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RESEARCH ARTICLE

HOUSEHOLD DEMAND OF FRUITS AND VEGETABLES IN KANCHANPUR DISTRICT, NEPAL

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ABSTRACT

Survey research was conducted to study the household (HH) demand of fruits and vegetables in Laljhadi and Bhimdatta Kanchanpur. Primary data was collected from pre-tested interview schedule, direct observation and focus group discussion. Collected data were analyzed using descriptive statistics to identify factors determining the household expenditure on fruits and vegetables. 60.03% population were economically active with male headed majority and 48.33% of the household were found having agriculture as major occupation. The results of multiple linear regression revealed that factors like year of schooling, average annual income, household which offers fruits to guest have positive significant effect on total expenditure on fruits and vegetable while factor total land owned have negative significant effect at 5%. The area under vegetable cultivation was found higher in case of Laljhadi and reverse was the situation for fruit cultivation. Low family income was the major factor shrinking the demand of fruits and vegetables. Household consumption of fruit and vegetable is highest during the festive seasons.

KEYWORDS

Household, fruits, vegetable

1. INTRODUCTION

Agriculture contributes only 27% to GDP where 65% of population were engaged in it (MOAD 2019). Nepalese agriculture is characterized by subsistence farming, monsoon-based agriculture, traditional farming method, fragmentation of land, dual ownership of land and dominated by food crops and crop is mostly integrated with livestock (FAO, 2010; Bhandari, 2007). Rice, wheat, maize, millet, barley and buckwheat are major stable food crops where lentil, gram, black gram and soybean are important pulse crop and oilseed, potato, tobacco, sugarcane, jute and cotton are important cash crops. Nepal also grows a number of important fruits and vegetables crop like apple, pear, plum, walnut, orange, lime, mango, banana, cucumber, lady fingers, brinjal, pumpkin and several leafy vegetables (FAO, 2010). Vegetables and fruit cultivation is emerging an important income generating sources among various types of enterprises Vegetables and fruit production provides a way output of poverty for smallholder farmer and landless are vital for combating the "hidden hunger" of micronutrient malnutrition (AVRDC,2000; Bhandari, 2007).

This research help to know the demand and trade of fruits and vegetables in Kanchanur district with their influencing factors. Agriculture perspective plan (APP) has regarded the vegetables and fruits (citrus) high value crop and business of vegetables and fruit growing is becoming a stable source of income for farmers. The growing importance of vegetables and fruit in Nepalese economy can be well appreciated in terms of raising domestic demand on account of increasing population per capita and increasing global demand (Thapa and k, 1998). In Nepal Fruits are cultivated in 162660 hectares having production of 1018808 mt and yield 9.22 mt/hac whereas in province no.7 fruits are cultivated in 4365 hectares having production of 684942 mt and yield 10 mt/hac. In kanchanpur district fruits are cultivated in 578 hectares having production of 7432 mt and yield 14 mt/hac.

The most prevalent fruits grown in kanchanpur district (in terms of total hectare of area): banana (735 ha), guava (306 ha), Mango (200 ha), papaya (70 ha), litchi (50 ha) and jackfruit (20 ha) (statistical information on Nepalese agriculture 2016/17). In Nepal vegetables are cultivated in 277399 hectares having production of 3749802 mt and yield 13518 kg/ hac. In kanchanpur district mostly cultivated vegetable is tomato (in terms of total area of hectare): tomato (512 ha), cucumber (480 ha), bottle gourd (455), cabbage (410 ha) pumpkin (300), raddish (250), bitter gourd (230) and mustard (50 ha). (Stastistical information on Nepalese agriculture 2016/17). The least cultivated is yam and chayote with lesser production and productivity. The vegetables and fruit sector in Nepal has grown rapidly between 2000 and 2020, overall vegetables production has increased by an average of 6.9% per annum (Bhandari, 2007).

According to the 2009/10, Nepal vegetable survey, vegetable farming is considered as a common and important source of subsistence for over 3.2million families (69% of all household) in Nepal and 17% of which are female headed which serve as source of subsistence. For 12% of grower's vegetable farming (income and consumption) sustain them all year round with further 37% being sustained for 4-6 months (CBS,2010). Vegetables and fruit production is becoming a stable source of income for farmers. However, per capita consumption of vegetables and fruit in Nepal is significantly lesser than requirement i.e 300 gm/ person/day vegetables and 400 gm/person/day fruits (WHO, 2000; AVRDC,2000). only 45% of local demand of fruits is met by domestic production and only 30% of local

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demand of vegetables is met by domestic production (MOAD, 2013; MOAC,2010).

