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## MARKETING AND VALUE CHAIN ANALYSIS OF JUMLI MARSHI RICE IN NEPAL

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### ABSTRACT

A study conducted on marketing and value chain analysis of Jumli Marshi. Chandananth municipality and Tatopani rural municipality in Jumla district were selected for study. Survey was carried out in September, 2019 to collect information from growers and traders as well. Semi-structured questionnaire were used to collect the primary data from 60 respondents by using purposive sampling technique. Out of 0.59 ha total average cultivated area, only 0.29 ha area were under Jumli Marshi cultivation with productivity of 2 mt/ha. About 85% of total population was found to be engaged in agriculture. Farm gate price was found to be Rs 50 per kg and in distant market was Rs 180 per kg and 65% of farmers use wholesaler marketing channels. The production cost per kg of Marshi rice was found to be Rs 18.5, having net gross margin of Rs 36587.33 per ha. The B/C ratio was found to be 2.69. The productivity and area under Marshi cultivation was in decreasing trend in recent years. The major production problem was found to be lack of proper technical knowledge and major marketing problem was found to be price instability. Marshi rice cultivation is highly profitable occupation in contest of Jumla district and can be commercialized in large scale but proper policies; marketing systems and technical knowledge awareness programs should be implemented to overcome major problems in Marshi rice cultivation and production.

### KEY WORDS

Aroma, Jumli marshi, marketing, Nepal, value chain, rice.

Agriculture is the main stay of Nepalese economy and crucial to livelihood of Nepalese people. Rice (*Oryza sativa L.*) is the most important cereal crop in Nepal. Rice occupies 58% of the total cultivated land and 55% of the total food grain production respectively (MoAC, 2005). The national total production of Rice is 5151925mt in total Rice cultivated area 1469545ha and with productivity of 3.50mt per ha of land respectively (Mandal, 2021). Rice grown from altitude of 70 masl up to 3059 masl (Bhujel, 2004). Jumla is the highest altitude located area in the world favorable for Rice cultivation up to 3050 masl (Bhujel, 2004 and Bista, 2004). In Jumla, Rice is used as *Bhat*, *chair* (rice pudding), *khatte* (popped rice), *laddu* (popped rice smeared with molasses and bulled), *maladroit*, *jand/raksi* which fetch economic and social importance (Poudel, 2011). Farmers are using traditionally preserved seed for production. They are sharing with each other or using their own saved seeds. The price of the rice mainly depends upon the price of paddy as determined by local large millers, traders and price in bordering of Indian markets (Sing, 1999). In case of Nepal the marketing of paddy passes through different big cities in which 98% passes from Biratnagar, 95% from Bhairahawa, and 90% in Nepalgunj through traders (Paudyal et.al 2010). In the case of mid western region average production is low due to lowest area under rice cultivation, poor yield and insufficient availability of irrigation facility (Joshi et.al 2011). The productivity of rice is comparatively more in the area near to urban than in rural area. It is due to market access, technical efficiency, input intensification, commercialization, market information is more in urban area than rural area (Piya et.al 2012)



In the case of Nepalese rice farm for the measurement of economic efficiency various factors such as timing of fertilizer application, irrigation, transplanting weeding quantities of land, human labor, mechanical labor, chemical use; institutional factors (extension system, researches and policies) play an active role (Dhungana et.al 2004). The major finding of economic inefficiency on Nepalese rice farm are lack of realization of an inefficiency problem at the farm level, lack of emulation of efficient farms, use of less input to achieve similar level of output and inappropriate resource allocation decision among farmers (Dhungana 2000). Jumli Marshi is an indigenous variety of rice which is grown on topmost elevation of the world, Chhumjul of Jumla district. Cultivation practice of Marshi rice in Jumla is probably since 1,300 year ago in the bank of the Tila River (Paudel, 2011). Among different variety of rice, Jumli Marshi is widely cultivated indigenous variety having unique character i.e. cold tolerant gene that support to thrive well in cold temperate condition (Ghimire, 2017). This variety is very susceptible to blast, as a result massive loss in yield which becomes the main cause of poor productivity (Paudel, 2011). NARC release two varieties chandannath-1 and chandannath-3 using Marshi (local landraces) to overcome this problem, in 2002. These two varieties are resistant to blast disease and high yielding as compared to Marshi rice ((Ghimire, 2017). Rice cultivated area of Jumla is 2745 ha, where as production and productivity is 5999mt and 2.18 mt respectively. This indicates that 1.5 times less than overall productivity of Nepal (MoALD, 2018). In Fiscal year 2016/17, an improved Rice seed annual sale in Jumla is 1731mt (Central Bureau of Statistics, 2018). This study primarily is concerned with study of market, value chain, socio- economic factors affecting rice production, marketing problems of Jumli Marshi rice in Jumla district as well as throughout the nation. Jumli Marshi rice has better taste, higher nutritional value, good fragrance and higher price compared to other rice varieties in the country. A large number of market actors were found to be involved in Jumli Marshi rice value chain. Demand of Jumli Marshi rice is increasing day by day.

