Volume: 6, Issue: 2, (Dec, 2024), pp 38-52
foa.rjt.ac.lk/sljae

SRI LANKAN JOURNAL OF AGRICULTURE AND ECOSYSTEMS *e*ISSN: 2673-1401

SLJAE

ORIGINAL ARTICLE

Comparative Economic Analysis of the Production of Different Rapeseed Varieties in Dang District, Nepal

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DOI: https://doi.org/10.4038/sljae.v6i2.127

Abstract

The Rapeseed is an important oilseed crop in Nepal, contributing significantly to rural livelihoods. Despite its potential, limited studies have analyzed the comparative profitability of improved and local rapeseed varieties. This study was conducted in 2022 to analyze the profitability in the production of two different rapeseed varieties in Dang district. Ninety-five rapeseed growers from three rural municipalities and Tulsipur Sub Metropolitan were selected through stratified random sampling method. Primary data were collected through household surveys using semi-structured questionnaires, while secondary data were collected through different journals, articles, websites, publications and reports of PMAMP (Prime Minister Agriculture Modernization Project) and AKC (Agriculture Knowledge Centre). Two rapeseed varieties namely *Unnati* (improved variety) and *Ghobi tori* (local variety) were considered during this study. The average productivity was higher for *Unnati* (0.93 Mt/ha) than *Ghobi tori* (0.67 Mt/ha). The total cost of production for *Unnati* was NRs 57,577.07 per ha and that for *Ghobi tori* was NRs 59,208.66 per ha. Gross return and net profit per hectare were NRs 105,586.34 and NRs 47,989.25 for *Unnati* and NRs 75,098.61 and NRs 16,926.67 for *Ghobi* tori. The benefit cost ratio for *Unnati* was 1.83 whereas the benefit cost ratio for *Ghobi* tori was 1.29, which indicated that both varieties were profitable. Unavailability of timely inputs and limited irrigation facilities were the key problems in the production of rapeseeds in the study area.

Keywords*: Benefit-cost ratio, Ghobi tori variety, Rapeseed, Unnati variety*

Date of Submission: 04.09.2024 Date of Acceptance: 20.12.2024

1. Introduction

Oilseed is one of the important cash crops in Nepal. Nine oilseed crops are mainly cultivated in Nepal: rapeseed, mustard, groundnut, soybean, sunflower, safflower, sesame, linseed and nigerseed (Rajbhandari & Bhatta 2008). Major oilseed producing districts are Kailali, Dang, Chitwan, Morang, Banke, Sarlahi and Sunsari (MOALD 2022). Oilseed occupies 260,645 hectares of land with the production of 287,334 mt. and productivity of 1.10 mt/ha (MOALD 2022).

Rapeseed, popularly known as *tori,* is a dominant crop among oilseed crops in Nepal which belongs to family Cruciferae. It is the major oilseed crop in terms of area, production and productivity. It occupies 198,985 hectares of land with production 220,784 mt and productivity 1.11 mt/ha (MOALD 2022). Dang is one of the leading districts in terms of rapeseed production. Rapeseed is cultivated in around 19,300 ha with production around 22,643 tons and yield 1.10 mt per ha in Dang district in 2022 (MOALD 2022). Rapeseed is normally cultivated as a *rabi* crop in Nepal as it requires relatively cooler temperature for seed setting and oil formation (Pokhrel 2019). The agro-climatic and geographic conditions of Dang district support the production of rapeseed, with cooler temperatures during the growing season. Two major varieties of rapeseed grown in Dang district are *Unnati (Brassica campestris var toria)* and *Ghobi tori (Brassica napus var napus). Unnati* variety of rapeseed is a short duration crop while *Ghobi tori* variety is a long duration crop (Chauhan 2020). Rapeseed is mainly grown in upland condition after monsoon maize while it is grown after early rice in lowlands (Yadav 2020).

