APPENDICES

Appendix Table 1. Gender participation in crop production activities by ethnic group (Per cent of respondents)

Activities	Magar/Gurung				Brahmin/Chhetri			
	M[1]	F[2]	B[3]	All[4]	M[1]	F[2]	B[3]	All[4]
Ploughing	87	-	-	13*	67	-	-	33
Digging/ clod breaking	4	52	18	26	11	26	41	22
Sowing								
Potato	11	24	30	35	8	21	41	30
Maize	10	17	36	37	11	8	59	22
Millet	1	37	35	27	-	29	49	22
Soybean	1	39	34	26	-	25	53	22
Wheat	-	-	66	34	14	-	57	29
Intercultural operation								
Potato	12	22	33	33	22	16	45	17
Maize	10	20	39	31	37	17	26	20
Millet	6	38	36	20	17	28	31	24
Soybean	4	39	36	21	22	27	37	14
Wheat	30	5	42	23	22	7	47	24
Harvesting								
Potato	2	15	41	42	8	11	51	30
Maize	10	14	33	43	9	15	46	30
Millet	2	32	47	19	5	29	33	33
Soybean	2	37	36	25	3	35	32	30
Wheat	23	20	42	15	20	17	33	30
Drying/ Storage								
Potato	11	21	49	19	17	21	40	22
Maize	21	22	37	20	10	14	46	30
Millet	3	30	29	38	4	30	33	33
Soybean	2	33	28	37	4	21	49	26
Wheat	12	7	49	32	18	4	52	26

n = 118 n = 27

* indicates male and children.

Note: 1= Male, 2= Female
3= Both, 4= All family members

Source: Survey, 1992

Appendix Table 2. Gender participation in crop production activities by economic group (Per cent of respondents)

Activities	Rich M[1]	F[2]	B[3]	All[4]	Medium M[1]	F[2]	B[3]	All[4]	Poor M[1]	F[2]	B[3]	All[4]
Ploughing	100	-	-	-	73	-	-	27	52	-	-	48
Digging/ Clod breaking	6	52	12	30	7	47	13	33	12	36	13	39
Sowing Potato	10	6	58	26	11	16	24	50	13	15	34	38
Maize	-	8	50	42	10	15	30	45	-	15	46	32
Millet	-	10	50	40	-	27	30	43	10	20	36	34
Soybean	5	22	53	20	-	31	32	37	6	32	24	38
Wheat	-	-	60	40	4	-	30	46	7	5	45	43
Intercultural operation Potato	4	14	64	18	7	21	25	47	20	20	54	6
Maize	7	7	86	-	9	22	28	41	22	16	54	6
Millet	2	20	60	18	9	30	24	37	16	20	28	4
Soybean	4	30	50	16	2	38	20	40	16	22	24	6
Wheat	21	-	70	9	4	4	30	62	8	10	42	40
Harvesting Potato	-	20	60	20	-	19	30	51	2	12	70	16
Maize	5	9	50	36	9	19	25	47	22	16	56	6
Millet	5	15	48	32	-	38	20	42	-	28	42	30
Soybean	-	29	71	-	5	36	21	38	-	30	58	12
Wheat	10	9	71	10	6	7	37	50	20	8	38	34
Drying/storage Potato	7	10	69	14	6	22	30	42	-	20	66	12
Maize	8	2	69	21	6	10	38	46	4	20	44	32
Millet	-	15	70	15	5	32	25	38	2	22	40	36
Soybean	-	20	40	40	3	31	23	43	2	30	40	38
Wheat	10	5	45	40	8	6	44	42	6	8	40	46
	n = 14				n = 81				n = 50			