## MATERIALS AND METHODS OF RESEARCH

The study conducted in Chandannath municipality and Tatopani rural municipality of Jumla district. This district was selected purposively because Jumli Marshi is emerging as the major hub of Jumli Marshi rice production in Nepal. Jumli Marshi produced here is quite famous throughout the higher class families of Nepal. The geographical position of Jumla district is 81° 51' to 82° 18' East longitudes and 28° 58' and 29° 30' North latitudes (DAO Jumla, 2019). Total rice cultivated area of Jumla is 2,745 ha with production 5,999 mt and total apple productive area is 935ha with production 6,545 mt (CBS, 2011). The crop is grown in height range from 915masl to as high as 3050masl (DAO Jumla, 2019).

A study preceding directing examination was done in the Jumla district. The information was used to design the research roadmap and questionnaire. Sample size of 60 HH having different socio-economic status were selected from Tatopani Rural municipality ward no- 3, 4, 5, 7 and Chandannath municipality ward no- 10 on simple random basis. In Jumla district there is one Municipality and seven rural Municipalities. Among the eight local levels, two are producing jumli marshi. These two Tatopani rural municipality and Chandannath Municipality were selected purposively. Stratified sampling was done to select 5 wards among total 10 wards. Among the selected 5 wards sample size proportional to size was selected using simple random sampling. All 60 samples were taken randomly from 5 wards which were selected randomly (ward no 3,4,5,7 of Tatopani rural municipality and ward no10 of Chandannath municipality). Traders were selected based on the information currently known, time and resources available, accessibility to and openness to marketing participants as well as the estimated size of the trading population. Random sampling was used for sampling unit as actors and 10 actors are selected randomly among 60 actors mainly among farmers, beparies, and millers. Primary data was collected from producers and traders through face-to-face interview. For the purpose of data preliminary study, data verification and validation, Focus Group Discussion (FGD) and Key Informants (KI) survey was conducted. Before household survey group of farmers especially 6 leader of Jumli Marshi producer along with 3



government official were brought together for discussion. FGD can be done by four cell analysis.