Although both rapeseeds are cultivated in large area, farmers are not able to get optimum benefits from rapeseed cultivation in Dang district. The production and productivity of rapeseeds in Nepal is considerably lower as compared to the world productivity (Ranabhat 2021). Limited access of farmers to inputs i.e., high-quality seeds, fertilizers, insufficient irrigation facilities and incidence of diseases and pests are major problems on production of rapeseed in Kailali district (Pokhrel 2019). Factors limiting rapeseed production in SAARC (South Asian Association for Regional Cooperation) countries including Nepal are weather fluctuation, degraded soil status, non-availability of quality seeds, low investment and slow pace of technology adoption (Kumar & Kumar 2005). Farmers basically cultivate rapeseeds just to use the fallow land after major cereals like rice and maize under energy starvation condition with less input due to which the production of rapeseed is lower (Nepali & Bhandari 2019). Because of the cultivation under rainfed conditions and in marginal land, the production and productivity of oilseeds is low (Choudhary, Yadav, & Singh 2009). Besides, the sub-optimal doses of chemical fertilizers and non-adoption of plant protection measures also results in low productivity of rapeseeds (Choudhary, Yadav, & Singh 2009). It is necessary to increase the total production of rapeseed in existing cropping system in order to get maximum profit by optimum utilization of production factors (Miah 2014).

Rapeseed is one of the important cash crops of Dang district which has not been grown to its optimum potential. Different production factors are responsible for the production of rapeseed which has not been studied thoroughly. In order to enhance the productivity of rapeseed, the improved and high yielding varieties, technological adoption, irrigation, proper fertilization, price support and effective extension are of utmost important (Sonvanee & Pathak 2014). The rapeseed growers are using local seed for rapeseed production cultivation (Pokhrel 2019). The study on production economics and profitability analysis will help to find out a way for farmers to gain maximum return from rapeseed production by the use of minimum production factors (Sampa, Sarkar, & Rahman 2020).

Although Dang district is the potential producer of rapeseed from climatic perspective, little research has been made before that can address the actual problem of farmers in rapeseed growing areas of Dang. A problem-based study is much needed for the production of rapeseed and adoption of technology in the district. This study focused on the comparative economic analysis of improved and local rapeseed varieties in Dang district. Keeping on this general objective, this study was conducted in Dang district with the following specific objectives:

i. To assess the socio-demographic status of rapeseed producers in the study area
ii. To conduct the cost of production analysis
iii. To estimate the returns of two rapeseed varieties
iv. To identify and rank the problems associated with rapeseed production in the study area

2. Materials and Methods

2.1 Study Area and Sampling Design

The study was conducted in Dang district which lies in Lumbini province. The research area included Shantinagar Rural Municipality, Babai Rural Municipality, Dangisaran Rural Municipality and Tulsipur Sub-Metropolitan ward number 1 and 2 (Figure1). These areas were selected for the research study as these areas are designated as the zone for oilseed under Prime Minister Agriculture Modernization Project (PMAMP), Project Implementation Unit (PIU), Dang. These areas were identified as the areas of the highest production and productivity of oilseeds (both *Unnati* variety and *Ghobi tori*) in the district (MOALD 2022).

