack (Acharya et al., 2015). Low market price, transportation and no certification were ranked as the top three severe marketing problems in coffee production (Sharma et al., 2016). The majority of coffee is exported through direct interactions between traders as opposed to formalized marketing channels (Tiwari, 2010). This indicates the lack of organized market channel in Gulmi. Although certification is crucial for organic coffee, not enough has been done in this area. In reality, there is currently no well-established procedure for the certification of organic coffee. Nevertheless, international organizations like JAS, Japan, and NASAA, Australia are active in the certification of organic coffee in Gulmi (Tiwari, 2010). 85% of coffee growers in Gulmi practice wet processing methods and 15% practice sun drying of unpulped coffee, however lack of hand pulpers and other machineries was the major problem in coffee processing in Gulmi district (Paudel and Parajuli, 2020).

## Conclusion

The B/C ratio and profitability index showed that coffee is a profitable enterprise in Gulmi. Gross margin and net profits are also higher than the average in Gulmi. However, production and productivity of coffee was found to be lower than its potential because of insect pest attack and lack of fertilizer. Gulmi has got a huge scope for coffee business with higher net profit and gross margin. The export potential of coffee is also high in Gulmi as the coffee produced here is organic and processed mainly by wet processing methods. Nevertheless, coffee growers are much dissatisfied with the current market price so the value chain of coffee is needed to be monitored so that farmers could get the proper price for their produce. All stakeholders involved in the value chain of coffee are needed to co-operate

with each other. Moreover, there is increased risk of loss of coffee from the white borer in Gulmi. An innovative package of production needs to be introduced in Gulmi including quality seedlings, orchard management, processing and marketing of coffee.

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## REFERENCES

- Acharya, B., & Dhakal, S. C. (2014). Profitability and Major Problems of Coffee Production in Palpa District, Nepal. *International Journal of Applied Sciences and Biotechnology* 2(4), 460-463, <https://doi.org/10.3126/ijasbt.v2i4.11252>
- Acharya, B., Dhakal, S., Pant, S., & D.Dhakal. (2015). Profitability and resource use efficiency of coffee production in Palpa district, Nepal. *Technical Publication Thesis Grants*, 11-22.
- Bastola, U. (2007). Economics of coffee production, processing and marketing: policy implications and prospects of commercialization in Nepal. M.Sc. Thesis. Kathmandu, Bagmati Pradesh, Nepal: Institute of Agriculture and Animal Science, Tribhuvan University.
- Bhattarai, C., Bhusal, K., Bhandari, D., Gautam, A., Bhandari, S., & Bhujel, S. (2020). Economic Analysis of Coffee Production in Arghakhanchi and Gulmi Districts of Nepal. *Food and Agribusiness Management*, 1(1), 39–42, <https://doi.org/10.26480/fabm.01.2020.39.42>
- Central Bureau of Statistics (CBS) (2017). *Statistical Year Book 2017*. Central Bureau of Statistics. Retrieved from <https://cbs.gov.np>
- Chaudhary, S., & Bastakoti, N. (2021). *Money from coffee cherry skins*. The Kathmandu Post. <https://kathmandupost.com/columns/2021/12/23/money-from-coffee-cherry-skins>
- Dhakal B. (2004). *Coffee Manual*. Kathmandu, National Tea and Coffee Development Board.
- Department of Agriculture (DoA) (2017). *Statistical Information On Nepalese Agriculture*, Ministry of Agriculture and Livestock Development.
- FAO. (2005, August). *Arabica coffee manual for Lao-PDR*. Retrieved February 11, 2021, from Food and Agriculture Organization: <http://www.fao.org>
- Karki, Y.K., Regmi, P.P. & Thapa, R.B. (2018). Coffee Production in Kavre and Lalitpur Districts, Nepal. *Journal of Nepal Agricultural Research Council* 4, 72–78, <https://doi.org/10.3126/jnarc.v4i1.19692>
- Kattel, R. R., Jena, P. & Grote, U. (2009). The impact of coffee production on Nepali smallholders in the value chain. *Institute of Environmental Economics and World Trade*, Leibniz Universitate. Hannover, Germany.
- Khanal, A. P., Khanal, S., Dutta J. P., Dhakal S. C. & Kattel R. R. (2019). An assessment of factors determining the productivity of coffee in western hills of Nepal. *International Journal of Agricultural Sciences and Veterinary Medicine* 7 (2), 11–17, Retrieved from <https://www.researchgate.net/publication/333479102%0AAn>
- Luitel, G. (2017). Value Chain Analysis of Coffee Production in Central Nepal. MSc. Thesis.
- Ministry of Agriculture and Livestock Development (MoALD) (2021). *Krisi Diary*. Lalitpur, Ministry of Agriculture and Livestock Development.
- National Tea and Coffee Development Board (NTCDB) (2021). *Nepali Coffee*. National Tea and Coffee Development Board. Retrieved from <https://www.teacoffee.gov.np/>
- Nyaupane, M. P. (2018). *29 tons of coffee exported from Gulmi and Palpa*. MyRepublica. <https://myrepublica.nagariknetwork.com/news/29-tons-of-coffee-exported-from-gulmi-palpa/>

- Pandit, J. (2008). Export potentiality of organic coffee production in Nepal. M.Sc. Thesis.
- Paudel, M, & Parajuli, K. (2020). Constraints and Determinants of Coffee Processing Methods in Gulmi District, Nepal. *International Journal of Applied Sciences and Biotechnology* 8(3), 368-373, <https://doi.org/10.3126/ijasbt.v8i3.31565>
- Poudel, K. L., Poudel, A., Nepal, B. D., Sugimoto, Y., Yamamoto, N. & Nishiwaki, A. (2009). Capital Budgeting Analysis of Organic Coffee Production in Gulmi District of Nepal. University of Miyazaki. Faculty of Agriculture. Department of Environment and Resource Sciences, Interdisciplinary Graduate School for Agriculture and Engineering. Laboratory of Agricultural Economics.
- Postgraduate Student Society (PSS) (2004). Postgraduate Student Society. Krishi Sandesh.
- Sharma, G.P., Pandit, R., White, B. & Polyakov, M. (2015). The income diversification strategies of smallholder coffee producers in Nepal (No. 1784-2016-141876). <https://doi.org/10.22004/ag.econ.207693>
- Sharma, S., Dhakal, C. K., Ghimire, B. & Rijal, A. (2016). Economic Significance of Coffee (*Coffea arabica*) Production in Parbat District of Nepal. *International Journal of Agricultural Management and Development* 6(2), 123-130.
- Shrestha, P. (2014). *Taking Nepali Coffee To The World*. Retrieved from <http://ventureplus.com.np>
- Shrestha, P. M. (2004). Role of Coffee as a cash crop to uplift the livelihood of farmers in the mid-hills of Nepal. In: *Proceedings of the third national horticultural seminar on environment protection and poverty reduction through horticulture development* April, 18-19, 2004, 57-63. Nepal Horticulture Society. Kathmandu, Nepal.
- Tiwari, K.P. (2010). Agricultural policy review for coffee promotion in Nepal. *Journal of Agriculture and Environment* 11, 138-147, <https://doi.org/10.3126/aej.v11i0.3661>
- Tuladhar, A. & Khanal D. R. (2018). Coffee production in Nepal-a brief review. In *II International Symposium on Beverage Crops* 1274, 161-166, <https://doi.org/10.17660/ActaHortic.2020.1274.21>