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Socio-economic analysis of maize seed production in Arghakhanchi district of Nepal

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ABSTRACT

The purpose of this study was to assess the socioeconomic condition of maize seed and non-seed producers. A field survey was carried out in sixty households of Khanchikot VDC of Arghakhanchi district during May, 2014. The district was major seed producing district and Khanchikot was found better in seed production than other VDC in district. Simple random sampling technique was used to collect data using pre-tested interview schedule. About 57% were seed producer among the sample. The average family size of household was 5. Dependency ratio was less in seed producing households (0.41) than non-seed producers (0.72). Farmers were involved in the production of certified seed and the major (50%) source of foundation seed was National Maize Research Program, Rampur, Chitwan. The external input like chemical fertilizer was used in fewer amounts in the study area. The seed test was done at regional laboratory, Bhairahawa and sold to DADO, Arghakhanchi. Decision on loan taking, business operation and bank account were taken by males whereas cropping pattern, deficit labor use, religious and social works related decision were taken by females in the household. Major problem in maize production were lack of technical assistance followed by inadequate irrigation facilities. Proper training, extension service and government support on inputs would help in better socio-economic condition and production of maize.

Keywords: Gender, maize, seed and socio-economic.

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INTRODUCTION

Agriculture that contributes 34.35% in national GDP and consisting of 65.6% of the total population of the country engaged in that sector (AICC, 2014). The share of cereal crop to agriculture is about 61%. Among cereals, maize (*Zea mays* L.) is the main crop in the mid hills of Nepal. It occupies a crucial place than other cereal crops as it is used as food, feed, fodder and other industrial raw material. The total area and production of maize in Nepal is 849,635 ha and

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1999010 t in the year 2012/2013. The present yield level is quite low to fulfill the country's demand; there is a big yield gap of maize in Nepal as affected by various technological and socio-economical factors (KC et al., 2015). Seed is principal factor governing return from almost all agriculture based technological innovations, transfer genetic potentiality to regenerate new crops. The availability of quality seeds in time and suitable to specific location contribute high production to farmers that can helps to reduce pervasive poverty. Crop production can be increased using good quality seeds of high yielding varieties. The conservation of diverse genetic resources, utilization of available resources and effective utilization of experts available in the country are still lacking in Nepal. If utilized properly it can develop niche suitable varieties, their seeds thus increasing investment for seed infrastructure proceeding further for value chain. As a result, Nepalese market is being dominated by global seed business and seed import is rising continuously (MoAD, 2013). Because of increased demand of maize in hilly district, various donor agencies in collaboration with I/NGOs are distributing and contributing maize seeds. This has put an effort to be self-reliant. According to Sulo et al., (2012), discrimination between men and women starts from deep-rooted socio-cultural beliefs and practices. Males are involved in outside job and female spent most of their time in field. Gender inclusion and women participation are much encouraged in the workshops and training conducted regarding nursery development, seed producing, fertilizer treatments, etc. by both private and government sectors (Aregu et al., 2011). The objectives of this study were; to compare socio-economic characteristics of maize seed producers and non-seed producers and also to study the gender role in decision making.

MATERIALS AND METHODS

Study Area

Arghakhanchi district was selected for the study as it was the major seed producing district in the country. In Arghakhanchi, area and production under maize is 16914 ha and 49441 t (ABPSD, 2013). The farmers from Khanchikot VDC were found involving in maize seed production following the recommendations of DADO, Arghakhanchi. So, Khanhikot VDC was selected for the study.

Sampling method and data collection procedure

The Khanchikot VDC is connected to the road corridor. According to Poate and Daplyn (1993), sixty sample size is considered as minimum requirement to generate the appropriate decision making of any region, so total of sixty sample size was collected by using simple random sampling method in May 2014 to represent the district. Simple random sampling technique was used to collect the data, which constitute 34 seed producers and 26 non-seed producers. A pre-tested (10 farmers of Sandhikharka VDC, Arghakhanchi) semi-structured questionnaire was used to collect the necessary data. Focus Group Discussion was carried out to verify the information collected. Key informants such as long term seed producers, technical assistant (Agriculture Service Center), VDC secretary were interviewed to know the seed producing activities in the VDC. The data were entered in Statistical Package of social science (SPSS) software**.** Mean, frequency, percentage, etc. was obtained using descriptive statistical tools. The intensity of problems on maize seed production faced by the farmers was identified

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using six-point scaling techniques: most severe, high severe, medium severe, severe, less severe and scale values were given as 1, (1-1/n), (1-2/n), (1-3/n), (1-4/n) and (1-5/n). From the viewpoint of optimistic nature, the last rank was not provided with the scale zero.

$I = \sum S_i f_i / n$

Where, I = index $0 < I < 1$
S_i = scale value at i^{th} severity
f_i= frequency of the i^{th} severity
n = total number of respondents

RESULTS AND DISCUSSION

Socio-economic description of the study area

The average family size was found 5 which were similar with the national data. The family size was found to be more in seed producing household (5.12) than in non-seed producing HHs (4.88). Higher the population higher the involvement in agricultural works that leads to increased production. The maize production was positively related to family size (Karki, 2004). The study area was found male dominated (71.70%) which was true for both seed producing and non-seed producing households (HHs), i.e. majority of household head were male in the study area. Women mostly involved in performing agricultural tasks i.e. seed production where men are main decision maker. This finding was similar to findings of Bhattarai (2002).The dependency ratio was found less in seed producing households (0.41) in comparison with non-seed producing (0.72) HHs. This indicates that economically active population were more in seed producing HHs than non-seed producing HHs. In case of education, there is no any distinct difference between seed producing and non-producing HHs. In male headed HHs 43.08% had achieved primary level education followed by SLC (27.69%). In female headed HHs 27.69% had achieved primary level education followed by SLC (20%). The level of education affects the selection of variety. Alao, (1971), Atala (1980) and Okwoche, (1998) reported that when the education level of farmers increases, then the adoption of improved maize varieties increases, thus there is direct relationship between them. Agriculture was the major occupation in both cases. The average land holding size in the study area was 15.83 ropani whereas average land holding of seed producers was found greater (20.13 ropani) than non-seed producers (12.54 ropani). About 27.9% HHs in male headed and 23.5% HHs in female headed had received agricultural extension service at HH level. This implies that the extension service was poor in the study area. The less contact with the extension agents the less the adoption rate. The economic condition of farmers can be increased by providing proper training and extension service about the maize seed production technology (Kafle, 2010).

Seed production activities and post-harvest operation

The main source of foundation seed was NARC station from which 50% seed were brought. The average area for seed production was 5.54 ropani. Inputs were supplied equally from agro-vets and local markets. Farm Yard manure (FYM) was applied in bulk amount and chemical fertilizers were less used. Around 58% said that they inspect field themselves and rest inspect their field by DADO technicians. Rouging was practiced by only 29.5% HHs, among

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which male HHHs were found doing more roughing in field. About 78% HHs practiced grading. Removal of tip and bottom was found famous than gravity separator. Seeds were sun dried and send for test at regional lab and then sold to DADO, Arghakhanchi. Minimum amount of seed were sold to farmers and others in the village.

Table 1. Different seed production and post-harvest operation in study area

Description		Gender				Total	
		Male		Female			
		Frequency	%	Frequency	%	Frequency	%
Source of seed	NARC	10	52.63	3	42.85	13	50
	DADO	4	21.05	2	28.57	6	23.08
Area		5.59		5.43		5.54	
Source of input	Agro vet	10	52.6	3	42.86	13	50
	Local market	9	42.4	4	57.14	13	50
Amount of input	Manure (Doko)	265		300		275.29	
	Urea (kg)	14.91		15		14.94	
	DAP(kg)	4.5				4.5	
	MOP (kg)	5				5	
Weeding times		1.23		1		1.17	
Inspection of field	Self	10	52.6	5	71.4	15	57.7
	DADO technician	9	42.4	2	28.6	11	42.3
No of rouging		1.9		1.5		1.8	
Method of grading	Removal of tip and bottom	10	66.66	2	40	12	60
	Gravity separator	5	33.33	3	60	8	40
Seed drying (sun)	Yes	19	100	7	100	26	100
Labelling and Packaging	Yes	10	52.6	3	42.9	13	50
Seed test	No	9	47.4	4	57.1	13	50
Seed sold 9kg)	Yes	19	100	7	100	26	100
Seed sold (Kg)		71.42		74.57		72.27	

Source: Field survey, 2014

Gender empowerment

Technological Innovation if properly understood from the gender perspective can encourage to increase agricultural productivity (Tavya et al., 2013). Rahman (2009) noticed that women play major role in food production and processing. From the study, it was clear that decision of business operation was taken by male and decisions on selection of crop were taken by females or jointly. In seed producers and non producers same result was obtained in the study area. In case of deficit labor use, decisions were taken jointly or by female in the majority of HHs in family. In male headed HHs male have control over financial transactions. Decisions on

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loan taking were taken by both male and female members of the family. In some male HHs it was taken by male, but in female HHHs, all the decision were taken jointly. This could be because loan taking is a big decision in rural family so gender role is equal in this context. There was equal participation of male and female in training and workshops but in female HHHs female participation was more.

Table 2. Role of gender on household level decision making (frequency)

Household decision	Gender	Non Seed producer			Seed producer			Total		
		Male	Female	Both	Male	Female	Both	Male	Female	Both
Business operation	Male	17	1	5	16	1	2	33	2	7
	Female	7	1	2	5	2	0	12	3	2
Selection of crop	Male	8	5	11	3	9	7	11	14	18
	Female	3	5	2	1	5	1	4	10	3
Deficit labour use	Male	3	7	10	3	6	9	6	13	19
	Female	4	4	2	1	4	0	5	8	2
Input purchase	Male	8	5	9	1	5	13	9	10	22
	Female	2	4	4	1	6	0	3	10	4
Product sale	Male	5	4	15	4	7	7	9	11	22
	Female	1	5	4	1	6	0	2	11	4
Loan taking	Male	12	1	9	6	1	11	18	2	20
	Female	3	2	4	0	0	6	3	2	10
Training attending	Male	7	3	8	6	7	5	13	10	13
	Female	1	4	3	0	6	1	1	10	4

Source: Field survey, 2014

Problem ranking

The major problem in maize seed production was identified as lack of technical assistance (86.1%) followed by inadequate irrigation facilities (80.2%), high cost of seed (74.4%), low seed quality (73.3%), low price of agricultural products (72.1%) and lack of machinery (72.1%). Availability of technical assistance and adequate irrigation facilities in an areas assist to adopt maize seed production to increase maize production and income (Rogers, 2003; Hintze et al., 2003). Irrigation is one of the major agricultural inputs for the crop production. Hailu (1992) reported that the lack of agricultural inputs is main bottleneck in maize production and productivity). The low use of quality seeds of high yielding crop varieties ialong with other inputs (e.g. fertilizer, farm machinery) lead into low productivity (Gauchan, 2015). In this present study low price of seed was one of the major problems in commercial seed production. Seed marketing is a important bridge between the seed producers and the farmers who ultimately use the seeds (Sasto, 1969; OMaliko, 1998).

Table 3. Problem of commercial seed production in study area

Problem of Seed production	Frequency	%	Index value	Rank
Lack of technical assistance	74	86.1	0.109	I
Inadequate irrigation facilities	69	80.2	0.102	II
High cost of seed	64	74.4	0.095	III
Low quality seed	63	73.3	0.093	IV

Low price of agricultural product	62	72.1	0.092	V
Lack of machinery	62	72.1	0.092	V

Source: Field Survey 2014

CONCLUSION

Most of the households were headed by males who involved in decision making process on business operation outside the home. Females were found involved in agricultural work i.e. maize seed production. The lack of inadequate irrigation facilities, high cost of seed and low seed quality were major problems. The higher number of females was found involved for input purchase, selection of crops and product sales. They have only primary education; the lack of higher level of education had led to low agricultural production and poor socioeconomic condition. Therefore this study suggested that women empowerment using trainings and educational program would help to increase agricultural production.

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