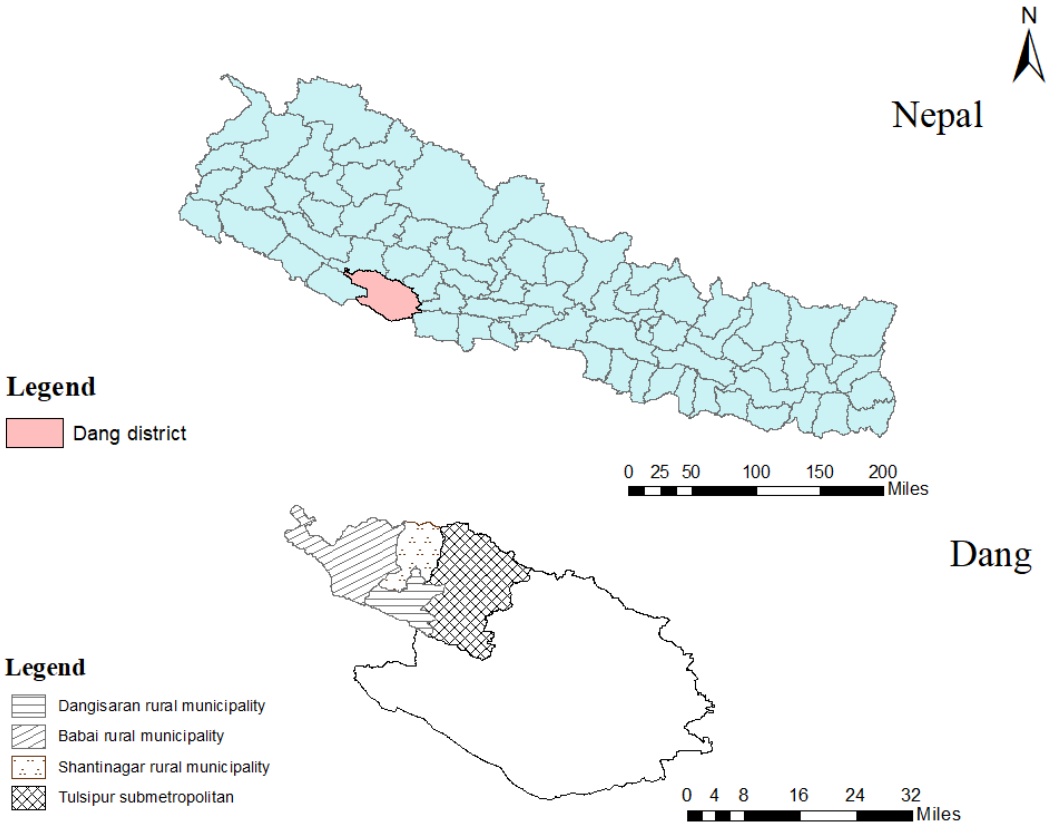

Figure 1: Map of Nepal and Dang district showing study areas

2.2 Sampling and Data Collection Methods

The sampling frame comprised 1900 registered rapeseed growers in the study site under PMAMP, Oilseed Zone. Stratified random sampling method was used to select the sampled household. A sample number of 95 were taken at 10% level of significance of total registered farmers under PMAMP, PIU, Oilseed Zone. The sample size was determined using Yamane's formula:

$$n = \frac{N}{1+Ne^2}$$

Where:

n = sample size

N = population size (1900)

e = margin of error (0.10)

Primary data were collected from the farmers with the help of pre-tested questionnaire through household survey, focus group discussions (FGD), key informant interviews (KII) and field observations. FGDs involved progressive farmers to explore production

constraints, while KIIs included local agricultural experts and stakeholders. The primary data gave brief overview about cropping system of respondents, land holding, production expenditure, marketing process, problems of cultivation, etc. Secondary data was collected from various published and unpublished secondary sources of data, PMAMP (PIU), AKC, oilseed zone committee, Central Bureau of Statistics (CBS), MOALD, Nepal Agriculture Research Council (NARC), related reports, journals and books. The secondary data provided information related to production, market trend, price behavior, etc.

A preliminary survey was conducted to gather information regarding the demographic, topographic, socio-economic conditions, production practices, and marketing trends of the site. The insights from this survey were used to help define the sampling frame and to develop sampling strategy and interview schedule for the main household survey. The interview schedule was pre-tested prior to household survey to assess its reliability and validity. This was done by interviewing five respondents of the sample size outside the study area. Based on the response, necessary changes were made to the questionnaires. Face-to-face interviews were conducted with the selected respondents using a semi-structured questionnaire. Respondents were asked for detailed information related to rapeseed production practices and associated variables.

Both qualitative and quantitative data were collected during survey. The qualitative data provided information related to farmer's perception of rapeseeds, management practices in rapeseeds cultivation, problems in rapeseeds cultivation, etc. The quantitative data provided information on inputs used, costs of productions, and revenue generated from rapeseed cultivation. The qualitative data was either analyzed thematically or transformed into quantifiable indicators to support further statistical analysis. The collected quantitative data were analyzed by using descriptive statistics (mean, standard deviation, frequency, percentage) and analytical tools such as cost-benefit analysis and gross margin analysis.

2.3 Data Analysis and Economic Evaluation

The collected data were first coded, cleaned and analyzed using MS Excel and SPSS (Statistical Package for Social Science). Socio demographic and farm characteristics were analyzed and described by using different descriptive statistical techniques. Variables like gender of respondents, age, ethnicity, family size, education status, source of income, land holding size, etc were analyzed using simple descriptive statistics such as means, frequencies and percentage.

The average area under cultivation and average production per household were computed based on the total cultivated land and production data obtained from household surveys. Productivity was calculated using the formula:

$$Productivity\ (Mt/ha) = \frac{Average\ Production\ per\ household(Mt)}{Average\ Area\ under\ Cultivation\ per\ household(ha)}$$

Economic evaluation included cost and return analysis. The total cost of production was analyzed by calculating the variable cost items and the fixed costs. The variable cost included seed, labor, tractor, pesticide, fertilizer, irrigation and harvesting. The fixed cost included land rent.

$$Total\ variable\ cost = C_{seed} + C_{labor} + C_{land\text{-}prep} + C_{pesti} + C_{ferti} + C_{irri} + C_{har}$$

where, C_{seed} =cost of seed

C_{labor} = cost of labor

$C_{land\text{-}prep}$ = costs for land preparation

C_{pesti} = cost for pesticides

C_{ferti} = cost of fertilizers

C_{har} = harvesting cost

$$Total\ cost = Total\ Fixed\ Cost + Total\ Variable\ Cost$$

Benefit cost ratio is the ratio of gross revenue with total cost and BCR was estimated accordingly.

$$B{:}C = \frac{Gross\ return}{total\ \text{cost}}$$

Gross return (NRs) was calculated by multiplying the total output (mt) by average market price (NRS/mt). Similarly, gross margin was calculated as the difference between gross return and total cost.

$$Gross\ Return = Total\ Output * P$$
$$Gross\ Margin = Gross\ return - Total\ cost$$

Qualitative data was used to prepare the index. Problem for the production of rapeseed (both *Unnati* and *Ghobi tori*) were ranked with the help of forced ranking technique using five-point scaling technique. The problems were ranked into very high, high, moderate, low and very low. The following formula was used to calculate the index for the intensity of problem:

$$I_{imp} = \sum \frac{Si\ fi}{N}$$

where, I_{imp} = index of importance

S_i = I^{th} scale value

f_i = frequency of i^{th} importance

N = total number of respondents

3. Results and Discussion

3.1 Socio-economic Characteristics of the Respondent Households

The socio-economic characteristics associated with the adoption of rapeseed technology include age, sex, education level, family type, family size, land holding size and other related factors.

3.1.1 Age of the respondents

All respondents were classified into three categories according to age: (i) 16-39 (ii) 40-59 (iii) above 60 (Table 1). Nearly 50 percent of the farmers were in the age group of 40-59 years. The mean age of the respondents is 44.1 for *Unnati* variety and 43.3 for *Ghobi tori.* The analysis of the age of household head revealed that majority of the sampled household heads involved in rapeseeds production were within economically active age group.

Table 1: Age of the respondents

Rapeseed varieties / Age groups	*Unnati* farmers Frequency	*Ghobi tori* farmers Frequency
Between 16-39 years	18 (36)	17 (37.78)
Between 40 -59 years	24(48)	22 (48.89)
Above 60 years	8 (16)	6 (13.33)
Total	50 (100)	45 (100)

Figure in parenthesis represents percentage to their respective totals

3.1.2 Gender Distribution of Respondents

The study revealed that majority of the respondents were male for both Unnati (60%) and Ghobi tori (60%) (Table 2). Similarly, the female respondents for both Unnati and Ghobi tori were 40%. The result showed the dominance of male in household in rapeseed cultivation. It showed that female headed households were very low in the production of rapeseeds which indicates the prevalence of gender discrimination in decision making at household level in the study sites.

Table 2: Gender distribution of respondents

Gender	Unnati variety Frequency	Ghobi tori variety Frequency
Male	30(60)	27(60)
Female	20(40)	18(40)

Figure in parenthesis represents percentage to their respective totals

3.1.3 Education Level of Respondents

Education level of respondents was categorized into four different groups; illiterate, informal education, upto SLC (School Leaving Certificate) and above SLC (Table 3). Analysis of the educational status showed that most of the respondents were educated upto SLC level.