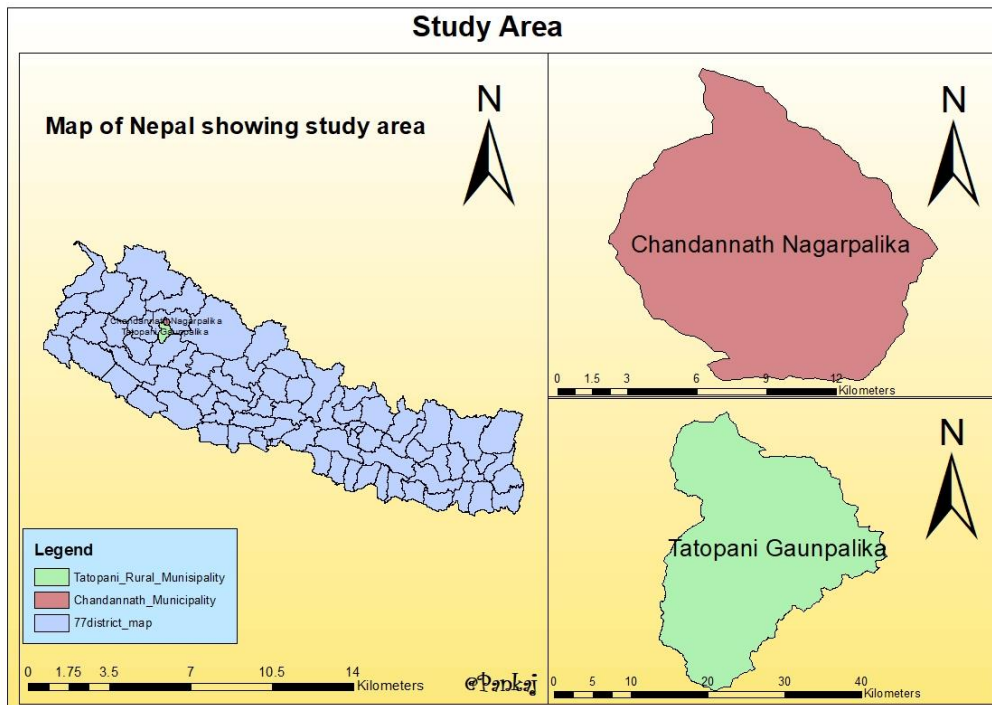


Figure 1 – Map of Jumla district showing study area

Table 1 – Focus group discussion (Four cell analysis)

Large area More production	Small area More production
Large area Less production	Small area Less production

After FGD, we were started household survey was conducted on the proposed area Chandannath Municipality and Tatopani Rural Municipality. Purposive sampling method was done sixty Jumli Marshi producer household by using a structured questionnaire. Questionnaire should be simple and don't related to personal. Hence both quantitative and qualitative data was obtained from household survey. At first, we setup questionnaire related to our objectives and made 60 questionnaires for 60 household. Our survey design was description and consistency in interview schedule was maintained with the objectives of the research. General information related to our research was topmost rank than after other information related to topics were included. Data were coded with the suitable codes and missing was checked. Frequency counts, cross tab, comparison of mean and variance was done to generate meaningful information. Descriptive statistical (mean, median, mode, percentage, range etc) were used to summarize the variables and to describe the study area. MS Excel 2007 was used to analysis the descriptive data. We used other statistical tools like R-stat, Gen-stat to study other variables as well.

## RESULTS AND DISCUSSION

Different socioeconomic characteristics such as family type, education level, ethnicity, occupation, gender, age group by descriptive statistical tools such as frequencies, percentages, means, mode and standard deviations wherever applicable.

The study reveals that most of the respondent in practices of rice cultivation were male (80%) and remaining 20% is female.

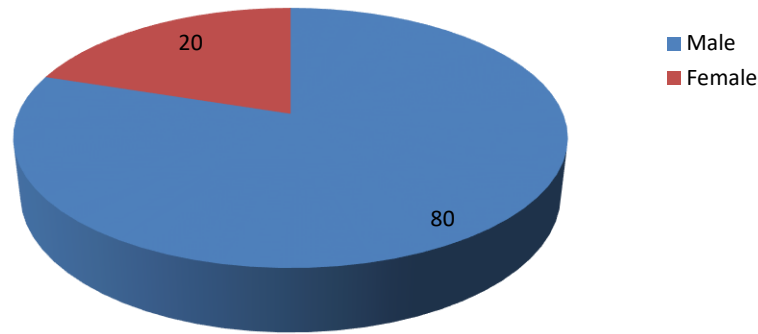


Figure 2 – Gender of respondent, %

The average age of household head in practices of rice cultivation is 46.35 year where as maximum and minimum age found to be 78 year and 26 year respectively. Statistical error is 1.74.