Per capita vegetables consumption has increased to 105 kg from 60 kg over the last two decades due to massive rise in agriculture and production area (MOAC, 2010). per capita consumption of fruits is low in Nepal compared to Europe and US. In 2013, per capita consumption of fruits in Nepal was only 61 kg while it was 95 kg in Europe and 105 kg in US (Pandey et al., 2017). Nepal is mostly an importer of fruits and vegetables. Experts have recommended a daily intake of least of 400 gm of fruits and vegetables daily (WHO, 2005). Measuring intake of fruits and vegetables recommended for male is138.7gm (fruits) and 70.5 gm vegetables whereas for females 123.1gm (fruits) and 66.3 gm (vegetables) respectively (WHO, 2005). Household consumption of vegetables in mountain is (84.5%),hills (39.2%) and in terai (35.0%).In province no.7 household consumption of vegetables is 70.5% (MOAD, 2013).

2. Objectives

2.1 Broad objective

- To know household demand of fruits and vegetables in Kanchanpur, district.

2.2 Specific objectives

- To find out the major factors which determine the demand of fruits and vegetables
- To know about the production and consumption pattern of fruits and vegetables in Kanchanpur, district.
- To know about the factors influencing the trade of fruits and vegetables.

3. Results and Discussion

3.1 Study area

Research was carried on one municipality (Bhimdatta) and one rural municipality (Laljhadi) of Kanchanpur district of Far-Western Provience of Nepal (Figure 1) covering 1610 sq. Km with an elevation ranging from 176 masl to 1528 masl. All the Farmers and sellers from this settlement were the target population for this study. Sampling Framework was prepared based on the information obtained key informants, local leaders, secondary source and other stakeholders. Based on the criteria of farming and selling experience sample size of 60 household and 30 seller were selected randomly from the study area.

3.2 Methods of data collection

In the study both the primary and secondary data were collected and analyzed. The local communities and farmers having long experience in autonomous adaptation of the study area and pretested interview schedule was piloted to the respondent to collect primary information from date please. These data were supplemented by the information obtained from focal group discussion, direct observation, transect walk. Participatory method were use to collect data, to share experience and knowledge of household demand for fresh fruits and vegetables. Secondary data were collected from various published journal, research articles, proceeding of various NGOS and INGOS report of District Agriculture Development Office (DADO), District development committee

(DDC), National Agriculture Research Council (NARC),Central Bureau of Statistics (CBS), local leaders and working agencies were the source of secondary data.

3.3 Methods and techniques of data analysis

Information collected from the field survey was coded first and entered into the Microsoft Excel. Data entry and analysis were done by using computer software package, Statistical Package for Social Science (SPSS 20.0 version) and Microsoft Excel 2010. The local units of measurements were corrected into scientific one. Both descriptive and analytical methods were used to analyze the data (Stockhomer, 2019). Appropriate five point likert scaling method was used to qualitative information from the survey questionnaire (Mishra et al., 2020). Yes or no, increase or decrease were noticed and changed to dummy for the further analysis.

Figure 1: Map of study area

3.4 Qualitative analysis

Qualitative data were analyzed by using both descriptive and analytical statistics. Socio-economic and farm characteristics of the respondents like family size, age, occupational pattern, change in size of land holding, size of the vegetable cultivation, distribution of economically active population consumption pattern of fruits and vegetables were descriptive statics like frequency, percentage, mean and standard deviation. Changes in the trend of area of fruit and vegetable cultivation and pattern of their demand obtained from primary and secondary sources were analyzed by estimating the trend line by using Microsoft Excel.

4. Result and Discussion

4.1 Socio-demographic and farm characteristics

4.2 Socio-demographic factors

Average age of household head was found to be 39.03 in Laljhadi and 44.2 years in Bhimdatt Municipality. Majority of households (61.67%) were male headed in our study area which was also reported by Malla et al. (2021) in his study. The scenario is more dominant in case of Laljhadi (66.67%) than Bhimdatt (56.67%). Majority of population were Brahmin (38.33%) followed by Chettri (28.33%) then Janjati (23.33%) and Dalit (10%). The years of schooling of farmers in Bhimdatt (9.76 years) was found to be higher as compared to the Laljhadi (8.23 years). Majority of members in family (60.03%) was of economically active age with approximate 6 members.

4.3 Economic and business-related factors

On an average 48.33% were engaged in agriculture followed by business, service, remittance, and pension. The total cultivated land in Laljhadi Rural Municipality was found by 0.52 hectare out of which 0.48 hectare was owned by the respondents whereas the average total cultivated land in Bhimdatt Municipality was 0.61 hectare out of which 0.58 hectare was owned by the farmers. The total income from agriculture was found Rs 139233 out of which 36.36% was contributed by vegetable production in Laljhadi Rural Municipality whereas 146333 was total annual income from agriculture in Bhimdatt Municipality in which 16.48% was contributed by vegetable production. People are engaging in agriculture sector nowadays as a profession for better economic development (Nagya, 1995).

4.4 Production Scenerio

The vegetable producing area (Figure 2) in Bhimdatt municipality was seen in decreasing from 2016 to 2017 with 0.3 kattha and was found 2.30 in 2018 with constant as compare with 2017 and decreased by 0.45 kattha in 2019. The number of trees cultivated was in increasing trend from 3.90 fruit trees per farmer house in 2016 to 4.53 trees in 2017. The number of trees reached 6.23 in 2018 by increasing 1.7 and reached 7.33 in 2019

(Figure 3). The increasing in fruits trees is due to increasing in awareness among people about the fruit's consumption, increasing in modern and scientific nursery in urban areas, presence of lesser land due to plotting problem which is useful for only few trees rather than other farming. This decreasing trend of area under vegetable production in Bhimdatt was probably due to declining land holding by farmer due to plotting of land.

Table 1: Socio-economic characteristics of the individuals

Socio-economic characteristics	Laljhadi Rural Municipality		Bhimdatta Municipality	
	Values	SE	Values	SE
Gender of HH Head	-	-		
Male	20(66.67%)		17(56.67%)	
Female	10(33.33%)		13(43.33%)	
Age of house hold head	**39.03**	**2.06**	**44.2**	**1.94**
Ethnicity		-		
Brahmin	6(20%)	-	**17(56.67%)**	
Chhetri	10(33.33%)	-	**7(23.33%)**	
Janjati	11(36.67%)	-	**3(10%)**	
Dalit	3(10%)	-	**3(10%)**	
Years of schooling	**8.23**	**0.88**	**9.76**	**0.82**
Family size		-		
Members below 15 years	1.9	0.19	1.56	0.156
Members between 16-60	3.33	0.29	3.6	0.35
Members above 60	0.73	0.15	0.43	0.13
Avg. family size	**5.93**	**0.51**	**5.73**	**0.54**
Major occupation	-	-		
Agriculture	19(63.33%)	-	10(33.33%)	
Service	1(3.33%)	-	9(30%)	
Remittance	5(16.67%)	-	2(6.67%)	
Business	4(13.33%)	-	8(26.67%)	
Pension	1(3.33%)	-	1(3.33%)	
Land holding	-	-		
Total owned (ha)	**0.48**	**0.05**	**0.58**	**0.09**
Total Cultivated land (ha)	**0.52**	**0.05**	**0.61**	**0.08**
Annual Income from Agriculture	**139233.33**	**18886.57**	**146333.33**	**19318.76**
Annual Income from Vegetable	**50633.33**	**12714.68**	**24116.667**	**4803.95**

Source (Field study, 2020)

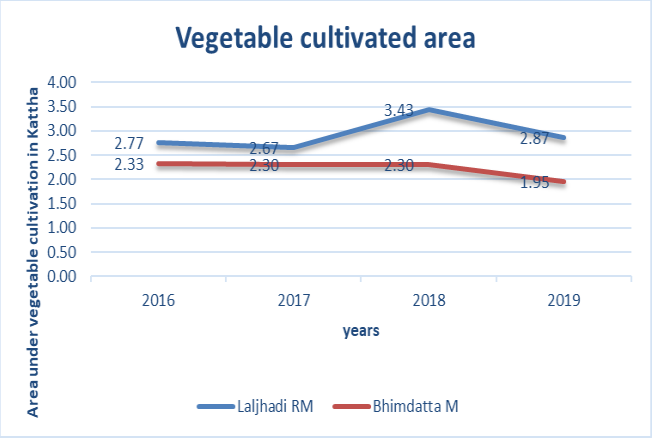

Figure 2: Area under vegetable cultivation

The area under vegetable production in Laljhadi appears to be increasing in trend between 2016 and 2019. It reached a peak of 4.93 kattha per household during 2019. Average land holding was found 14.4 kattha and total cultivated land was 15.6 kattha in this rural municipality. For the number of fruit trees area under cultivation was increasing during 2017/18 but then declined from 3.3 during 2018/19. As this fluctuation in area under vegetable production was seen due to the lack of knowledge about marketing of the vegetable, subsistence farming system, due to influence of climatic factor in production as one year more production they reduce their vegetable cultivation area (Cook, 1990).

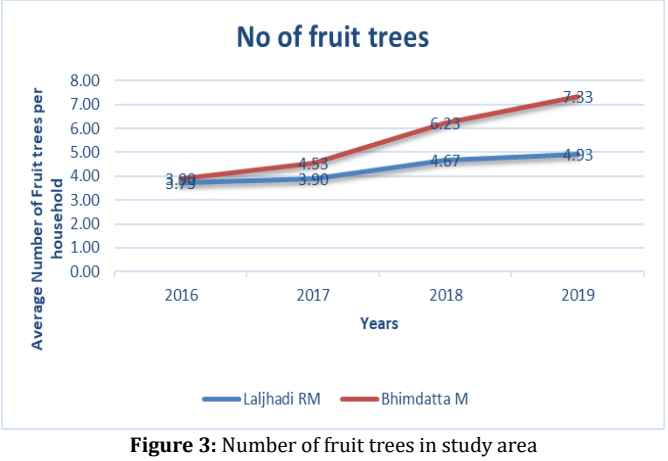

Figure 3: Number of fruit trees in study area

4.5 Comparison of trend on fruits and vegetable production in Laljhadi RM and Bhimdatta M

The area under fruit production is comparatively higher in case of Bhimdatta than Laljhadi for every year of study. In both the local level the area under fruit cultivation is in increasing trend. This may be because of the reason that people more conscious about the consumption of fruits and government is also promoting fruit trees cultivation. The area under vegetable cultivation is higher in case of Laljhadi as compared to Bhimdaatta. In Laljhadi population density is comparatively less and most of the people are engaged in commercial vegetable farming.

4.6 Expenditure Scenario

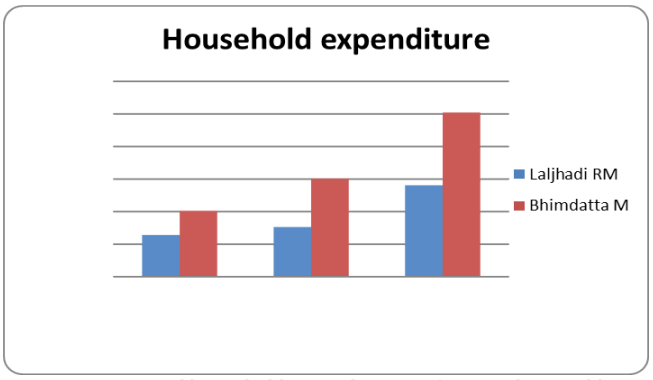

Figure 6: Annual household expenditure on fruits and vegetables

Figure 6 revealed that the average annual household expenditure on vegetables is comparatively higher than that of fruits in both the local levels. This is because of the reason that vegetable is taken as essential commodity in every meal. Annual expenditure on fruits and vegetables is comparatively higher for the households living at Bhimdatta. This may be because of the reason that people living at Bhimdatta have higher buying capacity and higher willingness to pay as compared to the people living at Laljhadi RM. Now days people living in urban and peri-urban areas are becoming more health conscious and consuming more fruits and vegetables.The expenditure in both fruits and vegetable are seen highest in Ashoj and Kartik but less in Chaitra and Baishak. This may be because of the reason that major festivals of Nepalese fall in these months and our consumption behaviour reflects that consumption pattern is changed during festivals as compared to other seasons. The expenditure in vegetable is less in Chaitra, Baishak as they produce the crop in their farm during these months and these results are in accordance with findings (Nagya, 1995).

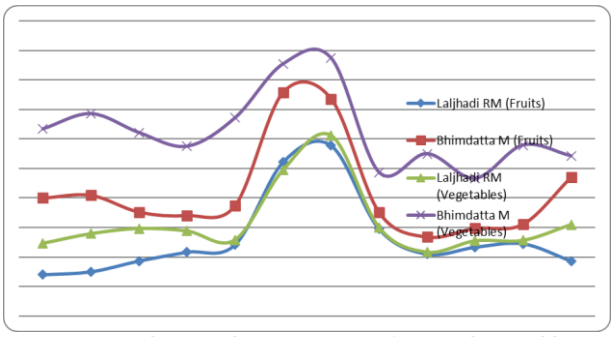

Figure 7: Family expenditure pattern on fruits and vegetables in different months

4.7 Factor affecting demand of Fruits and Vegetables

Crop wise ranking of consumer perception demand determining factors showed that most of the respondent consider health factor as the major factor affecting demand of fruits and vegetable. Price factors rank in 2nd position for both whereas taste and preferences factor rank in 3rd position for fruits and 4th for vegetable, quality factor ranks 3rd position among factors affecting demand for vegetable and 4th for fruits and support to farmers ranks for the 5th position.

Table 2: Factor affecting demand of Fruits and Vegetables

Determining factors	Index value	Rankings
Health factor	4.55	**I**
Price factor	3.78	**II**
Quality factor	3.10	**III**
Taste and preferences	2.63	**IV**
Support to farmers	1.65	**V**

4.8 Major factors shrinking the demand of fruits and vegetables

The major factor shrinking the demand of fruits and vegetables were ranked by using factor ranking tool. There are altogether six factors which are ranked according to their index value. Among all low family income was the major factor. Expensiveness ranked as second factor followed by lack of knowledge about importance, not attractiveness of items, market information gap and limited choices are ranked orderly as the shrinking factors of fruits and vegetables (Malla et at., 2021).

Table 3: Major factors shrinking the demand of fruits and vegetables

Factors	Index value	Rankings
Low family income	4.97	**I**
Not attractive	2.80	**IV**
Lack of knowledge about importance	3.02	**III**
Market information gap	2.10	**V**
Expensive	3.75	**II**
Limited choices	1.97	**VI**

4.9 Factors influencing trade

According to the surveyed farmers in Kanchanpur, numerous factors are affecting vegetable and fruits trade. Almost all surveyed farmers think that recurrent price fluctuations are the main factor affecting trade which is supported by (Rai et al., 2019). Similarly, price on another commodity also account as major factor influencing trade. The income of the farmers, consumer demand and government trade policy were ranked as 3rd ,4th and 5th position by using factor ranking table that were influencing the trade in study area.

Table 5: Factors influencing trade

Factors affecting trade	Index value	Rankings
Price	4.97	I
Income	4.30	III
Consumer demand	3.33	IV
Government trade policy	2.30	V
Price on another commodity	4.40	II

4.10 Factors determining the total expenditure of household on fruits and vegetables

Table 6 provides the results of multiple linear regression model to determine the most critical factors that affects the total household expenditure on fruits and vegetables. The model's R2 = 0.447 revealed that about 44.7 percentage of the decision to expend money of fruits and vegetable is governed by the tabulated 11 variables jointly i.e model fits 44.7 percent to the given data.

4.10.1 Social factors

The result revealed that the social factors like age of household head and gender of household head didn't show significant effect of total amount of expenditure on fruits and vegetables with negative sign. But the variable years of schooling have positive significant effect on annual total expenditure on fruits and vegetables at 1% level. It reflects that if the year of schooling increases by 1 year than the probability to spend on fruit and vegetable increases by Rs 1111.08.

Table 6: Factors determining the total expenditure of household on fruits and vegetables

Determinants	Coefficients	Std.Error	T
Age of HH head	-119.58	129.43	-0.93
Gender of HH head	-3250.72	3002.76	-1.08
Years of schooling	1111.08***	350.38	3.17
Distance from local market	434.70	748.08	0.59
HH major occupation	-1708.32	1593.0	-1.07
Total land owned	-11362.09**	5125.22	-2.21
Average annual income	0.62***	0.19	3.26
Involvement in cooperatives	-3866.08	2964.87	-1.30
Involvement in group	9.031	2945.9	0.003
Attended training on nutrition	-6569.77	4393	-1.49
Offers fruits to guest	7627.12***	2805.17	2.72
Constant	**13061.0**	**7929.89**	**1.65**

Dependent variable: Average annual expenditure on fruits and vegetables.

R square value 0.447

***sig@1%;**sig@5%;sig@10%

4.10.2 Economic factors

The results revealed that total land owned have negative significant effect on annual expenditure on fruits and vegetables at 5% level. When the land holding increases by 1 Ropani the probability to spend on fruits and vegetables decrease by Rs 11363.09 per household. This may be due to the reason that households having more land cultivate vegetables and fruits on their land. They have to buy fewer amounts of fruits and vegetables. Similarly average annual income has positive significant effect on annual expenditure on fruits and vegetables at 1% level. Household having more annual income are more likely to spend more on fruits and vegetables. Variables like household major occupation, involvement in groups and cooperatives have no significant effect on annual expenditure on fruits and vegetables.

4.10.3 Miscellaneous factors

Household which offers fresh fruits to guest spend more on fruits and vegetables. This variable is highly significant at 1% level. Others variables like distance from market, training on nutrition have no significant effect similar to findings (Nayga, 1995).

4.11 Market type

The majority (83%) of fresh fruits and vegetable were taken from the wholesaler by the sellers in Kanchanpur district of Nepal which is supported by the research (Cadilhon, 2003). Only 17% of the products were taken from retailers while operating their business by the sellers in the study area. As seller gets more margin in fruits and vegetables if they took directly from wholeseller which is supported (Shrestha, 2008). The sellers in the study area are quite scattered in location. In Bhimdatta they seem to be bit in clusters as compared to that of Laljhadi.

4.12 Marketing Channel

While studying marketing channels, two types of channels were considered, one directly from producers to consumers and other through intermediates. Second was seen profoundly dominant. While describing how the producers reached to their consumers, it was found that 30% of them use direct selling channel while 70% of them sells their commodity through the intermediate channels. This is the general characteristics of Nepalese marketing too. Consumers are not directly associated with the producers. Producers have lack of knowledge on marketing and do lack market information (Malla, 2021)

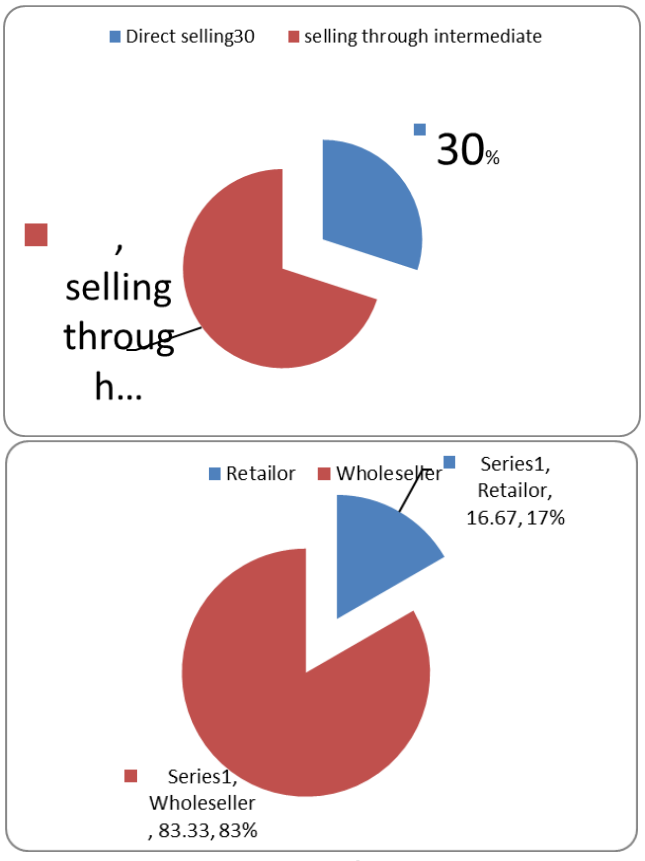

Figure 10: Market type

5. Conclusion

Demand for fruits and vegetable has been stimulated by numerous socio-demographic and lifestyle changes including shifts in the income distribution and prices. The consumption of vegetables and fruits rises with income and seasonal availability in context of Kanchanpur district. For increasing the consumption of fruits and vegetable home production should be promoted. Descriptive statistics along with trend analysis and linear regression model were used for analysis of the data.The total population under study was dominated by Brahimin (38.33%) and Chettries (28.33%) followed by Janjati (23.33%) and Dalit (10%). Agriculture as the major occupation for the people of both area i.e 48.33%. Farmers' in the study area are gradually diverted towards other livelihood options like business, service and remittance. 61.67% of total household were dominated by male while only 38.33% were female dominated. Majority of population (60.03%) was economically active with average 5.78 members in the family in study area. The vegetable producing area in Laljadi was in increasing trend whereas decreasing trend in Bhimdatt but number of fruit trees were increasing there. The expenditure on fruits and vegetables of farmers was higher during festivals season. Most of the farmers reported that low family income is the major factors for shrinking the demand of fruits and vegetables and it was ranked in first position for that and price factor ranked 1st position for influencing trade.

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