Table 3: Education level of respondents

Education status of respondents	Unnati variety		Ghobi tori	
	Frequency	Percent (%)	Frequency	Percent (%)
Illiterate	12	24	9	18
Informal education	10	20	12	24
Upto SLC	19	38	16	32
SLC and above	9	18	8	16

3.1.4 Ethnicity of Respondents

More than 60% of the farmers were from Brahmin/Chhetri communities (Table 4). From the study, it can be concluded that the involvement of marginal community (like Dalit) of Nepal in the rapeseeds production was very low and they were still could not come in the mainstream of agricultural commercialization.

Table 4:Ethnicity of household in study area

Ethnicity of respondents	*Unnati tori*		*Ghobi tori*	
	Frequency	Percent (%)	Frequency	Percent (%)
Brahmin	10	20	9	20
Chhetri	21	42	18	40
Janjati	14	28	15	33.33
Dalit	5	10	3	6.67

3.1.5 Distribution of Respondents based on Occupation

The study indicated that the major source of income in the survey area was agriculture (66%) followed by services (18%) for *Unnati* while agriculture (75.56%) and services (13.33%) for *Ghobi tori* (Table 5). Proportion of respondents involving in business and abroad is low. This shows that agriculture remains the backbone of economy for majority of people.

Table 5: Distribution of respondents based on occupation

Occupation of the respondents	*Unnati* variety		*Ghobi tori*	
	Frequency	Percent (%)	Frequency	Percent (%)
Agriculture	33	66	34	75.56
Business	5	10	3	6.67
Services	9	18	6	13.33
Remittance	3	6	2	4.44

3.2 Rapeseed Cultivated Land

In the study site, farmers mostly cultivated in their own piece of land and only few cultivated in leased land. *Unnati* is mostly cultivated in upland (*bari*) while *Ghobi tori* is mostly cultivated in upland (*khet*). The total cultivated land per household under *Unnati* variety in the research area was found to be 0.687 ha and the average cultivated land for *Unnati* was 0.386 ha. Similarly, for *Ghobi tori*, the total cultivated land by farmers per household in the study area was found to be 0.526 ha. Of which, the average cultivated land for *Ghobi tori* was 0.305 ha.

3.3 Source of Inputs for Rapeseed Production

The inputs required for rapeseed production—fertilizers, seeds, pesticides, tillage and threshing equipment—were accessed from different sources as shown in Table 6. A comparative overview between *Unnati* and *Ghobi tori* varieties reveals contrasts in input sourcing and usage patterns.

Table 6: Source of inputs for rapeseed production

Particulars	Source	*Unnati* variety	*Ghobi tori*
		Frequency	Frequency
Chemical fertilizers	Agrovets	15(30)	12(26.67)
	Co-operatives	30(60)	20(44.44)
	Others	5(10)	3(6.67)
	Not using	0(0)	10(22.22)
Seeds	Own	8(16)	45(100)
	Zone/AKC	42(84)	0(0)
Pesticides	Agro-vets	25(50)	12(26.67)
	Zone/AKC	15(30)	8(17.78)
	Not using	10(20)	25(55.56)
Tillage equipment	Own tractor/mini tiller	6(12)	5(11.11)
	Leased in tractor	26(52)	15(33.33)

	Bullock	18(36)	25(55.56)
Threshing equipment	Stick	8(16)	15(33.33)
	Bullock	16(32)	25(55.56)
	Leased in thresher	26(52)	5(11.11)

Figure in parenthesis represents percentage

The majority (60%) of *Unnati* producers sourced fertilizers through cooperatives, whereas *Ghobi tori* producers were more diverse in sourcing, with 44.44% using cooperatives and 26.67% using agro-vets. Notably, 22.22% of *Ghobi tori* growers did not apply chemical fertilizers, in contrast to full fertilizer usage among Unnati growers.

A striking difference lies in seed sourcing: all Ghobi tori producers relied on own saved seeds, indicating its local and traditional adaptation, whereas 84% of Unnati farmers received seeds from the government bodies like Rapeseed Zone or AKC as subsidized inputs. This highlights *Unnati's* dependency on institutional support and *Ghobi tori's* self-sustaining seed system.

In terms of chemical pesticide usage, 50% of *Unnati* farmers sourced pesticides from agro-vets, while more than half (55.56%) of *Ghobi tori* growers refrained from using pesticides, possibly due to local pest resistance or limited pest pressure.

Mechanization was more common among *Unnati* growers, with over half (52%) leasing tractors and threshers. In contrast, 55.56% of *Ghobi tori* grower's dependent on bullocks for tillage and only 11.11% used mechanical thresher, indicating higher labor dependence and lower mechanization.

3.4 Status of Inputs Used in Rapeseeds Production

The seed rate in the study area was found to be 7.34 kg/ha for *Unnati* and 7.96 kg /ha for *Ghobi tori*, more than the recommended seed rate of 6 kg/ha due to broadcasting method of seed sowing. Moreover, rapeseed is utilized as vegetable in young stage which is also a reason for high seed rate.

The recommended dose of Urea, DAP and potash is 96:86:33 kg/ha (Krishi Diary 2079). Fertilizers were applied much less than recommended dose in the study area. Urea, DAP and potash were major chemical fertilizers used in the production of rapeseeds by the respondent farmers. Sulphur and other micronutrients were used very little or make no use of it. Table 8 shows the fertilizers used in the production of *Unnati* and *Ghobi tori* in the study area.

Table 7: Fertilizer use in production of rapeseed

Fertilizers	*Unnati*	*Ghobi tori*
FYM (tons/ha)	4.49	4.17
Urea (kg/ha)	45.58	40.11
DAP (kg/ha)	55.54	46.68

Potash (kg/ha)	11.26	7.62
Sulphur(kg/ha)	8.65	1.11

Source: Field survey

3.5 Area, Production and Productivity of Rapeseeds

The average area under rapeseed cultivation per household was found to be 0.386 ha for *Unnati* and 0.305 ha for *Ghobi tori.* The overall average production of *Unnati* was estimated to be 0.354 Mt (3.54 quintal) while the average production of *Ghobi tori* was estimated to be 0.201 Mt (2.01 quintal). Similarly, the productivity of *Unnati* was found to be 0.93 Mt/ha while the productivity of *Ghobi tori* was found to be 0.67 Mt/ha. The details are presented in Table 8.

Table 8: Area, Production and productivity per household

Variables	*Unnati* variety	*Ghobi tori*
Average area under rapeseed cultivation (ha)	0.386	0.305
Production (Mt)	O.354	0.201
Productivity (Mt/ha)	0.93	0.67

3.6 Costs and Returns in Rapeseeds Production

Cost of production refers to outlay of funds for the procurement of necessary inputs and labor employed. Inputs like seeds, manure, fertilizers, irrigation, tillage operations, harvesting, threshing, etc. are the factors incurring cost of production in rapeseed cultivation. Human labor is an important input that incur cost of production which was calculated in terms of man days, and then converted into monetary value considering the prevailing wage rates. Besides, land rent was taken into account as fixed cost incurred during rapeseed cultivation. Although farmers cultivated rapeseed on their own land, an imputed land rent was included in the cost calculation to account for the opportunity cost of land use. This ensures consistency in comparing profitability across different land tenure systems. The table 9 shows the detailed breakdown of the cost of production for *Unnati* and *Ghobi tori* varieties of rapeseed in the study area.

Table 9: Cost of production of rapeseed in the study area

	Unnati	*Ghobi tori*
Particulars	Amount (NRs/ha)	Amount (NRs/ha)
Variable Cost		
Seed	1345.25	1053.40
Manure	3560.75	2212.25

Urea	1640.06	1344.66
Dap	2650.33	2316.82
Potash	538.81	240.46
Micronutrients	160.99	109.00
Pesticides	311.35	191.12
Irrigation	1772.40	1772.40
Bullocks	1796.92	2142.83
Tractor	8825.67	8222.16
Thresher	3977.56	3679.50
Human labor	16247.00	16247.00
Total Variable Cost	42827.09	38478.21
Fixed Cost		
Land rent	14770.00	19693.73
Total Cost	57597.09	58171.94

Table 10 highlights the cost and return analysis from rapeseed cultivation in the study area. The result showed that the total cost of production per ha for *Unnati* was NRs. 57,597.09 and that for *Ghobi tori* was NRs 58,171.94 per ha. The gross return was NRs 105,586.34 per ha for *Unnati* and NRs 75,098.61 per ha for *Ghobi tori*. Similarly, the average net profit for *Unnati* and *Ghobi tori* were NRs 47,987.25 and 15,861.14 per ha respectively. The benefit cost ratio for *Unnati* was found 1.83 whereas that for *Ghobi tori* was found 1.29. This shows that the cultivation of both Unnati and *Ghobi tori* was profitable in the study area. The B:C ratio for *Unnati* (1.83) is higher as compared to *Ghobi tori* (1.29) because the average production and productivity per unit land is higher for *Unnati* variety.

Table 10: Cost and return analysis (in NRs/ha)

Parameter	Price (*Unnati*)	Price (*Ghobi tori*)
Total variable cost	42827.09	38478.21
Total fixed cost	14770	19693.73
Total cost	57597.09	58171.94
Gross return	105586.34	75098.61
Net profit	47989.25	16926.67
B:C ratio	1.83	1.29

3.7 Problems in Rapeseed Production

Rapeseed growers in the study area were facing certain problems related to production of rapeseed. Indexing/ scaling techniques was used for ranking those problems.

3.7.1 Problems in Production of Unnati

Untimely availability of inputs was ranked as the most severe problem (Table 11). Inputs such as quality seeds, fertilizers, pesticides, etc. were often not available at the appropriate time in the study area. The damage caused by insects and disease was ranked second in the study area. Limited irrigation, especially during the critical growth stage of crop due to limited irrigation facility in the study area was ranked third. Similarly, labor shortage was ranked fourth while inadequate government support—such as lack of access to extension services, subsidies, or timely technical assistance—was ranked fifth in the study area.

T**able 11**: Problems in the production of *Unnati* variety of rapeseeds

Problems	Index	Rank
Untimely availability of inputs	0.76	I
Insects/disease damage	0.68	II
Limited irrigation	0.63	III
Labor shortage	0.51	IV
Inadequate government support	0.39	V

3.7.2 Problems in Production of Ghobi tori

Limited irrigation during critical stages was identified as the major constraints for the production of *Ghobi tori* in the study area due to limited irrigation facility and was ranked first. The untimely availability of inputs such as fertilizers and pesticides were ranked second. Insect and disease damage was ranked third. Insufficient government support was ranked fourth while the shortage of labor, especially during sowing and harvesting time was ranked fifth among the problems in the study area.

Table 12: Problems in the production of *Ghobi tori* variety of rapeseeds

Problems	Index	Rank
Limited irrigation	0.78	I
Untimely availability of inputs	0.71	II
Insects/disease damage	0.62	III
Inadequate government support	0.49	IV
Labor shortage	0.41	V

4. Conclusions and Recommendations

The study revealed that the majority of the respondents were male, aged between 40 and 59 years, and predominantly belonged to the Chhetri ethnic groups with agriculture as their primary income source. Anong the two rapeseed varieties, *Unnati* was more popular than *Ghobi tori* as the area of cultivation, production and productivity per household was higher. The cost of cultivation was found to be higher for *Ghobi tori,* while the gross return was higher for *Unnati*. Both varieties proved to be profitable, as indicated by their benefit-cost ratios; however, *Unnati* showed a higher B:C ratio, reflecting better profitability. The key problems identified in rapeseed production were untimely availability of inputs (quality seeds and fertilizers) for *Unnati*, and limited irrigation availability for *Ghobi tori*. Additionally, fertilizers were applied much less than the recommended dose and the use for machineries in various operations like tillage, harvesting, and threshing was minimal.

Based on the findings, it is recommended that efforts to be made to improve the availability of quality seeds and fertilizers for *Unnati*, and enhance facilities for *Ghobi tori*. Further, the adoption of modern machinery for key agricultural operations like tillage, harvesting and threshing can improve productivity and reduce labor costs. It is also recommended to increase fertilizer application to recommended levels to maximize crop yield. To achieve these improvements, policy support in terms of input availability and infrastructure development would be crucial. With the right intervention, rapeseed production can be made a more profitable and sustainable enterprise in the study area.

Conflicts of interest: The authors have no conflicts of interest regarding this publication.

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