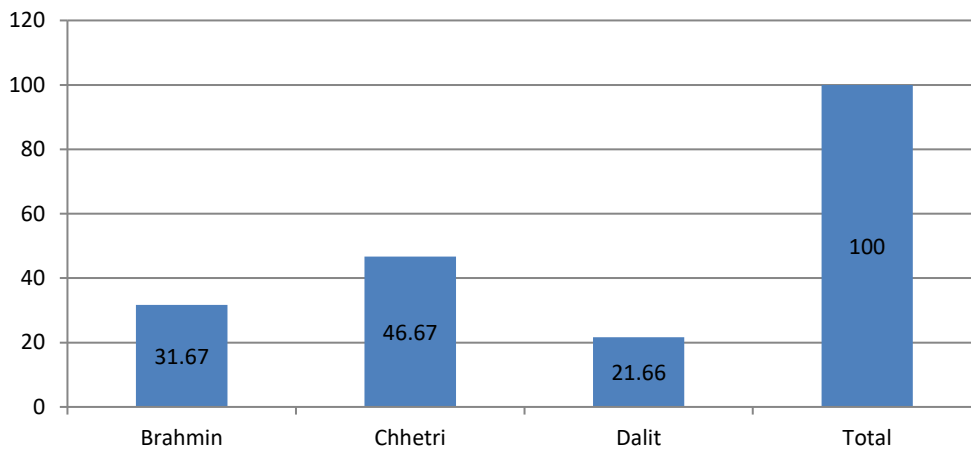


Figure 3 – Ethnicity of rice producing farmer, %

The figure shows that majority of respondent practicing rice cultivation were Chhetri (46.67%) followed by Brahmin (31.67%) and Dalit (21.66%). There is no any participation of Janajati for the practice of rice cultivation in research area.

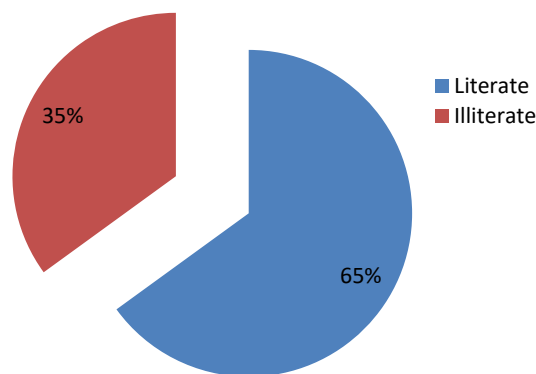


Figure 4 – Educational status of rice producing area

Education is the most important human capital which is the main factor of socio-economic and economic change in society. We made two categories as illiterate and literate.



Illiterate indicate people who studies less than primary level and literate indicate people who studies from primary level to university level. The study shows that 65% of surveyed population are literate and 35% illiterate while the national literate rate is 65.9%(CBS 2011). This proves that the surveyed population literacy rate is nearly equal with national literacy rate.

The majority of rice producing farmer’s family member belongs to age group. The average family size of study area is 6 and maximum family size is 17 while minimum family size is 3. The majority of rice producing farmers family member belongs to the age group between 16-60 with population 384 (63.89%) which is followed by the population 180 (29.95%) and member above 60 with population 37 (6.1%). The population of 16-60 is also known as economically active population. This shows that survey area have more percentage of EAP.

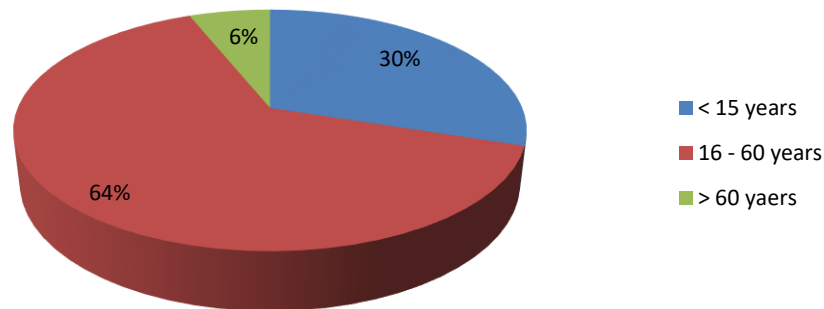


Figure 5 – Involvement of age groups in rice production of households

The major source of income rice producer was found to be Agriculture (85%) followed by service (8.3%) and Business (6.66%). This shows high contribution of agriculture in livelihood of rural community in Jumla district.

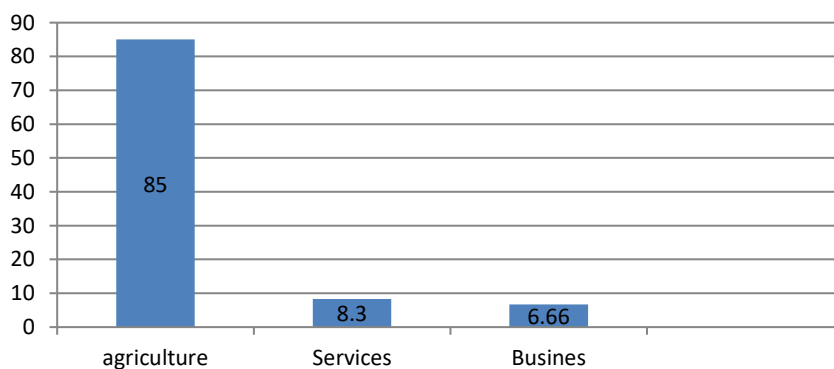


Figure 6 – Occupation of Surveyed area under sample survey 2020, %

Table 2 – Income under sample survey 2020

Income	Average	Maximum	Minimum	Statistical error
Agriculture	94642	855000	13210	15686.15
Jumli Marsi	5973767	840000	1860	14963

Above table shows that income from jumli marshi 59737.67(63.11%) o total annual income from agriculture 94642 of people. This indicates there is great contribution of marshi rice production and marketing in rural household economy. On the other hand the maximum income from agriculture is 850000 and while from marshi is 840000 and minimum income from agriculture and Jumli marshi is 13220 and 1860 respectively. But there is high value of statistical error of agriculture (15686.15) and Jumli marshi (14963) which indicates that there is great variance of income of farmer.



Table 3 – Cultivation area of Jumli marshi

<i>Land holding</i>	<i>Average</i>	<i>Maximum</i>	<i>Minimum</i>	<i>Statistical error</i>
Total cultivated land (Ropani)	11.63	49.13	0.32	0.9
Total Jumli Marshi cultivated land (Ropani)	5.88	78.64	0.17	1.39
Total Fallow land (Ropani)	3.21	39.23	0	0.77

Above table shows that total land is 14.84 ropani. Among them 11.63 ropani is cultivated and remaining 3.21 ropani is fallow land. Total land under marshi cultivation is 50.55% (5.88 ropani) of total cultivated land 11.63 ropani. The maximum land that a household use for marshi rice cultivation is 78.64 ropani and minimum land that a household use for cultivation is 0.17.

Table 4 – Total cultivated land

<i>Land holding</i>	<i>Average</i>	<i>Maximum</i>	<i>Minimum</i>	<i>Statistical error</i>
Total owned (Ropani)	10.49	117.96	0.98	2.12
Leased-in (Ropani)	0.47	9.83	0	0.21
Leased-out	0.67	19.6	0	0.37
Total	11.63	49.13	0.32	0.9

Above table shows that cultivated land is 11.66 ropani among them 10.49 ropani is owned land, 0.47 ropani is leased-in land and 0.67 ropani is leased out land. Maximum and minimum cultivated land is found to be 49.13 ropani and 0.32 ropani respectively.

Table 5 – Membership status analysis of Farmers under sample survey 2020

<i>Involvement</i>	<i>Percentage</i>
Involvement in Cooperative	23.3
Involvement in group	60.0
Involvement in either group or cooperative	61.7
Involvement in both	21.7

Farmers involvement in cooperative were 23.3%, involvement in group were 60%, involvement in either group or cooperative were 61.7%, involvement in both group and cooperative were 21.7% respectively.

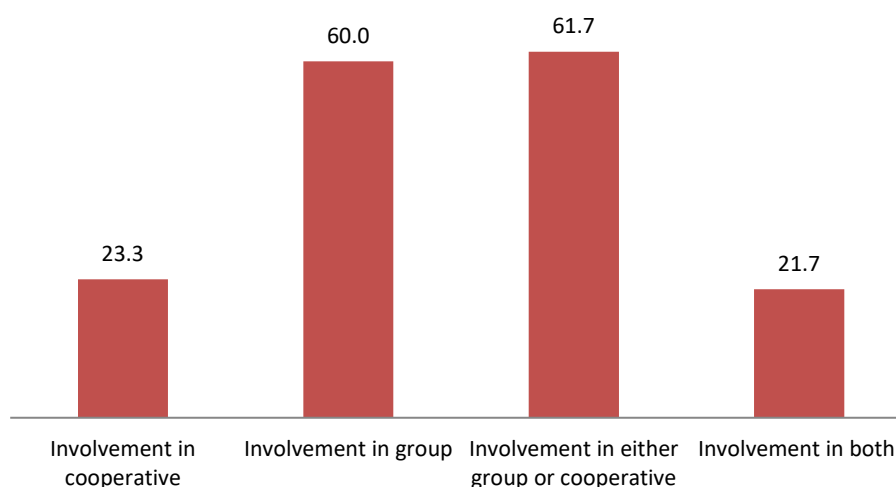


Figure 7 – Membership Status of Farmer under sample survey 2020



Table 6 – Area and production of Jumli Marshi under sample survey 2020

Year	2016	2017	2018	2019
Area	6.5	6.8	6.5	5.7
Production	11.7	11.0	10.8	11.3
Productivity	1.8	1.6	1.7	2.0

In 2016, area for Marshi cultivation was 6.5 ha having production 11.7 mt with productivity 1.8mt/ha. In 2017, area for Marshi cultivation was 6.8 ha having production 11.0 mt with productivity 1.6mt/ha. In 2018, area for Marshi cultivation was 6.5 ha having production 11.8 mt with productivity 1.7mt/ha. In 2019, area for Marshi cultivation was 5.7 ha having production 11.3 mt with productivity 2.0mt/ha.

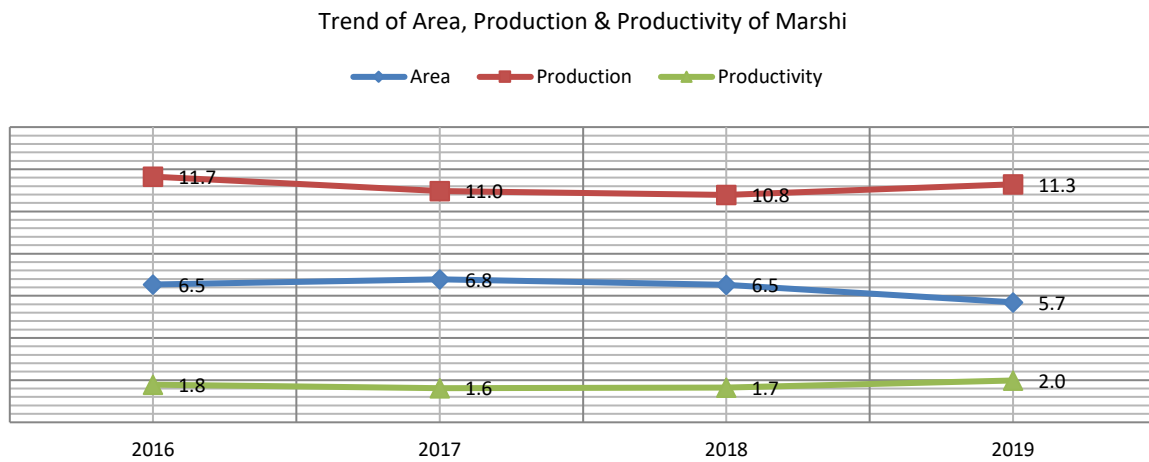


Figure 8 – Trend of Area, Production and Productivity of Marshi under sample survey, 2020

The graph above shows the trend of area, production and productivity of Marshi recent years. In the case of area of cultivation, it shows area for Marshi cultivation is in decreasing order in recent years 2016,2017,2018,2019 with production area 6.5, 6.8, 6.5, 5.7 ha respectively due to use of land for non-agriculture sectors, uplands were replaced by apple cultivation. In the case of production, it shows production is in decreasing order in recent years 2016, 2017, 2018, 2019 with production 11.7, 11.0, 10.8, 11.3 mt respectively due to decrease in Marshi cultivation area, and poor system of cropping. In the case of productivity, it shows productivity I in increasing order despite of decrease in area of cultivation in recent years 2016, 2017, 2018, 2019 with productivity 1.8, 1.6, 1.7, 2.0 mt/ha respectively due to advance in cultural practices, provision of improved varieties, use of manures and fertilizers at recommended, irrigation facilities.

Table 7 – Area comparison under Jumli marshi and Apple cultivation

Year	2016	2017	2018	2019
Area under Jumli Marshi Cultivation	6.53	6.78	6.52	5.69
Area under Apple Cultivation	1.05	0.80	0.93	1.07

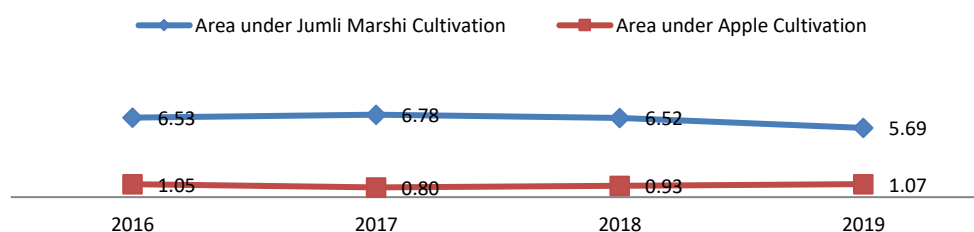


Figure 9 – Area comparison of Jumli Marshi and Apple cultivation under sample survey, 2020



Table 8 – Production Problems

Production Problems	Index value	Ranking
Technical know-how	3.97	I
Irrigation problem	1.48	V
Credit problem	1.40	VI
Disease and pests	2.78	IV
Quality seeds	3.77	III
Fertilizer problem	3.90	II

The major problem was Technical know-how ranking first having index value 3.97 due to lack of technical education or training programs provision to farmers, poor coordination between researchers, extension workers and farmers at local level, majority of farmers follows traditional farming systems. Fertilizer problem ranking second having index value 3.90 due to insufficiency in provision of synthetic chemical fertilizers to farmers, poor buying capacity of farmers. Quality seed problem was ranking third having index value 3.77 due to poor provision of quality seeds to farmers, poor farmers are unknown about the improved varieties quality seeds, no sufficient programs for subsidies in quality seeds. Disease and pests problem was ranking fourth having index value 2.78 due to majority of farmers crop indigenous varieties which are less susceptible to disease and pests, no use of chemical methods for disease and pests control. Irrigation problem was ranking fifth having index value 1.48 due to poor irrigation systems or methods used, most of upland are out of reach of irrigation facilities. Credit problem was ranking sixth or last having index value 1.40 due to no commercialization in this sector, no special credit provision programs are made for poor farmers.

Table 8 – Marketing problem

Marketing Problems	Index values	Ranking
Problem of middle man	3.28	III
Fine processing	2.65	VI
Price stability	3.60	I
Low price	3.53	II
Transportation	1.72	VIII
Low demand	2.93	IV
Competition	2.92	V
Distant market	1.83	VII

The major marketing problem was Price stability ranking first having index value 3.60 due to no fixed price tag by government, no quality standards checks and certification agency involved. Low price problem ranking second having index value 3.53 due to improper supply chain and value addition chain, no competitive buyers in local areas. Problem of middle man ranking third having index value 2.28. Low demand ranking fourth having index value 2.93. Competition ranking fifth having index value 2.92. Fine processing problem ranking sixth having index value 2.65. Distant market problem ranking seventh having index value 1.83. Transportation problem ranking eighth having index value 1.72 due to most of farms are in range of at least roadways.

Table 9 – Satisfaction level

	Last year price	Last year production
Not satisfied at all	50	49
Low Level of satisfaction	6	7
It's Ok	3	4
Satisfied	1	0

Above pie charts shows satisfaction level of farmers at last year price and last year's production of marshi. In the case of last year price, 83% of farmers were not satisfied at all, 10% of farmers falls low level of satisfaction, 5% of farmers falls it's ok level of satisfaction and 2% of farmers were satisfied. In the case of last year production, 82% of farmers were





not satisfied at all, 11% of farmers feels low level of satisfaction, 7% of farmers feels it's ok level of satisfaction and 0% of farmers were satisfied.

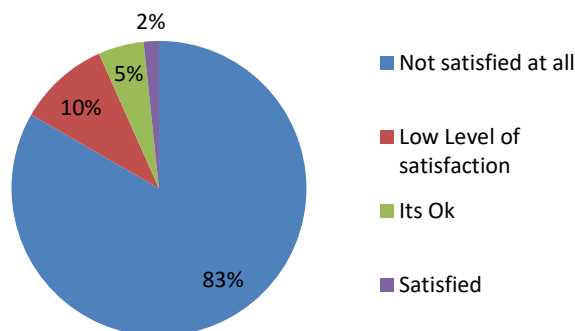


Figure 10 – Satisfaction level last year price

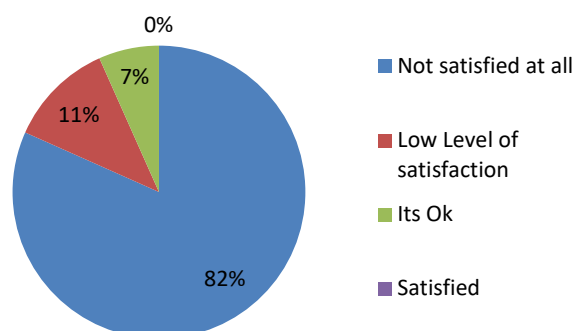


Figure 11 – last year Production

Gross margin is quick and simple method for determination of profit and loss in the farm business:

- Total Income = Rs. 134647.5/ha;
- Total cost of production = Rs. 50054.83/ha;
- Net gross margin = Rs. 36587.33/ha.

The result shows that the gross margin in study area was Rs. 36587.33 This indicates that marshi cultivation is profitable enterprise in Jumla district. In our study B/C ratio was found 2.69. It indicates that the marshi rice cultivation in Jumla is expected to deliver a positive net present value to a farmer.

Table 10 – Price of Marshi rice

Particulars	Price(Rs)
Farm gate price	50
Price of paddy in local market	70
Price of dehulled rice in local market per kg	130
Price of dehulled rice in distance market per kg	180

Table 11 – Cost cultivation

Characteristics	Price (Rs)
Variable cost	42031.83
Fixed cost	8023
Total cost of production/ha	50054.83
Cost of production/ropani	3336.99
Cost of production/Kg	18.58



Average variable cost was Rs. 42031.83, average fixed cost Rs. 8023 and average production cost for 1 kg of rice was Rs. 18.58. Thus the survey result shows that average production of marshi rice was found 179.53 Kg/ropani and 2692.95Kg/ha.

Table 12 – Major marketing channel of Jumli marshi

Respondents	Marketing channels
65%	Farmer → Kosheli Ghar / Wholesaler / Collector → Consumer
23%	Farmer → Milling / Processor → Kosheli Ghar / Wholesalers / Collector → Retailer → Consumer
12%	Farmer → Kosheli Ghar / Wholesaler / Collector → Super Market Consumer

In our study area, we found that marketing channel is farmer to kosheli ghar or wholesalers or collector to consumer, i.e. 65%.

## CONCLUSION

Although Nepalese farming system is dominated by the cereal cropping system and Rice has been one of the most dominated cereal crop of Nepal ranking 1<sup>st</sup> in production and prepare area as well. Among Rice varieties, Jumli Marshi Rice is most preferred staple food crop in Jumla district and is also major source of income enhancing the livelihood of poor farmers. The total area for Marshi rice cultivation is decreasing in recent years despite of increase in its productivity and demand in global market fetching good price as well. In study it was found that 85% of people are engaged in agriculture, 8.3% in services and 6.6% in business respectively. The total average land holding is 11.63 ropani (0.59 ha), total Jumli Marshi cultivated land average is 5.88 rop (0.29ha) and average productivity is 2 mt/ha. The average annual agriculture income is Rs 94642 and out of them, from Jumli Marshi rice only average annual income is Rs 59737. Total cost of production is Rs 50054.83 per ha and total income is Rs 134647.7 per ha with net gross margin of Rs 36587.33 per ha. The B/C ratio is 2.69 which indicate Jumli Marshi cropping system is a profitable enterprise. But they only covered their cost of production and not get satisfied. The cost of production per kg of rice is Rs 18.58 and farm gate price is Rs 50 per kg but in distant market price is Rs 180 per kg and 65% of marketing channel is under Farmer → Kosheli ghar / Wholesaler / Collector → Consumer. Farmers were the first value adding actors who produced and supplied but they did not receive fair price. The major production problems are lack of technical knowledge, insufficient fertilizers, no availability of quality seeds and major marketing problems are price stability, low price, and middleman problem respectively. From this study, it was concluded that Jumli Marshi rice cropping system enterprises have good potential in its commercialization having very good B/C ratio value. For achieving higher return through higher efficiency from Jumli Marshi production, farmers should adopt proper technical knowledge and government should implement policies for provision of sufficient fertilizers, quality seeds, price stability and enhance direct marketing channels from producers to consumers and strengthen the existing cooperatives and groups and poor farmers should be in rich of subsidies in various agricultural inputs and implements as well.

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