Importance of Farming for Employment Generation: Perspective of Rural Farmers from Selected Districts of Bhutan

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A R T I C L E   I N F O

A B S T R A C T

Purpose: This research paper investigates an insight of rural farmers on the key factors that inversely impact agricultural productivity in one of the densely populated districts of Bhutan. Further, it examines the impact of selected factors on farming as the potential for employment generation in the same district and tries to generalize the findings, especially in the context of rural areas of Bhutan.

Design/Methodologies/Approach: The research is conducted on the baseline data collected from the respondents of Chukha district of Bhutan. Data were collected with the help of a structured schedule as most of the respondents were farmers with little or no basic education background. The findings, however, have been supported by available literature to validate the same. A total of 376 respondents were included from three blocks (Bongo, Chapcha, and Darla) of the said district and their responses were examined and interpreted using ANOVA based on the age and qualification of the respondents. Also, regression analysis was run to understand the impact of such perception on taking up farming as a potential for employment generation by the farmers.

Findings: Both age-wise and education-wise analysis reveals the low perception of farmers regarding crop loss(CL), lack of resources (farming and technology) (LoR), threats from wild animals (TWA), lack of technical and financial accessibility (LTFA) and parents and peer pressure (PPP) as various factors impacting agriculture productivity. On the other hand, most of the farmers do not perceive CL, LoR, TWA, LTF, and PPP as strong determinants towards factors impacting agricultural productivity in their respective Gewogs as shown by regression analysis.

Research Limitations: The major limitation of the study is that the study is limited to the extensive review.

Managerial Implications: The study will help to give insight to the employment opportunities in the agriculture sector.

Originality/Value: The study is mainly based on baseline data and is expected to have some significant impact on various stakeholders of the respective gewog in particular and the country in general.

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Introduction

Farming/Agriculture is and has always been the significant driver for employment generation among most of the world economies. It acts as a backbone of the economy for developing nations and Bhutan is not an exception. Almost 60% of the total population in the country earns their livelihood from agriculture (Katwal et al., 2015; Royal Government of Bhutan, 2014). A sustained growth in the past three years has been seen in the production of crops like potatoes, chilies, wheat, and barley (National Statistics Bureau, 2018). However, no such increase has been noticed among livestock, forestry and mining, and other principal crops which are attributed to income and employment generation (ibid).

Farmers' perspectives of willingness and attitude towards farming are crucial for enhancing agricultural productivity in particular and employment generation in general. Effective farming depends on many factors in which the willingness and capacity of the farmers and the extent of labor they could provide are inevitable (Miller et al., 2004). Of late, a noticeable decline has been reported in youths' participation in farming supported by an increased rate of rural-urban migration (Tobgay, 2006). Besides the government's efforts to make Bhutan as the first organic country in the world by the year 2020 (Royal Government of Bhutan, 2012), there exist significant factors affecting the perception of youth on agriculture-related employment opportunities in the country. A few kinds of literature were found on rural development in the country. However, factors affecting agricultural productivity and its promotion as a potential area for employment generation, especially at Gewog (block) level are not available. This research, therefore, attempts to unveil the perception of rural farmers on the key factors that impact agricultural productivity and also the importance of farming for employment generation, particularly in three Gewogs (Bongo, Chapcha, and Darla) of Chukha Dzongkhags (district).

Literature Review

Perception of Farmers on Factors Impacting Agricultural Productivity

Globally, the low agricultural productivity of the important food cereals leading to food insecurities has become a serious concern. The world today is of the view that depleting resources, the mounting population, and shifting climate has amplified the concern about agricultural productivity (Jha et al., 2020). Some of the factors are not in human control and for those factors, the farmers do not have many grievances. Farmers are generally more concerned about the common factors of production. A study by Rehman et al., (2019) states that improved seed distri-bution, fertilizer consumption, credit allocation, and accessibility of water (irrigation) have a constructive impact on the agricultural yield and the agricultural gross domestic products (AGDP).

Besides, there has been a big challenge in the agricultural sector posed by the small insects and animals. The agricultural yield is drastically reduced by the arthropods in most of the developing countries however; there is a dearth of data to validate the same. One study by Sharma et al., (2017) states that arthropods may be destroying around 18-20% of the annual crop production worldwide estimated at a value of more than US$470 billion. Further, farmers are also of the view that over time, the function of the soil will play a vital role; it ensures productivity and the farmers strongly feel that "generation and support of microorganisms useful for agricultural cultures" carry the highest importance (Petrescu-Mag et al., 2020).

Bhutan's agricultural practice is more of a semi-subsistence in nature. Since the farmers in Bhutan solely depend on their agricultural produce for revenue generation for the family, agriculture is inevitable for survival in the country. The agricultural sector has employed a total of 56% of the workforce in Bhutan and it is the central foundation of income for the farmers Asian Development Outlook, (2015). The ADB shared that Bhutan needs to improve the agricultural sector to help achieve more balanced and inclusive growth in the economy (ibid).

Bhutan has numerous invasive plant species and some of them are among the world's worst ones. Spread of such invasive species is recognized as one of the major threats to biodiversity globally and they have negative impacts on nature, agriculture, livestock, and human health. A study conducted by Tshewang

et al., (2020), found weed as one of the significant threats that may cause production loss of rice to the extent of 50% in the country.

Although the agricultural sector in Bhutan has received the highest attention, however, the agricultural practice and the productivity have gone through a major change along with a few crucial challenges. The need of the country has triggered a call of the nation to bring in the maximum manpower to the agricultural sector. Government's concern and effort, therefore, got materialized and as of 2020, the agriculture sector employs around 51 percent of the total employed inhabitants of the Nation (National Statistics Bureau, 2020).

Agriculture Productivity for Employment Generation

Agricultural sector has been providing the highest employment opportunity globally. According to Wikipedia, agriculture accounted for 35.9% of the GDP of the Bhutan, thus it acts as a dominant part of the economy (Wikipedia, 2021). It also states that over 95% of the women population in Bhutan work in the agriculture sector (Grid Arendal, 2014). The role of agriculture in terms of providing employment opportunities is, therefore, significant in Bhutan.

Perception of youth towards farming usually varies based on their living area, age, and qualification. People living in rural areas were found to perceive agriculture as a better option for employment. Further, youth who have experienced or exposure to the farm are likely to accept agriculture as one of the career-based opportunities for employment (Pelzom & Katel, 2017). A few factors that impact negatively youth's perception were reported as crop loss, farming constraints, threats to crops, lack of resources, lack of accessibility, peer pressure, and parental pressure (ibid). Of late, there have been some noble interventions from the government in which the implementation of the School Agricultural Program (SAP) by the Ministry of Education (MoE) is worth noting. The main intention of the program is to motivate the younger generation to take agriculture as employment (Royal Government of Bhutan, 2012). However, the real perception of youth on agriculture as an employment opportunity at the Gewog level has not been addressed yet. Hence, this research is an attempt to unveil the same.

Objectives

To explore the perception of rural farmers on the key factors impacting agricultural productivity and

To investigate the impact of selected factors on farming as the potential for employment generation.

Hypotheses

$H_1 - H_5$: Respondents' perception based on the age group is significantly different (below 30 yrs, 31-45 yrs, and above 45 yrs) towards CL, LoR, TWA, LTFA, and PPP

$H_6 - H_{10}$: Different educational groups (No formal education, below 10th std., 10th Std., higher secondary up to 12th std., graduate, and above graduate) perceived differently towards CL, LoR, TWA, LTFA, and PPP

$H_{11} - H_{17}$: There is a significant impact of farmers' perception on CL, LoR, TWA, LTFA, PPP, QF, and MI towards employment generation.

Research Style

Range and Treatment

Inferences of the study were arrived covering three Gewogs (Bongo, Darla, and Chapcha) of the Chukha district. The study covered only those respondents who are in the farming business. In total, five variables that are crop loss, lack of resources (farming and technology), threats from wild animals, lack of technical and financial accessibility, and parents and peer pressure were included as factors to understand the perception of farmers on factors impacting agricultural productivity. Later, all these factors along with other dummy variables were taken as independent variables to understand the impact of farming on the potential for employment opportunities by the farmers.

Sources of Data, Population, and Sample Detail

Primary data were collected from farmers residing in three Gewogs of Chukha district. It is evident that Chukha district has been doing well in terms of agricultural produce in the country. Among various agriculture products (cardamom, potato, paddy, ginger, mandarin, maize, and Areca Nut), Cardamom, Paddy and Potato are the highest-growing crops in the district (National Statistics Bureau, 2020). Besides, almost 70% of the population resides in the rural areas of this district depending on agriculture as the primary means of livelihood. Hence, the perception data of respondents on the importance of agriculture for employment generation was thought pivotal for drawing actual inferences from the study. Further, some of the secondary data from NSB, the RNR Census of Bhutan, the Statistical yearbook, and the Royal Government of Bhutan were taken to validate the findings of the study.

Out of the total population of 18,098 as found with the help of respective Gups (Blockhead), the required samples of 375 Krejcie & Morgan, (1960) arrived. The samples from each of the selected Gewog were finalized based on the size of the population. All data were collected from respondents through schedules in the form of face-to-face interviews.

Tools of Data Analyses

Various statistical tools were used to analyse the baseline data. Descriptive statistics were used to describe the characteristics of respective variables. On the other hand, ANOVA was used to understand the perception of farmers on factors responsible for agricultural productivity. Besides, Regression Analysis was run to unveil the impact of such perception on taking up farming as the potential for employment generation by the farmers.

Limitations and Future Scope of the Study

The baseline data were collected from three gewogs of only one district of the nation. The findings of the research therefore may not be generalized for the whole nation. Further, as the maximum numbers of respondents were less literate or illiterate, there may be some variation in their answers.

Discussion and Findings

Reliability Constructs (RC)

The test was run for all the dimensions separately. Cronbach alpha Malhotra et al., (2006) is the popular approach to measure reliability. Generally, a Cronbach alpha value of 0.7 and above is better. However, an alpha value less than 0.7 is also acceptable (Black et al., 2005), in case of a smaller number of items on each latent variable. Nunnally, (1978) said that a Cronbach alpha value will be quite low in case of a lesser number of items in the scale (fewer than 10). Cronbach, (1951) recommended that an alpha value of 0.5 to 0.7 is acceptable while a higher than 0.7 is considered as the scale of good internal consistency or reliability. The Cronbach Alpha value of 0.778 and 0.701 in case of threats from wild animals and lack of technical and financial accessibility of the first dimension that factors impacting agricultural productivity show the good blending of items. However, the same alpha values between 0.5 to 0.7 also show an acceptable range of remaining dimensions of lack of resources (farming and technology) and *parents and peer pressure*. The overall Cronbach Alpha values of two major dimensions (*perception of farmers on factors impacting agricultural* productivity and *perception of farming as the potential for employment generation*) on the other hand, are recorded well above 0.7 (0.832 and 0.728) (Table No. 1).

Demographic Profile of the Respondents

Table No. 2 depicts the demographic profiles of the sample respondents. Based on population proportion, Darla represents the highest sample (44%), followed by Bongo (36%) and Chapcha (20%). Similarly, 41% of the samples represent females whereas the remaining 59% consist of males. In terms of age, the largest number of respondents (183) falls within the age group of 31-45 years followed by above 45 years (120) and below 30 years (73). Larger percentage of the samples do not possess any formal education whereas only 1% of them belong to graduates. This is very obvious as

Table No. 1: Reliability Statistics

Sl. No.	Research Dimensions	No.of items	Cronbach's Alpha	Cronbach's Alpha
1.	Perception of crop loss	7	0.554	
2.	Perception of lack of resources (farming and technology)	10	0.551	
3.	Perception of threats from wild animals	7	0.778	
4.	Perception of lack of technical and financial accessibility	8	0.701	
5.	Perception of parents and peer pressure	7	0.623	
6.	Overall perception of farmers on factors impacting agricultural productivity	39		0.832
7.	Overall perception of farming as the potential for employment generation	13		0.728

Source: Calculated with the help of SPSS.

the targeted samples of this research were farmers. Similar to respondents' qualifications, almost 49% of the respondents fall under the no-income group whereas only 3% of them earn a monthly income of above Nu 25,000. Among all the respondents, 55% of them were found vegetable growers. Further, 44% of the respondents were found carrying farming business over 5-10 years followed by 39% having experience of more than 10 years in farming.

Age-wise Analysis Towards CL, LoR, TWA, LTFA, and PPP

Age-wise analysis (Table No. 3) reveals a low perception of farmers on all the selected variables. The mean value below 3 also suggests the fact that farmers of all age groups do not perceive all such factors as key hindrances for agriculture productivity in the selected gewogs. The in-depth analysis, however, shows variation among age groups in terms of their perceptions. Lowest mean value was found among the respondents of below 30 years whereas the highest mean value was obtained among those above 45 years towards CL as one of the factors impacting agricultural produce. In terms of LoR, TWA, and PPP, farmers aged between 31-45 years show the highest mean values (2.29, 3.02, and 2.61) whereas the lowest mean values were shown by those above 45 years of age group respondents. In the case of LTFA, farmers below 30 years were found almost neutral

whereas above 45 years age group farmers recorded the lowest mean value of 2.79. The comparative analysis also inferred that old-age farmers with their experience in farming consider such factors as hindrances for better productivity of agricultural produce in their respective Gewogs compared to the younger ones.

The ANOVA table (Table No. 4) shows the considerable difference among different age groups towards LoR, TWA, and PPP as P<.05. Such difference was, however, not found significant among various age groups towards CL and LTFA (P>.05).

The multiple comparison results (Table No. 5) signify that there is a considerable difference in the mean scores between the age group of below 30 years and above 45 years toward CL. However, the such difference does not exist among other age groups. In terms of LoR, farmers' age group of 31-45 years was found significantly different from those above 45 years. Similarly, respondents aged between 31-45 years were found different from those above 45 years towards TWA. No age group was found different from others towards LTFA whereas, only 31-45 years age group was found different from 31-45 years towards PPP. The analysis, therefore, does not accept H_1 and H_4 whereas; H_2, H_3, and H_5 are partially accepted.

Table No. 2: Demographic Characteristics

Respondents' Gewog	Frequency	Percent	Valid Percent
Bongo	137	36.4	36.4
Chapcha	72	19.1	19.1
Darla	167	44.4	44.4
Total	376	100.0	100.0
Respondents' Gender			
Male	223	59.3	59.3
Female	153	40.7	40.7
Total	376	100.0	100.0
Respondents' Age			
Below 30 years	73	19.4	19.4
31-45 years	183	48.7	48.7
Above 45 years	120	31.9	31.9
Total	376	100.0	100.0
Respondents' qualification			
No formal education	140	37.2	37.2
Below 10th std	112	29.8	29.8
10th std	64	17.0	17.0
Upto 12th std	56	14.9	14.9
Graduate	4	1.1	1.1
Total	376	100.0	100.0
Respondents' monthly income			
No income	183	48.7	48.7
Below Nu 5000	40	10.6	10.6
Between Nu 5001-Nu 9000	61	16.2	16.2
Between Nu 9001-Nu 25,000	80	21.3	21.3
Above Nu 25,000	12	3.2	3.2
Total	376	100.0	100.0
Types of farming activities			
Cereals	119	31.6	31.6
Vegetables	207	55.1	55.1
Fruits	7	1.9	1.9
Livestock	29	7.7	7.7
Others	14	3.7	3.7
Total	376	100.0	100.0
No. of years in farming activities			
Less than 5 years	64	17.0	17.0
5-10 years	167	44.4	44.4
More than 10 years	145	38.6	38.6
Total	376	100.0	100.0

Source: Obtained from SPSS.

Table No. 3: Descriptive Statistics

Variables	Age	N	Mean	Std. Deviation	Std. Error
Perception of Crop Loss (CL)	Below 30 years 31-45 years Above 45 years Total	73 183 120 376	1.9315 2.1093 2.2167 2.1090	0.80500 0.76967 0.84200 0.80420	0.09422 0.05690 0.07686 0.04147
Perception of Lack of Resources (Farming and Technology) (LoR)	Below 30 years 31-45 years Above 45 years Total	73 183 120 376	2.0685 2.2896 1.8250 2.0984	0.76972 0.98240 0.94079 0.95129	0.09009 0.07262 0.08588 0.04906
Perception of Threats from Wild Animals (TWA)	Below 30 years 31-45 years Above 45 years Total	73 183 120 376	2.6849 3.0164 2.6583 2.8378	0.91099 0.94040 1.11894 1.00811	0.10662 0.06952 0.10214 0.05199
Perception of Lack of Technical and Financial Accessibility (LTFA)	Below 30 years 31-45 years Above 45 years Total	73 183 120 376	2.9452 2.8852 2.7917 2.8670	0.76177 0.87890 0.99491 0.89644	0.08916 0.06497 0.09082 0.04623
Perception of Parents and Peer Pressure (PPP)	Below 30 years 31-45 years Above 45 years Total	73 183 120 376	2.4795 2.6175 2.2833 2.4840	0.95902 1.11243 1.14630 1.10261	0.11224 0.08223 0.10464 0.05686

Source: Calculated from SPSS.

Table No. 4: ANOVA

Variables	Age	Sum of Squares	df	Mean Square	F	Sig.
Perception on Crop Loss	Between Groups Within Groups Total	3.691 238.838 242.529	2 373 375	1.845 0.640	2.882	0.057
Perception on Lack of Resources (Farming and Technology)	Between Groups Within Groups Total	15.726 323.633 339.359	2 373 375	7.863 0.868	9.063	0.000*
Perception on Threats from Wild Animals	Between Groups Within Groups Total	11.408 369.696 381.104	2 373 375	5.704 0.991	5.755	0.003*
Perception on Lack of Technical and Financial Accessibility	Between Groups Within Groups Total	1.188 300.163 301.351	2 373 375	0.594 0.805	0.738	0.479
Perception on Parents and Peer Pressure	Between Groups Within Groups Total	8.094 447.810 455.904	2 373 375	4.047 1.201	3.371	0.035*

Source: Calculated from SPSS

Note:. The mean difference is significant at the 0.05 level*

Table No. 5: Multiple Comparisons

Dependent Variable	Age group		Mean Difference	Std. Error	Sig.
Perception on Crop Loss	Below 30 years	31-45 years	-0.17778	0.11077	0.245
		Above 45 years	-0.28516*	0.11877	0.044
	31-45 years	Below 30 years	0.17778	0.11077	0.245
		Above 45 years	-0.10738	0.09399	0.489
	Above 45 years	Below 30 years	0.28516*	0.11877	0.044
		31-45 years	.10738	0.09399	0.489
Perception on Lack of Resources (Farming and Technology)	Below 30 years	31-45 years	0-.22112	0.12895	0.201
		Above 45 years	0.24349	0.13826	0.184
	31-45 years	Below 30 years	0.22112	0.12895	0.201
		Above 45 years	0.46462*	0.10942	0.000
	Above 45 years	Below 30 years	-0.24349	0.13826	0.184
		31-45 years	-0.46462*	0.10942	0.000
Perception on Threats from Wild Animals	Below 30 years	31-45 years	-0.33146*	0.13782	0.044
		Above 45 years	0.02660	0.14777	0.982
	31-45 years	Below 30 years	0.33146*	0.13782	0.044
		Above 45 years	0.35806*	0.11694	0.007
	Above 45 years	Below 30 years	-0.02660	0.14777	0.982
		31-45 years	-0.35806*	0.11694	0.007
Perception on Lack of Technical and Financial Accessibility	Below 30 years	31-45 years	0.05996	0.12418	0.879
		Above 45 years	0.15354	0.13315	0.482
	31-45 years	Below 30 years	-0.05996	0.12418	0.879
		Above 45 years	0.09358	0.10537	0.648
	Above 45 years	Below 30 years	-0.15354	0.13315	0.482
		31-45 years	-0.09358	0.10537	0.648
Perception on Parents and Peer Pressure	Below 30 years	31-45 years	-0.13803	0.15168	0.634
		Above 45 years	0.19612	0.16264	0.450
	31-45 years	Below 30 years	0.13803	0.15168	0.634
		Above 45 years	0.33415*	0.12871	0.026
	Above 45 years	Below 30 years	-0.19612	0.16264	0.450
		31-45 years	-0.33415*	0.12871	0.026

Source: Calculated from SPSS

Note:. The mean difference is significant at the 0.05 level*

Qualification-wise Analysis of CL, LoR, TWA, LTFA, and PPP

Analysis based on respondents' qualifications (Table No. 6) reveals a low perception of factors impacting agricultural productivity. The mean values of 3 and less than 3 of all dimensions suffice this fact. One of the major reasons for such low perception may be less education of farmers. Education is considered to be important for bestowing awareness levels of employment-related farming among rural farmers. Farmers may be imparted with good education to be able to use mechanized equipment on the farm which will help enhance agricultural produce vis-à-vis employment generation (Matthew, 2011).

The comparative mean value among various qualification groups on CL and TWA shows the lowest perception by the 10th std. respondents whereas the highest perception were recorded among graduates. In terms of LoR and PPP, the 12th std group perceived the lowest perception and the highest perception

Table No. 6: Descriptive Statistics

Variables	Qualification group	N	Mean	Std. Deviation	Std. Error
Perception on Crop Loss	No formal education	140	2.1500	0.80399	0.06795
	Below 10th std	112	2.1161	0.77976	0.07368
	10th std	64	1.9375	0.79433	0.09929
	Upto 12th std	56	2.1786	0.87609	0.11707
	Graduate	4	2.2500	0.50000	0.25000
	Total	376	2.1090	0.80420	0.04147
Perception on Lack of Resources (Farming and Technology)	No formal education	140	2.2429	0.92036	0.07779
	Below 10th std	112	2.0714	1.01975	0.09636
	10th std	64	2.0000	0.77664	0.09708
	Upto 12th std	56	1.8750	1.04555	0.13972
	Graduate	4	2.5000	0.57735	0.28868
	Total	376	2.0984	0.95129	0.04906
Perception on Threats from Wild Animals	No formal education	140	3.0214	1.00694	0.08510
	Below 10th std	112	2.8482	0.99738	0.09424
	10th std	64	2.6563	1.11581	0.13948
	Upto 12th std	56	2.5536	0.85109	0.11373
	Graduate	4	3.0000	0.00000	0.00000
	Total	376	2.8378	1.00811	0.05199
Perception on Lack of Technical and Financial Accessibility	No formal education	140	2.5786	0.98235	0.08302
	Below 10th std	112	2.9911	0.87503	0.08268
	10th std	64	2.9531	0.62817	0.07852
	Upto 12th std	56	3.2321	0.80884	0.10809
	Graduate	4	3.0000	0.00000	0.00000
	Total	376	2.8670	0.89644	0.04623
Perception on Parents and Peer Pressure	No formal education	140	2.6214	1.15968	0.09801
	Below 10th std	112	2.4464	1.08087	0.10213
	10th std	64	2.4531	0.92461	0.11558
	Upto 12th std	56	2.2500	1.19469	0.15965
	Graduate	4	2.5000	0.57735	0.28868
	Total	376	2.4840	1.10261	0.05686

Source: Calculated from SPSS

by graduates. Similarly, no formal education group lack in terms of perceiving LTFA as compared to other groups. The analysis based on respondents' qualifications; therefore suggests that none of the educational groups perceive CL, LoR, TWA, LTFA, and PPP as the main hindrances of agricultural productivity in their respective Gewogs. ANOVA table (Table No. 7) suggests that the perception of respondents' towards TWA and LTFA are significant as P<.05 whereas such significant results are not found among remaining variables (P>.05).

Multiple comparison table (Table No. 8) reveals

none of the qualification groups being statistically different form each other towards CL, LoR and PPP. These inferences, therefore, do not accept H_6, H_7 and H_{10}. Similar findings have also been revealed by ANOVA table. In case of TWA, only no formal education group was found different from that of 12th std. group whereas other groups were not found different from each other. Similarly, none of the educational groups were found different from each other except that of no formal education group with below 10th std, 10th std. and 12th std. towards LTFA. The analysis thus, partially accepts H_8 and H_9.

Table No. 7: ANOVA

Variables	Groups	Sum of Squares	df	Mean Square	F	Sig.
Perception on Crop Loss	Between Groups Within Groups Total	2.474 240.055 242.529	4 371 375	0.618 0.647	0.956	0.432
Perception on Lack of Resources (Farming and Technology)	Between Groups Within Groups Total	7.063 332.296 339.359	4 371 375	1.766 0.896	1.971	0.098
Perception on Threats from Wild Animals	Between Groups Within Groups Total	11.472 369.632 381.104	4 371 375	2.868 0.996	2.879	**0.023***
Perception on Lack of Technical and Financial Accessibility	Between Groups Within Groups Total	21.383 279.968 301.351	4 371 375	5.346 0.755	7.084	**0.000***
Perception on Parents and Peer Pressure	Between Groups Within Groups Total	5.931 449.974 455.904	4 371 375	1.483 1.213	1.222	0.301

Source: Calculated from SPSS

Note:*. The mean difference is significant at the 0.05 level

Table No. 8: Multiple Comparisons

Dependent Variable	Respondents' qualification		Mean Difference	Std. Error	Sig.
Perception on Crop Loss	No formal education	Below 10th std 10th std Upto 12th std Graduate	0.03393 .21250 -0.02857 -0.10000	0.10198 0.12138 0.12719 0.40790	0.997 0.404 0.999 0.999
	Below 10th std	No formal education 10th std Upto 12th std Graduate	-0.03393 0.17857 -0.06250 -0.13393	0.10198 0.12605 0.13165 0.40932	0.997 0.617 0.990 0.998
	10th std	No formal education Below 10th std Upto 12th std Graduate	-0.21250 -0.17857 -0.24107 -0.31250	0.12138 0.12605 0.14719 0.41458	0.404 0.617 0.474 0.943
	Upto 12th std	No formal education Below 10th std 10th std Graduate	0.02857 0.06250 .24107 -0.07143	0.12719 0.13165 0.14719 0.41631	0.999 0.990 0.474 1.000
	Graduate	No formal education Below 10th std 10th std Upto 12th std	0.10000 0.13393 0.31250 0.07143	0.40790 0.40932 0.41458 0.41631	0.999 0.998 0.943 1.000

Dependent Variable	Respondents' qualification		Mean Difference	Std. Error	Sig.
Perception on Lack of Resources (Farming and Technology)	No formal education	Below 10th std	0.17143	0.11998	0.609
		10th std	0.24286	0.14280	0.435
		Upto 12th std	0.36786	0.14964	0.103
		Graduate	-0.25714	0.47991	0.984
	Below 10th std	No formal education	-0.17143	.011998	0.609
		10th std	0.07143	0.14830	0.98
		Upto 12th std	0.19643	0.15489	0.711
		Graduate	-0.42857	0.48158	0.901
	10th std	No formal education	-.024286	0.14280	0.435
		Below 10th std	-0.07143	0.14830	0.989
		Upto 12th std	0.12500	0.17317	0.951
		Graduate	-0.50000	0.48776	0.844
	Upto 12th std	No formal education	-0.36786	0.14964	0.103
		Below 10th std	-0.19643	0.15489	0.711
		10th std	-0.12500	0.17317	0.951
		Graduate	-0.62500	0.48981	0.706
	Graduate	No formal education	0.25714	0.47991	0.984
		Below 10th std	0.42857	0.048158	0.901
		10th std	0.50000	0.48776	0.844
		Upto 12th std	0.62500	0.48981	0.706
Perception on Threats from Wild Animals	No formal education	Below 10th std	0.17321	0.12654	0.648
		10th std	0.36518	0.15061	0.111
		Upto 12th std	0.46786*	0.15782	0.027
		Graduate	0.02143	0.50616	1.000
	Below 10th std 10th std	No formal education	-0.17321	0.12654	0.648
		0.19196	0.15641	0.735	
		Upto 12th std	0.29464	0.16336	0.373
		Graduate	-0.15179	0.50791	0.998
	10th std	No formal education	-0.36518	0.15061	0.111
		Below 10th std	-0.19196	0.15641	0.735
		Upto 12th std	0.10268	0.18264	0.980
		Graduate	-0.34375	0.51444	0.963
	Upto 12th std	No formal education	-0.46786*	0.15782	0.027
		Below 10th std	-0.29464	0.16336	0.373
		10th std	-0.10268	0.18264	0.980
		Graduate	-0.44643	0.51659	0.910
	Graduate	No formal education	-0.02143	0.50616	1.000
		Below 10th std	0.15179	0.50791	0.998
		10th std	0.34375	0.51444	0.963
		Upto 12th std	0.44643	0.51659	0.910

Dependent Variable	Respondents' qualification		Mean Difference	Std. Error	Sig.
Perception on Lack of Technical and Financial Accessibility	No formal education	Below 10th std	-0.41250*	0.11013	0.002
		Upto 12th std	-0.65357*	0.13735	0.000
		Graduate	-0.42143	0.44051	0.874
	Below 10th std	No formal education	0.41250*	0.11013	0.002
		10th std	0.03795	0.13612	0.999
		Upto 12th std	-0.24107	0.14217	0.438
		Graduate	-0.00893	0.44204	1.000
	10th std	No formal education	0.37455*	0.13108	0.036
		Below 10th std	-0.03795	0.13612	0.999
		Upto 12th std	-0.27902	0.15895	0.401
		Graduate	-0.04688	0.44772	1.000
	Upto 12th std	No formal education	0.65357*	0.13735	0.000
		Below 10th std	0.24107	0.14217	0.438
		10th std	0.27902	0.15895	0.401
		Graduate	0.23214	0.44959	0.986
	Graduate	No formal education	0.42143	0.44051	0.874
		Below 10th std	0.00893	0.44204	1.000
		10th std	0.04688	0.44772	1.000
		Upto 12th std	-0.23214	0.44959	0.986
Perecption on Parents and Peer Pressure	No formal education	Below 10th std	0.17500	0.13962	0.720
		10th std	0.16830	0.16618	0.849
		Upto 12th std	0.37143	0.17413	0.208
		Graduate	0.12143	0.55846	1.000
	Below 10th std	No formal education	-0.17500	0.13962	0.720
		10th std	-0.00670	0.17257	1.000
		Upto 12th std	0.19643	0.18024	0.812
		Graduate	-0.05357	0.56040	1.000
	10th std	No formal education	-0.16830	0.16618	0.849
		Below 10th std	0.00670	0.17257	1.000
		Upto 12th std	0.20313	0.20152	0.852
		Graduate	-0.04688	0.56760	1.000
	Upto 12th std	No formal education	-0.37143	0.17413	0.208
		Below 10th std	-0.19643	0.18024	0.812
		10th std	-0.20313	0.20152	0.852
		Graduate	-0.25000	0.56998	0.992
	Graduate	No formal education	-0.12143	0.55846	1.000
		Below 10th std	0.05357	0.56040	1.000
		10th std	0.04688	0.56760	1.000
		Upto 12th std	0.25000	0.56998	0.992

Source: Calculated from SPSS

 Note:. The mean difference is significant at the 0.05 level*

Regression Analysis for Farming as the Potential for Employment Generation

The overall analysis from the regression table (Table No. 9) reveals that only 19% ($R^2 = 0.190$) of the variance in the dependent variable (Impct_FPEO) is explained by independent variables. This result is also supported by ANOVA tables where most of the farmers do not perceive CL, LoR, TWA, LTF, and PPP as strong determinants towards factors impacting agricultural productivity in their respective Gewogs. The regression table also shows whether selected independent variables predict a dependent variable. Using the enter method; it was found that five independent variables explain a significant amount of variance in the perception of farmers on factors impacting agricultural productivity towards farming as *the potential for employment opportunities* ($F(7, 368) = 12.303$, p < 0.05,

$R^2 = 0.19$, $R^2_{Adjusted} = 0.17$). From the table, the coefficient value of two independent variables that are Crop Loss (CL) (Beta = 0.063, t(375) = 1.143) and Parents and Peer Pressure (PPP) (Beta = -0.047, t(375) = -0.638) do not significantly predict farming as *potential for employment opportunities in three gewogs*. Besides CL and PPP, all other independent variables significantly predict the factors impacting of farming for employment opportunities. For instance, Avg_LoR (Beta = -0.150, t(375) = -2.179, p<0.05), Avg_TWA (Beta = 0.108,t(375) = 1.633, p<0.10), Avg_LTFA (Beta = 0.365, t(375) = 6.706, p<0.05), Res_QF(Beta = -0.133, t(375) = -2.660, p<0.05) and Res_MI(Beta = 0.292, t(375) = 4.653, p<0.05).

The inferences drawn from the analysis reveal that farmers' perceptions of CL, LoR, TWA, LTFA, PPP, QF, and MI do have some impact

Table No. 9: Summary Results of Multiple Regressions on Factors Impacting Agricultural Productivity Towards Farming as Potential for Employment Opportunities

Independent Variables	Impct_PFPEG (Dependent variable)			
	B	Beta	t-values	Significance
Constant ($\mu\S_0$)	2.074	–	8.706	0.000
Avg_CL ($\mu\S_1$)	0.061	0.063	1.143	0.254
Avg_LoR ($\mu\S_2$)	-0.123	-0.150	-2.179	0.030*
Avg_TWA ($\mu\S_3$)	0.084	0.108	1.633	0.103**
Avg_LTFA ($\mu\S_4$)	0.0317	0.365	6.706	0.000*
Avg_PPP ($\mu\S_5$)	-0.033	-0.047	-0.638	0.524
Res_QF($\mu\S_6$)	-0.094	-0.133	-2.660	.0008*
Res_MI($\mu\S_7$)	0.172	0.292	4.653	0.000*
R = 0.435; R^2 = 0.190; Adjusted R^2 = 0.174				
(Sig 0.000), F (7, 368) = 12.303				

Source: Field Survey.

*Notes: *Significant at 5% level of error probability, **Significant at 10% level of error probability.*

Note: Avg_CL = Average figure of perception of farmers on Crop Loss, Avg_LoR = Average figure of perception of farmers on Lack of Resources (farming and technology), Avg_TWA = Average figure of perception of farmers on Threats from Wild Animals, Avg_LTFA = Average figure of perception of farmers on Lack of Technical and Financial Accessibility,

Avg_PPP = Average figure of perception of farmers on Parents and Peer Pressure, Res_QF = Respondents' qualification, Res_MI = Respondents' Monthly Income, Impct_PFPEG = Perception of Farming as Potential for Employment Generation

on accepting farming as an employment opportunity. The results thus, reject alternative hypotheses H_{11} and H_{15} (There is a significant impact of farmers' perception on CL and PPP towards employment generation) and accept remaining hypotheses H_{12}, H_{13}, H_{14}, H_{16}, and H_{17} (There is a significant impact of farmers' perception on LoR, TWA, LTFA, QF and MI towards employment generation) in three Gewogs of the research study. The perception of rural farmers for taking agriculture as an employment opportunity is decreasing worldwide in the recent past. In the West African region, employment in the agriculture sector has reduced to 54% in 2016 due to the primary reason for less interest among youth in taking agriculture as their occupation (Clunies et al., 2009). Besides, low returns, high input investments, limited access to land, and low investments in infrastructure have been attributed to the deterioration of the morale of farmers in taking farming activities (ibid).

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