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Factors Affecting Adoption of Sustainable Soil Management (SSM) Practices in Baglung District, Nepal

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Abstract

SSMP is the appropriate soil management technologies, very largely based on local resources, to mid-hill farming households with the aim of improving soil fertility and productivity, providing alternative cropping options and increasing the opportunities for food security and a cash income - and thereby enhancing livelihoods. Attracting farmers for SSM practices is still a challenge. Thus a comparative economics study was conducted between major vegetable producers who are adopters and non-adopters of the SSM practices. The research was conducted in Baglung district in 2015 and primary data were collected in Rayadanda and Damek VDCs. Pretested interview schedule from total of 120 respondents, 60 from each adopters and non-adopters category, was conducted. Descriptive statistics along with t-test for with-without approach, Cobb-Douglas production function and probit regression model were used to analyze the data. The total population of the sampled household was 765, out of which 51.37 percent were male and 48.63 percent were female. By analysing the adoption index the majority of the adopters were (46.67%) high level of adoption (farmers adopting more than 5 technologies, >58%), 33.33 percent respondent found at medium level of adoption (farmers adopting upto 5 technologies, =58%) whereas 20 percent were found at low level of adoption (farmers adopting less than 5 technologies). probit regression analysis focused on the 120 members adopting vegetable farming with sustainable soil management practices. The extent to which the model's independent variables used in prediction correctly predicted the dependent variable was investigated. probit regression analysis showed that, three variables were statistically significant for the level of adoption, they were; beneficiaries from project, technology demonstration and soil fertility. Adopters (beneficiaries from the project) of SSMP will have higher probability of adoption level, Demonstration of technology will have higher level of technology adoption and Likewise, the farmers already have good fertile land will have lower level of technology adoption.

Key words: *Factors, technology adoption, probit model, SSMP*

1. Introduction

The Sustainable Soil Management (SSM) Programme initiated in 1999 aimed to enable farmers in hilly regions of Nepal. The major objective is to enhance the livelihoods of farmers and improve the productive capacity of their land through better management of the soil while reducing reliance on external agrochemical inputs. This is to be achieved by means of several simple, low cost, yet profoundly effective local practices that could readily be adopted by farmers with a minimum of effort and investment. The so called "basket" of sustainable soil management practices includes six major practices; Cattle shed improvement (with provision for urine collection), improved farmyard manure (FYM) production and application, covering of FYM in the fields prior to incorporation, use of cattle urine as a fertilizer and bio-pesticide, incorporation of legumes in the crop rotation and vegetable and cash crop production (for income generation). The above practices were the initial primary techniques taught and spread to the farmers through system of training representative farmers in each district and having them work closely with farmer groups in their respective VDCs. During subsequent stages of the program, other practices or technologies have been added, such as, vermin-composting, effective microorganism for better compost preparation, use of plastic houses for vegetable production, small farm-ponds for rain water harvesting.

Nepal government has set up a lab to determine the level of fertilizer and pesticide chemicals present in vegetables sold within the Kathmandu valley. Nepal imported 345 tonnes of pesticides chemicals worth USD 3.8 million in the last fiscal year 2013/14, and 85 % of it was applied in vegetable production (MoAD, 2014). If the amount of chemicals applied in production and marketing cycle is not properly regulated the end consumers will be affected. Due to the amount of chemicals applied in vegetable production and their subsequent potential health hazard to end consumers, there is increasing demand on improving soil and human health and improving sustainability of production in an environmental. There is ever increasing input supply and decreasing trend of productivity which threat the livelihood of farmers in agriculture (NPG, 2003). Based on these problems and rational following objective was set up to study the factors affecting adoption of major SSM practices in vegetable production in Baglung as Baglung is only the project intervened district suitable for impact study. Among the SSM program introduced in the mid-hills, Baglung was one of the districts. In this district, we have observed slow but

progressive rise in number of farmers practicing the SSM practices. Although the farmers are interested in adopting the changes based on consumer demand, farmers are also reluctant to adopt SSM practices due to lack of economic study based on SSM practices. The adoption of SSM practices will lead to sustainable economic profit but it was observed that farmers will less financial liquidity were reluctant to take the risk. Thus a comparative economics study between the SSM adopters and non-adopters was especially necessary. The objective of our study was to compare the economics of SSM practices and agricultural profit between these two groups of farmers. The two VDCs of Baglung had both group of farmers and the program was implemented (1993). Thus to observe the long term socio economic impact of the SSM practices, the selected VDCs were best suited. During this study, factors affecting the major SSM practices in vegetable production will also be addressed.

- To assess the level of technology adoption
- To assess the factors affecting adoption of major SSM practices in vegetable production,

2. Materials and Methods

2.1 Sample and Sampling Procedure

A research was conducted in Baglung district of Nepal in 2015. Primary data were collected by lottery random sampling method in Rayadanda and Damek VDCs of the district mainly using pretested interview schedule was prepared for the collection of information's from the selected respondents. Different questions regarding the family size, land availability, source of income, vegetable production and sales, cost of production before and after SSM practices, knowledge and perception of SSM practices, adopted practices, factors affecting adoption etc. were collected by using the questionnaire. The specific questions from the questionnaire were asked and the answers were recorded, from total of 120 respondents 60 from each adopters and non-adopters category. The random sampling method was used to select household. Lottery method of random sampling was used for household identification.

2.2 Methods and Techniques of Data Analysis

After collection of necessary information it was coded and entered to computer for analysis. Data was fed to SPSS and analysis was done by using statistical packages for social sciences (SPSS 20), MS-excel and STATA 12.Descriptive statistics along with t-test for with-without approach, Cobb-Douglas production function and probit regression model were used for the analysis of the data.

2.3 Probit Regression Model

Probit model was used to quantify the probability of different factors affecting the high level of adoption of SSM practices. In many studies investigating the factor influencing the adoption of agricultural practices use has been made of probit models (Hattam, 2006; Gradebroek, 2002). The characteristic feature of probit models is that the effect of independent variables on dependent variables is non-linear. It is a statistical model which aims to form a relation between P probability values and explanatory variables and to ensure that the probability value remains between 0 and 1.

In the probit model, suppose Y_i be the binary response of the farmers and take only two possible values; Y = 1, if farmer's adoption level is more than 44% (mean value of technology adoption index) and Y = 0, if less than 44%. Suppose x be the vector of several explanatory variables affecting to the level of adoption and β, a vector of slope parameters, which measures the changes in x on the probability of the farmers to adopt the practice at higher level. The probability of binary response was defined as follows:

If Yi = 1; $Pr(Y_i = 1) = P_i$

$Y_i = 0$; $Pr(Y_i = 0) = 1-P_i$

Where, $P_i = E(Y = 1/x)$ represents the conditional mean of Y given certain values of X.

According to Nagler (2002) probit model constrains the estimated probabilities to be between 0 and 1 and relaxes the constraint that the effect of the independent variables is constant across different predicted values of the dependent variables. This is normally experienced with the Linear Probability Model (LPM). The advantage of probit model is that it includes believable error term distribution as well as realistic probabilities (Nagler, 1994).

There were several factors that affect to the level of adoption of the practice at the farm level. Decision to adopt at higher level might be influenced by several socioeconomic, demographic, institutional and financial conditions. The aim of the model is to predict the influence of variables (X) on the probability of adoption of sustainable soil management practices (Y, dependent variables). According to this, in the probit model the likelihood of farmers adopting SSM practices is a non-linear function of variables; Pr(Y=1)=(X, beta)

Model Specification

The probit model specified in this study to analyze farmer's level of adoption of sustainable soil management practices was expressed as follows:

$$Pr(Y) = b_0 + b_1 X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12}$$

Where, Pr (Y) = Probability score of adopting SSM practices at high level

X_1= Beneficiaries from project (Dummy)

X_2= Education of household head (Years)
X_3= Occupation of household head (Dummy)
X_4= Caste (Dummy)
X_5= Total land holding (508 m^2, Ropani)
X_6= Support received from organization (Dummy))
X_7= Technology demonstration (Dummy)
X_8= Soil fertility (Dummy)
X_9= Subsidy on technology (Dummy)
X_{10}= Livestock holding (LSU)
X_{11}= Members involved in agriculture (Number)
b_1, b_2.... b_{11}= Probit coefficient
b_0= Régression coefficient

2.4 With and Without Approach

This approach compares the conditions of the households with and without the project introduction.

2.5 Level of Technology Adoption

Households that reported to have used some package of technology were considered as adopters and those who have not used this package were considered non-adopters. The adoption score was calculated by the sum of points secured by the respondent. Different scores were assigned to the responses made by the respondent. The adoption score was calculated by the sum of points secured by the respondent. Different scores were assigned to the responses made by the respondent. Selected individuals were categorized into different categories of adopters' level as high adoption (farmers adopting more than 5 technologies), medium adoption (farmers adopting up to 5 technologies) and low adoption (farmers adopting less than 5 technologies). On this basis, adoption index was determined for adoption of SSM practices. Perception of the farmers on SSM based vegetable production was found from the interview. The level of technology adoption was calculated by using the following formula (Dongol, 2004).

$$\text{Adoption index (AI)} = \frac{\text{Total score obtained by an individual}}{\text{Maximum possible score}} \times 100$$

3. Results

3.1 Age Distribution of Respondents and Household Head

Individual's personality make up depend upon the age, since to the number of years a person lived is the major to the way in which an individual thinks. Young people are more adaptable and willing than older people to try out new innovations since old people believe in their old cultural way of doing things (Romuld & Sandham, 1996). However, Hofferth (2003) argued that younger people have lesser experiences in agricultural activities than older people in that they know the social and physical environments better than younger people. Taking innovative decision is mostly depend upon the age of the farmer. The farmers do gain experience with age but younger ones are generally expected to respond react and adapt faster than their elder counterparts.

The average age of the household head was 48 years ranging from 27 to 75 in total. It ranges between 47 to 71 for its adopters and 27 to 75 years for non-adopters.

Table 3. Distribution of the household head by age in the study area (2015)

Characteristics	Age of household head		Total
	Adopter	Non-adopter	
Minimum age	47.00	27.00	27.00
Maximum age	71.00	75.00	75.00
Mean age	47.00	49.00	48.00

3.2 Population Distribution

The total population of the sampled households was 765, of which 51.37 percent were male and 48.63 percent were female (Table 4). In adopters the total sampled population was 392 of which 52.81 percent were male and 47.19 percent were female whereas, in non-adopters percentage of male population was 49.87 and that of female was 50.13 out of total population 373. The average family size of the research site was 6.37, which was higher than the national average 4.7 (CBS, 2012).

Table 4. Distribution of the population of the sampled household by gender (2015)

Gender	Gender of Household		Total
	Adopter	Non-adopter	
Male	207 (52.81)	186 (49.87)	393 (51.37)
Female	185 (47.19)	187 (50.13)	372 (48.63)
Total	392 (100)	373 (100)	765 (100)
Average no. of Male	3.45	3.10	3.27
Average no. of Female	3.08	3.11	3.1
Average no. Family size	6.53	6.21	6.37

Figures in parentheses indicate percent

In both adopters and non-adopters, 75.80 percent were male headed family and remaining 24.20 percent were female headed household head out of 120 households that were sampled (Table 5). This result significantly specifies that Nepal is a country with patriarchal system.

Table 5. Distribution of sampled households by gender of household head (2015)

Gender of household head	Category of respondents		Total
	Adopter	Non-adopter	
Male	42 (70.00)	49 (81.70)	91 (75.80)
Female	18 (30.00)	11 (18.30)	29 (24.20)
Total	60 (100.00)	60 (100.00)	120 (100.00)

Figures in parentheses indicate percent

3.3 Family Structure and Family Size

From Table 9 it can be drawn that family size was greater in adopters than non-adopters. Average family size of the sampled household was 6.38 specially, 6.53 and 6.22 in adopters and non-adopters respectively. Average family size in the study area was higher than the national average of 4.7 (CBS, 2012). Similarly, the average family size of adopter (6.53), non-adopters (6.22) and the family size of total study site (6.38) all were higher than the district as well as national average. Higher family size may be due to the lower education status of the people in the study area.

Table 6. Family size of the household in the study area (2015)

Family size	Category of respondents		Total
	Adopter	Non-adopter	
Minimum	3.00	2.00	2.00
Maximum	15.00	14.00	15.00
Average	6.53	6.22	6.38

Among the sampled households, the minimum family size was found to be 2 and the maximum size was 15. Further, adopters showed the maximum family size of 15 and minimum size of 3 whereas in non-adopters maximum family size was 14 and minimum was found to be 2.

From the study it was found that most of the people preferred nuclear family compared to the joint one. In overall, 66.67 percent were found with nuclear family and remaining only 33.33 percent were found living jointly. The percentage of joint and nuclear family in adopters were 40 and 60 respectively and that of non-adopters were found 26.70 and 73.30 percent. In both the adopters and non-adopters the percentage of nuclear family was greater than the joint one (Table 7).

Table 7. Family type in the study area (2015)

Family size	Category of respondents		Total
	Adopter	Non-adopter	
Joint	24 (40.00)	16 (26.70)	40 (33.33)
Nuclear	36 (60.00)	44 (73.30)	80 (66.67)
Total	60 (100)	60 (100)	120 (100.00)

Figures in parentheses indicate percent

3.4 Ethnicity of the Respondents

From the study it was found that 62.50 percent of the respondents were Brahmin/Chettri as the dominated ethnic groups followed by Adabasi /Janjati with 34.16 percent and Dalit with 3.34 percent. The detail of the ethnic composition of the respondents in the VDCs of the study area is presented in the Table 8.

Table 8. Ethnic composition of the respondents in the study area (2015)

Ethnicity	Category of respondents		Total
	Adopter	Non-adopter	
Brahmin/Chhetri	42 (70.00)	33 (55.00)	75.00 (62.50)
Aadibasi/Janajati	16 (39.00)	25 (41.70)	41.00 (34.16)
Occupational caste	2 (03.30)	2 (03.30)	4.00 (3.34)
Total	60 (100.00)	60 (100.00)	120 (100.00)

Figures in parentheses indicate percent

3.5 Economically Active Population and Their Occupation

Studies by Ellis (2000) indicated that a larger number of economically active populations in a household generate a source of labor thus increasing the likelihood of adopting new technologies and this has a direct influence on household food security. The sampled population was categorized into three different age groups in which economically active population referred to the population belonging to the age group 16 to 59 years as considered by the government of Nepal. This is because the productive capacity of Nepalese people is considered to lie in this age group. Whereas, age group of less than and equal to 15 years and greater than and equal to 60 years were considered as economically inactive group although these group also contributed in the income of the family.

The study showed that majority of the farm household members i.e. 62.61 percent were economically active family members followed by 30.06 percent age group equal or less than 15 and 07.32 percent belonging to economically inactive group. The distribution of population is presented in the table 9.

Table 9. Distribution of sampled households by age in the study area (2015)

Age group	Category of respondents		Total
	Adopter	Non-adopter	
≤15 years	116 (29.59)	114 (30.56)	230 (30.06)
16-59 years	249 (63.52)	230 (61.66)	479 (62.61)
≥60 years	27 (06.89)	29 (7.77)	56 (07.32)
Total	392 (100)	373 (100)	765 (100)

Figures in parentheses indicate percent

The main occupation of the household head was categorized as agriculture, business and service in this study. Agriculture was the main occupation of the majority of the economically active population of the surveyed households which was 85.83 percent as compared to business 07.50 percent and service 06.67 percent (Table 10).

Table 10. Occupational pattern of the household head in the study area (2015)

Occupation	Category of respondents		Total
	Adopter	Non-adopter	
Agriculture	55 (91.70)	48 (80.00)	103 (85.83)
Business	1 (01.70)	8 (13.33)	9 (07.50)
Service	4 (06.70)	4 (06.70)	8 (06.67)
Total	60 (100.00)	60 (100.00)	120 (100.00)

Figures in parentheses indicate percent

3.6 Education Status of the Household Head, and Sampled Population

According to Ersado (2001) the number of years spent in formal education is one of important determinants of adoption of new technologies. Education catalyzes the process of information flow and leads the farmer to explore as wide as possible, the different pathways of getting information about a technology. Bester, Belete & Doni, (1999) also noted that illiteracy is one of the factors that limit economic, social, physical, technical and educational development in less developed countries. Educational considerations generally influence the adoption of new behavior of farmers.The education level was categorized as illiterate, literate, up to SLC and college level. May be due to various factors like geographical situation, age, income status, access to schools etc. the majority of household head were found literate from the study. Very few of household head was found illiterate whereas the percentage of household up to SLC and College level was medium in number in both adopter and non-adopters.

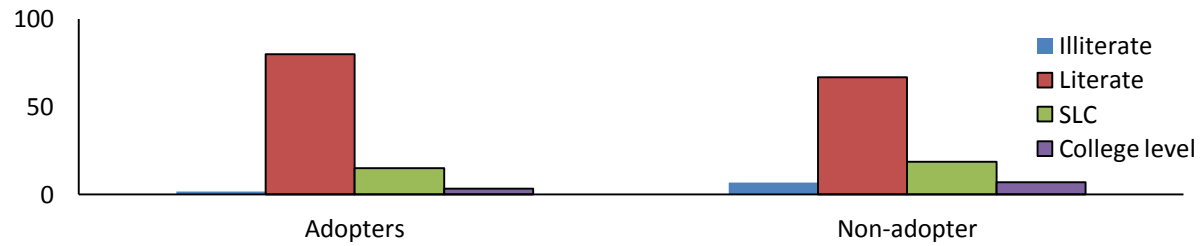

Figure 1. Education status of household head (2015)

Out of total sampled population from 120 households, it was found that 12.98 percent were illiterate whereas literate was 87.02 percent which is higher than the district average (i.e. 71.88 %) as well as national average 61 percent (CBS, 2012). The education level of the total sampled population is shown in the Table 11.

Table 11. Education level of the sampled household in the study area (2015)

Education level	Education Level		Total
	Adopter	Non adopter	
Illiterate	26 (8.56)	52 (17.51)	78 (12.98)
Literate	278 (91.44)	245 (82.49)	523 (87.02)
Total	304 (100)	297 (100)	601 (100)

Figures in parentheses indicate percent

3.7 Farm Size

Farm size is the total farmland owned by the household measured in certain unit. The average land holding of the respondents was found 0.74 ha which is lesser than the national average 0.83 ha 74.16 percent of the respondents had small farm size (0.50 ha) followed by 16.67 percent had medium farm size (0.50-1.00 ha.) and only 9.17 percent had large farm size (more than 1ha). Table 12 represents the land holding pattern of the sampled household.

Table 12. Size of the farm holding of respondent in the study area (2015)

Farm Size	Category of respondents		Total
	Adopter	Non-adopter	
<0.50 ha (small)	45 (75.00)	44 (73.30)	89 (74.16)
0.50-1.00 ha (medium)	12 (20.00)	8 (13.30)	20 (16.67)
>1.00 ha (large)	3 (05.00)	8 (13.40)	11 (9.17)
Total	60 (100.00)	60 (100.00)	120 (100.00)

Figures in parentheses indicate percent Mean farm size = 0.743 ha

3.8 Level of Technology Adoption and Factors Affecting the Level of Technology Adoption

Majority of the adopters i.e. 46.67 per cent had high level of adoption (>58%=mean+SD) of sustainable soil management practice. From the study 33.33 percent respondent found at medium level of adoption whereas 20 percent were found at low level of adoption. The mean level of adoption of the practice was 44.33 percent and mean standard deviation was 14.59. Whereas majority of non-adopters were low level of adoption i.e. 86.67 percent which is followed by medium level 11.67 percent and 1.67 percent.

Table 13. Level of adoption of SSM practices by the farmers in the study area (2015)

Level of adoption	Adoption		Total
	Adopter	Non-adopters	
<44 (Low)	12 (20.00)	52 (86.67)	64 (53.33)
44-58% (medium)	20 (33.33)	7 (11.67)	27 (22.50)
>58% (high)	28 (46.67)	1 (1.67)	29 (24.17)
Total	60 (100)	60 (100)	120 (100)

Figures in parentheses indicate percent Mean level of adoption = 44.33%

3.9 Factors Affecting the Level of Technology Adoption

To identify the factor influencing level of technology adoption, probit regression was used. Farmers in the study area were found to adopt the practice at different level. The adoption level by the farmers in the study area was categorized into binary response by the adoption level of more than 44%= 1 and 0 otherwise.

Table 14. Factors affecting the level of adoption of SSM practices in the study area (2015)

Variables	coefficients	P>|z|	Standard error	dy/dx[b]	S.E[b]
Beneficiaries from Project (Dummy)	1.354**	0.036	0.644	0.501	0.204
Education of Household Head (Years)	0.009	0.841	0.046	0.003	0.018
Occupation of Household Head (Dummy)	0.471	0.365	0.521	0.182	0.191
Caste (Dummy)	0.291	0.459	0.393	0.115	0.154
Total land holding (Ropani)	0.142	0.796	0.553	0.056	0.220
Support received from Organization (Dummy)	0.477	0.395	0.561	0.188	0.217
Technology Demonstration (Dummy)	1.124**	0.034	0.529	0.422	0.173
Soil Fertility (Dummay)	-1.632***	0.004	0.565	-0.481	0.105
Subsidy on Technology (Dummy)	-0.153	0.772	0.530	-0.061	0.209
Livestock Holding (LSU)	-0.022	0.726	0.064	-0.008	0.255
Members involved in Agriculture (No.)	-0.400	0.837	0.194	-0.015	0.077
Constant	-1.594	0.622	0.011	-	-

Summary Statistics

Numbers of observation	120
Log likelihood	-46.65
LR chi^2 (11)	72.51^{***} ($prob>chi^2$ =0.000)
$prob>chi^2$	0.0000
Pseudo R^2	0.437
Cases predicted correctly (%)	48.61
Goodness of fit test	

*** Significant at P = 0.01; ** significant at P = 0.05;

[b] Marginal change in probability evaluated at the sample means.

Probit regression analysis focused on the 120 members adopting vegetable farming with sustainable soil management practices. The extent to which the model's independent variables used in prediction correctly predicted the dependent variable was investigated. Overall, the model predicted 48.61 per cent of the samples correctly. Thus the models developed may be said to be consistent and meaningful. The wald test (LR chi^2) for the model indicated that, the model had good explanatory power at the 1% level. The Pseudo R^2 was 0.437. For the interpretation of the model, marginal effects were driven from the regression coefficients, calculated from partial derivatives as a marginal probability shown in Table 14.

Probit regression analysis showed that, three variables were statistically significant for the level of adoption, they were; beneficiaries from project, technology demonstration and soil fertility. Eight other variables namely education of household head, occupation of household head, caste, farm size, support received from organization, subsidy on technology, livestock holding, and members involved in agriculture were statistically non-significant.

Adopters (beneficiaries from the project) of SSMP, higher will be the probability of adoption level. The study revealed that, adopters were positively significant (P<0.05) and keeping other factors constant, being beneficiaries of the SSMP, probability of level of adoption would increase by about 50 percent. This might be due to the availability of support from the project.

Demonstration of technology will have higher level of technology adoption. The study showed that, demonstration of technology was positively significant (P<0.05) and keeping other factors constant, whether the project established technology demonstration, the probability of level of adoption would increase by about 42 percent.

Likewise, the farmers already have good fertile land will have lower level of technology adoption. The study showed that, the already good fertile land having farmers were negatively significant (P<0.05) and keeping other factors constant, farmers having good fertile land, the probability of level of adoption would decrease by about 48 percent.

4. Discussion

The research was conducted in Baglung district of Nepal in the year 2015 because it is one of the vegetable growing hilly districts of Nepal with SSMP implementation. The study area, Baglung district, lies in Dhaulagiri Zone under Western Development region. It is bordered with Parbat district in the east, Rolpa and Rukum districts in the West, Myagdi district in the North and Pyuthan and Gulmi districts in the South. Headquarter of this district is Baglung Bazaar situated east of the district. The elevation varies between 600 m and 4,690 m above mean sea level (DADO, 2014). The district has sub-tropical climate lower flat terrains, sub-temperate climate in lower hills and temperate climate in high mountains. The district receives, on an average; an annual precipitation of 188.45 cm, maximum average temperature 23.51^0c and minimum average temperature 13.91^0c (DADO, 2014).

The total population of the study district is 2, 68,613. The ratio between the female and male is 1.28. The population growth rate is -0.12% (which may be due to migration and Foreign Service) and average family size is 4.37. The population density of the district is 151 people per square kilometer (CBS, 2012).

The average literacy rate of the district is 71.88% which is 80.59% on male and 65.29% on female. Within the district there are 378 primary school, 88 lower secondary school, 64 secondary school and 63 higher secondary school comprising of 26547 total students of the district (DADO, 2014).

Out of total 46148 ha of arable land, 30,476 ha land is used. There are 6 ASCs (Agriculture Service Center) and 1 DADO (District Agriculture Development Office) office to provide agriculture service to the farmers. Rice, maize, finger millet, wheat, Cauliflower, cabbage, potato, bean were the major crop of the study area. There are of 49,217 number of farmers farming 59,250 number of cattle, 85,697 buffalo, 1,06,858 goat and 1,27,235 poultry producing 23,749 mt milk, 2,509 mt meat, 2,31,00,000 egg and 10114 kg wool in the district (DADO, 2014).

During the year of 2070/71, there are about 1733 ha of land covered by vegetables producing 19868 mt of vegetable maintaining 11.46 mt/ha productivity of vegetable of Baglung district (DADO, 2014).

To study the socioeconomic impact of SSM practices with the major specific objectives as mentioned in the objective section. Primary data were collected in Rayadanda and Damek VDCs of the district mainly using pretested interview schedule from total of 120 respondents 60 from each adopters and non-adopters category.

Descriptive statistics along with t-test for with-without approach, Cobb-Douglas production function and Probit regression model were used for the analysis of the data.

The important findings, besides the socio-demographic findings; among adopters of SSM practices in the study area it was found that the majority of the adopters were high level of adoption (46.67%) and non-adopters (86.67%) were low level of adoption of SSM practices. Probit Model showed that, three variables were statistically significant for the level of adoption, they were; beneficiaries form the project, technology demonstration and soil fertility with R^2 value 0.437 and cases predicted percentage 48.61.

The major findings of this was supported by Karki & Bauer, (2004) revealed that timely availability of credit, years of schooling, off-farm income, extension service, project intervention, farm size and experience of the farmers significantly influenced their adoption decisions. And Oladele & Wakatsuki, (2011) used the Probit model and showed that significant variables include yield, participation in on farm demonstration, contact with Sawah agent, varietal adaptability, market price, lodging proneness, age and farming experience in Nigeria and Ghana.

5. Conclusions

Majority of the adopters i.e. 46.67 per cent had high level of adoption (>58%=mean+SD) of sustainable soil management practice. From the study 33.33 percent respondent found at medium level of adoption whereas 20 percent were found at low level of adoption. The mean level of adoption of the practice was 44.33 percent and mean standard deviation was 14.59. Whereas majority of non-adopters were low level of adoption i.e. 86.67 percent which is followed by medium level 11.67 percent and 1.67 percent.

Probit Model showed that, three variables were statistically significant for the level of adoption, they were; beneficiaries form the project, technology demonstration and soil fertility with R^2 value 0.437 and cases predicted percentage 48.61.

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