Source: Survey, 1992
Note: 1 = Male, 2 = Female 3 = Both, 4 = All family members

Appendix Table 3. Gender participation in livestock activities by ethnic group

Activities	Magar/Gurung			Brahmin/Chhetri		
	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]
Preparing and feeding *khole*	3	36	61	-	14	86
Feeding water	1	33	66	-	33	67
Feeding thinned maize/ rice straw	2	28	70	3	26	71
Shed cleaning & compost making	1	38	61	3	26	71
Making *ghee, curd* etc	14	21	65	26	26	48
Milking	6	14	80	26	19	55
Disease management	55	3	42	52	22	26
Selling/buying livestock	56	4	40	52	-	48
Selling *ghee, curd*	20	5	75	26	-	74
		n = 118			n = 27	

Source: Survey, 1992

Note: 1 = Male, 2 = Female
3 = Both, 4 = All family members

Appendix Table 4. Gender participation in livestock activities by economic group

Activities	Rich			Medium			Poor		
	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]
Preparing & feeding khole	-	7	93	1	48	51	4	24	72
Feeding water	-	7	93	-	40	60	2	30	68
Feeding thinned maize/rice straw	-	7	93	1	32	67	4	26	70
Shed cleaning & compost making	-	7	93	1	63	36	2	30	68
Making *ghee, curd*	29	-	71	5	32	63	14	12	74
Milking	7	-	93	12	20	68	6	12	82
Disease management	71	-	29	57	6	37	40	2	58
Selling/buying livestock	86	-	14	50	6	44	54	-	46
Selling *ghee,curd*	50	-	50	26	17	57	19	7	74
	n = 14			n = 81			n = 50		

Source: Survey, 1992

Note: 1 = Male, 2 = Female
3 = Both, 4 = All family members

Appendix Table 5. Gender participation in tree growing activities by ethnic group

Activities	Magar/Gurung				Brahmin/Chhetri			
	M[1]	F[2]	B[3]	All[4]	M[1]	F[2]	B[3]	All[4]
Farmland: Buying, searching, carrying & planting of seedlings	47	6	28	19	7	7	56	-
Cutting branches for fodder	17	22	36	25	19	30	37	14
Firewood collection	30	42	20	8	20	30	30	20
Log collection and carrying	51	19	12	18	37	19	26	18
Buying/ selling of logs	70	-	20	10	100	-	-	-
Forest/ Nagiland: Nursery related activities	53	10	17	20	40	10	20	30
Fodder & bedding material collection	13	42	21	24	22	37	22	19
Firewood collection	7	58	20	15	8	48	20	24
Log collection and carrying	23	10	43	24	30	5	40	25
Buying/ selling of logs	34	-	66	-	25	-	50	25
	n = 118				n = 27			

Source: Survey, 1992

Note: 1 = Male, 2 = Female
3 = Both, 4 = All family members

Appendix Table 6. Gender participation in tree growing activities by economic group

Activities	Rich M[1]	Rich F[2]	Rich B[3]	Rich All[4]	Medium M[1]	Medium F[2]	Medium B[3]	Medium All[4]	Poor M[1]	Poor F[2]	Poor B[3]	Poor All[4]
Farmland: Nursery related activities	43	7	50	-	53	22	14	11	52	20	18	10
Cutting branch for fodder	-	7	93	-	12	22	11	55	16	18	40	26
Firewood collection	16	25	46	13	14	24	43	19	16	20	45	19
Log collection & carrying	43	7	50	-	57	15	14	14	48	14	30	8
Buying/selling of logs	93	-	7	-	32	-	68	-	38	-	62	-
Forest/ Nagiland: Nursery related activities	71	7	22	-	43	12	6	39	38	12	8	42
Fodder and bedding material collection	14	50	36	-	25	56	10	19	16	20	38	26
Firewood collection	14	57	29	-	3	77	11	9	14	24	38	24
Buying/selling of logs	100	-	-	-	49	-	51	-	46	-	54	-
	n = 14				n = 81				n = 50			

Source: Survey, 1992

Note: 1 = Male, 2 = Female
3 = Both, 4= All family members

Appendix Table 7. Gender related decision making processes concerning crop production by ethnic group

Decisions to be made	Per cent of respondents								
	Magar/ Gurung			Brahmin/ Chhetri			Total		
	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]
What crop to plant & how much land to be allocated for crop?	35	16	49	52	11	37	38	15	47
Which variety?	38	13	49	59	-	41	42	10	48
When to sow seeds?	32	17	51	56	7	37	37	15	48
How much compost to be used?	34	21	45	48	11	41	37	19	44
When to weed crop?	26	22	52	48	7	45	30	19	51
Plant protection	45	8	47	37	-	63	43	6	51
When to harvest and who will harvest?	32	14	54	52	-	48	36	12	52
How and where to store products?	35	17	48	40	11	45	36	16	48
Amount of grain to be consumed	33	20	47	48	11	41	36	17	47
Selling of grains: Where to sell?	39	15	46	52	4	44	41	13	28
Buying of grains: Where to buy?	47	13	40	52	7	41	49	12	39
Mean	36	16	48	49	8	43	39	14	47
	n = 118			n = 27			n = 145		

Source: Survey, 1992

Note: 1 = Male, 2 = Female
3 = Both, 4= All family members

Appendix Table 8. Gender related decision making processes concerning crop production by economic group

Decisions to be made	Per cent of respondents								
	Rich			Medium			Poor		
	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]
What crop to plant & how much land to be allocated for crop?	64	-	36	28	16	56	46	22	32
Which variety?	64	-	36	35	10	64	48	14	38
When to sow seeds?	57	7	36	31	15	54	40	18	42
How much compost to be used?	64	-	36	28	21	51	42	22	36
When to weed crop?	57	7	36	21	23	56	38	20	42
Plant protection	86	-	14	46	7	47	28	10	62
When to harvest and who will harvest?	50	-	50	27	15	58	46	14	40
How and where to store products?	36	-	64	28	14	58	52	24	24
Amount of grain to be consumed	43	-	57	28	8	64	50	24	26
Selling of grains: Where to sell?	43	-	57	35	14	51	50	16	34
Buying of grains: Where to buy?	43	-	57	38	14	48	64	14	22
Mean	55	7	38	31	14	55	46	18	36
	n = 14			n = 81			n = 50		

Source: Survey, 1992

Note: 1 = Male, 2 = Female
3 = Both, 4 = All family members

Appendix Table 9. Gender related decision making processes concerning livestock production by ethnic group

Decisions to be made	Decision maker (No. of respondent)								
	Magar/ Gurung			Brahmin/ Chhetri			Total		
	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]
Type of livestock to be kept	42	12	46	44	8	48	42	12	46
No. of livestock to be raised	40	12	48	44	8	48	41	11	48
Selection of breed	42	12	46	56	3	41	44	10	46
Where to make shed?	64	9	27	59	-	41	63	9	28
When and where to collect fodder?	36	25	39	48	11	41	38	25	37
Feeding management in fodder unavailability season	36	17	47	48	8	44	37	18	45
When and where to sell livestock?	43	12	45	59	-	41	46	11	43
When and in how much to buy livestock?	51	10	39	59	-	41	52	10	38
Amount of livestock to be consumed	36	15	49	59	-	41	42	12	46
Amount of livestock product to be sold	43	15	42	59	-	41	46	12	42
Mean	43	14	43	49	8	43	45	13	42
	n = 118			n = 27			n = 145		

Source: Survey, 1992

Note: 1 = Male, 2 = Female
3 = Both, 4 = All family members

Appendix Table 10. Gender related decision making concerning livestock production by economic group

Decisions to be made	Decision maker (No. of respondent)								
	Rich			Medium			Poor		
	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]
Type of livestock to be kept	43	7	50	35	9	56	54	16	30
No. of livestock to be raised	50	-	50	33	10	57	50	16	34
Selection of breed	57	-	43	38	10	52	50	14	36
Where to make shed?	70	-	30	63	9	28	58	12	30
Who and where to collect fodder?	64	-	36	35	27	38	36	24	40
Feeding management in fodder unavailability season	50	7	43	36	16	48	40	20	40
When and where to sell livestock?	50	7	43	41	10	49	54	14	32
When and in how much to buy livestock?	65	-	35	47	9	44	58	14	28
Amount of livestock to be consumed	57	-	43	31	15	54	52	16	32
Amount of livestock product to be sold	57	-	43	38	14	48	56	32	26
Mean	56	7	37	40	13	47	50	18	32
	n = 14			n = 81			n = 50		

Source: Survey, 1992

Note: 1 = Male, 2 = Female
3 = Both, 4 = All family members

Appendix Table 11. Gender related decision making processes concerning tree management by ethnic group

Decisions to be made	Decision maker (No. of respondent)								
	Magar/ Gurung			Brahmin/ Chhetri			Total		
	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]
Where and when to plant trees?	65	9	26	59	7	34	64	9	27
From where to get seedlings?	19	10	71	60	3	37	61	9	70
What tree species to be planted?	64	8	28	63	-	37	64	7	29
When to cut trees for timber?	72	8	20	63	-	37	71	7	22
When to cut leaves, branches for fuelwood?	50	23	27	52	11	37	50	21	29
Where and in how much to sell timber?	77	5	18	70	-	30	76	4	20
Mean	58	11	32	61	7	35	64	10	33
	n = 118			n = 27			n = 145		

Source: Survey, 1992

Note: 1 = Male, 2 = Female
3 = Both, 4 = All family members

Appendix Table 12. Gender related decision making processes concerning tree management by economic group

Decisions to be made	Decision maker (No. of respondent)								
	Rich			Medium			Poor		
	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]
Where and when to plant trees?	71	-	29	62	6	32	66	16	18
From where to get seedlings?	64	-	36	62	7	31	60	14	26
Which tree species to be planted?	71	-	29	62	5	33	66	12	22
When to cut trees for timber?	71	-	29	70	4	26	70	14	16
When to cut leaves, branches for fuelwood?	64	15	21	48	17	35	50	28	22
Where and in how much to sell timber?	79	-	29	73	4	23	80	6	14
Mean	70	15	29	63	7	30	65	15	20
	n = 14			n = 81			n = 50		

Source: Survey, 1992

Note: 1 = Male, 2 = Female
3 = Both, 4 = All family members

Appendix Table 13. Gender related decision making processes concerning household and other activities by ethnic group

Decisions to be made	Decision maker (No. of respondent)								
	Magar/ Gurung			Brahmin/Chhetri			Total		
	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]
When and where to buy necessary household materials?	36	16	48	63	-	37	41	13	46
When to buy/ sell house/ land?	54	9	37	66	-	34	57	8	35
Where to buy land/ houses?	60	10	30	69	-	31	62	8	30
How much to be spent for buying household materials?	36	25	39	48	18	34	32	23	45
Sending children to school	36	12	52	55	-	45	40	9	51
Participation in village meetings	65	13	22	74	-	26	67	10	23
Participation in training activities	69	10	21	78	-	22	71	8	21
Mean	51	14	36	65	18	33	53	11	36
	n = 118			n = 27			n = 145		

Source: Survey, 1992

Note: 1 = Male, 2= Female
3 = Both, 4= All family members

Appendix Table 14. Gender related decision making processes concerning household and other activities by economic group

Decisions to be made	Decision maker (No. of respondent)								
	Rich			Medium			Poor		
	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]	M[1]	F[2]	B[3]
When and where to buy necessary household materials?	29	7	64	27	14	59	68	14	18
When to buy/ sell land/ house?	50	-	50	48	5	47	72	14	14
Where to buy land/ house?	50	-	50	62	5	33	70	16	14
How much to be spent for buying household materials?	36	7	57	32	21	47	54	32	14
Sending children to school	36	7	57	33	10	57	50	16	34
Participation in village meetings	29	14	57	67	10	23	76	16	8
Participation in training activities	29	7	64	69	10	21	84	12	4
Mean	32	8	57	48	11	41	68	17	15
	n =14			n = 81			n = 50		

Source: Survey, 1992

Note: 1 = Male, 2 = Female
3 = Both, 4 = All family members

Appendix Table 15. Variables considered during the survey

a) Pre- diagnostic description and PRA

Biophysical

1. Different crops and cropping patterns.
2. Crop calender and farming activities.
3. Livestock population and fodder management practices.
4. Information about soil erosion and its traditional management practices.

Tree Management system

1. Uses of indigenous and Project's introduced tree species.
2. Natural distribution and regeneration of those tree species.
3. Existing fuel, fodder and timber species on farmland.
4. Problems of fodder, fuelwood and timber trees.
5. Tree nursery- knowledge of location, what it provides.

Land use

1. Land use patterns: Agricultural land- lowlands and uplands.
   Forest land and community based land.
2. Land holding sizes and available farm trees.

Socioeconomic

1. Population and family sizes.
2. Cultural and social acceptances to grow fuel and fodder tree species on agricultural land.
3. Farmers' preferences for different farm trees.

Gender issue

1. Male and female farmers' participation in different agroforestry activities.
2. Participation of male and female farmers in different household activities.
3. Participation and attitude of male and female farmers in private tree planting on their farmland.

b) Formal Survey

- Farm size, household size and land holding size.
- Farmers' preferences for farm trees.
- Uses of different trees.
- Needs of farmers (like certain multipurpose trees).
- Cropping systems.
- Activities performed by male and female farmers.
- Time alloted by male and female farmers on different forestry and household activities.

Appendix Table 16 Scientific name of tree species

Local name	Scientific name
Bains	*Salix babylonica*
Bans	*Bambusa sp.*
Dudhilo	*Ficus nerifolia*
Dhupi	*Juniperus sp.*
Falant	*Quercus glauca*
Gogan	*Saurauia napaulensis*
Ghurmiso	*Leucosceptrum canum*
Katus	*Castanopsis hystrix*
Khanyu	*Ficus cunia*
Nevaro	*Ficus roxburghii*
Okhar	*Juglans regia*
Painyu	*Prunus cerasoides*
Salla	*Pinus wallichiana*
Utis	*Alnus nepalensis*

Formula for "t" and "Chi square" tests

t-test

$$T = Y_1 - Y_2 / S\,(1/n_1 + 1/n_2)^{1/2}$$

Where, T is calculated t-value; Y1 and Y2 are two population means; S is standard deviation; n_1 and n_2 are number of observations.

S is calculated as follows,

$$S = (n_1 - 1)\,s_1^2 + (n_2 - 1)\,s_2^2 / (n_1 + n_2 - 2)$$

Where, s_1^2 and s_2^2 are standard deviation for two different populations.

$$s = \frac{1}{n} \sum_{I=1}^{n} (Y_i - Y)^2 \qquad Y = \frac{1}{n} \sum_{i=1}^{n} Y_i$$

Hypotheses :

Ho : $(\mu_1 - \mu_2) = 0$

Ha : $(\mu_1 - \mu_2) > 0$

Rejection region : $T > T\alpha$ ($T\alpha$ is table value)
For specified α. Where α is confidence level.
(generally 0.05)

Chi square test

$$\chi^2 = \Sigma \frac{(O - E)^2}{E}$$

where O and E are observed and expected values respectively.

v (degree of freedom) = (r-1)(c-1)
where 'r' and 'c' are number of rows and columns respectively.

Rejection of hypothesis if $\chi^2 > \chi^2_{0.05}$
i.e. calculated > Table

References :

1. Statistical Methods. