Farmer's socio-economy and their perception to changing climate. Evidences from Chitlang and Namsaling of Nepal

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Abstract

Agriculture is important sector in the world. It is important especially for developing countries where majority of the people are dependent on agriculture for their livelihood. As agriculture is highly dependent on the climatic conditions, it is very important to know the socio-economy of the farmers and their perception towards the rapidly changing climate nowadays. Further, the climatic variability will have an effect on the agriculture productivity which will have an effect on the socio-economy of the farmers. Thus it is very important to understand the socio-economy of the farmers and their perception towards changing climate. So, this paper tries to understand the farmer's socio-economy and their perception towards the changing climate. The descriptive analysis of the socio-economy of Chitlang and Namsaling Village development committee (VDC) found that there is very high income disparity among the people in both VDCs. Income disparities was higher in case of Chitlang than in Namsaling. Further, in Namsaling VDC household were more dependent on agriculture than in Chitlang. Also, in case of Namsaling there were three categories of farmers marginal, small and large according to the landholding whereas in Chitlang there were only marginal and small farmers. On further analysis of socio-economic characteristics of both the VDC it was found that people in the Namsaling VDC were more educated, that is, the literacy rate of the Namsaling VDC was higher than that of Chitlang. But, the resources like availability of water for irrigation was found to be more scare in Namsaling than in Chitlang. So, while analyzing their perception towards changing climate in the area, in Namsaling more people noticed increase in temperature and decrease in rainfall than in case of Chitlang. Further, the people have started to notice changes in plant ripening and increase in plant diseases. Finally, it was seen that in Namsaling where people were more aware and educated have started to notice small changes in the area more than that in the Chitlang.

Introduction

Nepal is a mountainous country situated in south Asia. The total area of Nepal is 147,181 sq. km. With an average width of only about 150 km, the altitude range varies from 161 meters above sea level (masl) to 8,848 masl (CBS, 2004). The agricultural land in Nepal is 42100 sq. Km. as of 2009 (The World Bank, 2011). In rural area agriculture is the main livelihood option so economy of Nepal is significantly dependent on agriculture. Approximately 33.85% of GDP came from agriculture in 2009, down from 40% in 2000. Nepal has tropical to tundra climate, and it receives about 80% of annual precipitation during a very short period of summer months from June to September. Irrigation covers only 27.74% of the total agricultural land in Nepal (The World Bank, 2011). Therefore people mostly rely on the rain-fed agricultural system. So any change in climatic factors will have mostly adverse effect on farmers especially those who have little capacity to adapt to the change.

Adaptation to any change in climate will depend on interaction in the society which depends on social, cultural and economic status. The interaction among the society depends on what the society perceives which again depends on their social and economic context and the environment around them. The perception of person is very much interlinked with the social and economic situation of the person as well as their behavior. For any adaptation measures it is very essential to know social and economic situation and their perception towards the change as they are interlinked with each other. This paper tries to understand the socio-economic status of the farmers in the two study area and their perception towards the changing climate.

Methodology and Study Area

Study Area

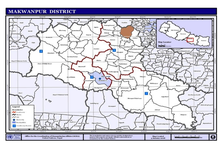

Figure 1: Map of Makwanpur district showing Chitlang VDC

Figure 2: Map of Ilam district showing Namsaling VDC

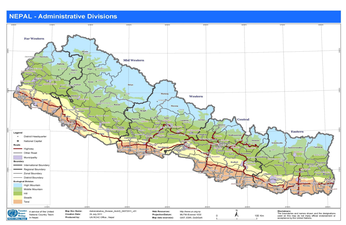

Figure 3: Map of Nepal showing administrative boundry

Methodology

- The study uses the statistical descriptive method for the analysis of data.
- Field visit was carried out primarily in two VDCs, namely Chitlang and Namsaling.
- Stratified random sampling was used to collect primary data which consist of 60 households from each VDCs.

Socio-Economic Status of the Study Area

Household Income Distribution

Table 1: Household income according to quintile

VDC	Income (NRs.) Us$1=NRs. 88				
	<20%	20%-40%	40%-60%	60%-80%	>80%
Chitlang	30075	81666	118608	163180	349617
Namsaling	30663	54647	90300	131524	229936

Source: Field survey, 2010

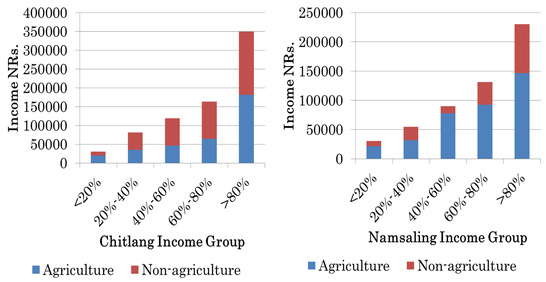

Figure 4: Income Composition in Different Quintile

Source: Field survey, 2010

Land Distribution in Chitlang and Namsaling VDC

Table 2: Landholding among farm household

VDC	Sampled Household	Land holding		
		Marginal <0.5 ha	Small 0.5-2.0 ha	Large >2.0 ha
Chitlang	Total Land(ha)	10.06(27.4)	26.66(72.6)	-
	Household	31(51.7)	29(48.3)	-
Namsaling	Total Land(ha)	3.2(5.6)	46.36(80.3)	8.14(14.1)
	Household	11(18.3)	46(76.7)	3(5)

Source: Field survey, 2010

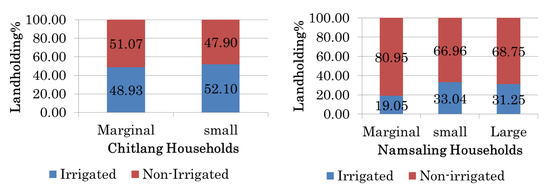

Figure 4: Household landholding type in Chitlang and Namsaling

Source: Field survey, 2010

Other Socio-Economic Characteristics of Chitlang and Namsaling VDCs

Table 3: Socio-economic characteristics of Chitlang and Namsaling VDCs

Variables	VDC		P value
	Chitlang	Namsaling	
Population of Sample HH			
Male	175(46.8%)	152(54.9%)	
Female	199(53.2%)	125(45.9%)	
Family size	6.18	4.62	
Literacy rate	60.9%	83.3%	
Dependency ratio	0.39	0.52	0.2098
Average livestock holding (TLU)	1.6	2.4	0.0059**
Average landholding (ha)	0.61	0.96	0.0004***
Average irrigated landholding (ha)	0.31	0.31	0.9242
Average radio holding (No.)	0.98	0.77	0.0206**
Average mobile holding (No.)	0.98	0.78	0.0192**
Average Credit (NRs.)	16683.33	58866.67	0.0053***
Average time to reach (min)			
Road	12.57	28.5	0.0001***
Health	32.25	36.83	0.3416
School	19.9	27.67	0.0297**
Market	26	30.83	0.1191
Agriculture services	29.92	37.92	0.0728*
Livestock services	34.83	40.58	0.2312
Average amount spend on (NRs.)			
Seed	3282.05	2240	0.0767*
Fertilizer	6808.33	3381.93	0.0000***
Pesticides	1481.67	1757.14	0.5864

Source: Field survey, 2010

Dependency ratio is the ratio of economically non-active member to economically actively member

$$\text{Dependency ratio} = \frac{\text{(Number of aged 1-14) + (Number of aged 65 and over)}}{\text{(number of aged 15-64)}} \times 100$$

Tropical Livestock Unit (TLU) used are as follows
cattle=0.07 sheep and goat = 0.10, pigs = 0.20 and chicken = 0.10
(source: Maltsoglou and Taniguchi, 2004)

Perception to changing climate in Chitlang and Namsaling VDC

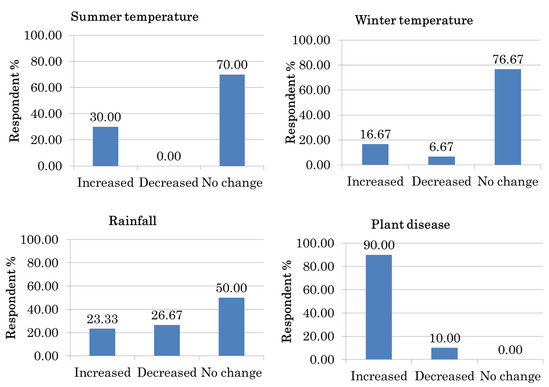

Figure5: Perception of Household in Chitlang VDC

Source: Field survey, 2010

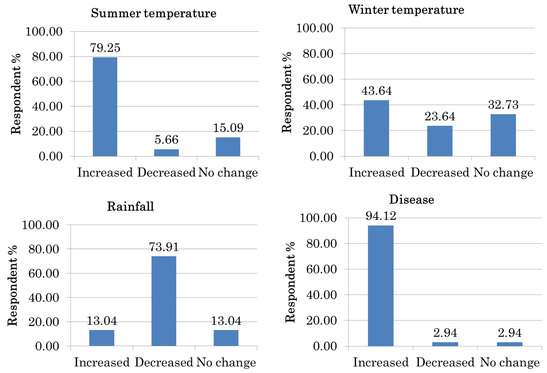

Figure6: Perception of Household in Namsaling VDC

Source: Field survey, 2010

Relationship between socio-economic variables and perception to climate variables

Table 4: ANOVA F-test between perception of farmers and climate variables

Study Area	Variables	Summer temp.		Winter temp.		Rainfall	
		F	Significance	F	Significance	F	Significance
Namsaling	Education	4.60	0.006**	1.38	0.260	1.44	0.241
	Ag. Income	0.01	0.999	0.51	0.675	1.67	0.185
	Landholding	3.47	0.022**	2.44	0.074*	3.04	0.037**
	Irrigation	0.82	0.487	1.71	0.176	1.18	0.328
	Radio	0.76	0.521	2.77	0.051*	5.61	0.002**
Chitlang	Education	0.34	0.710	0.63	0.598	0.54	0.655
	Ag. Income	3.49	0.037**	5.67	0.002**	0.77	0.557
	Landholding	1.75	0.184	0.38	0.767	0.49	0.692
	Irrigation	0.57	0.571	2.88	0.045**	2.42	0.077*
	Radio	4.40	0.019**	0.87	0.467	0.11	0.951

Conclusion

The descriptive analysis revealed that there is a huge income disparity among the income quintile groups in both VDCs. In Namsaling VDC, the cash income from agricultural sources were dominant than non-agricultural income source. This is mainly due to the fact that people in Chitlang have more opportunities from non-agricultural income sources but in the case of Namsaling VDC, they have limited opportunities and also that the farmers in Namsaling VDC are more organized and agriculture is being commercially developed. Analysis of other socio-economic characteristics found that the average literacy rate of sampled households in Namsaling was higher than in Chitlang, but the average dependency ratio in Chitlang was found to be lesser compared to Namsaling.

The analysis of perception of the respondents was seen and nearly all the people in both VDCs have not heard about the term climate change. Further, regarding the changing climatic variable, it was found that in Chitlang VDC, majority of people did not noticed much change in the summer or winter temperature which may be because of their access to non-agricultural income sources. Also, it was seen that agricultural income and irrigation has significant relationship with the changing climatic factors.

In Namsaling, majority of respondents felt that both summer and winter temperature is rising and also rainfall is decreasing in the area. As factors like education and resources such as landholding have significant F value it shows that they have some relationship with the perception of farmers to change in climatic factors. Further, in Namsaling VDC, respondents have started to notice changes in ripening of fruits, which is normally earlier; new invasion of species in the area that were generally found in the lower altitude and invasion of mosquitoes in higher altitudes.

In both VDCs people have noticed increase in agricultural disease and pests in the area. The farmers in the Namsaling started to see more change in the climatic parameter as they have very limited resources and for most of the agriculture was the major source of income while in case of Chitlang the farmers depended on both the agricultural and non-agricultural income.

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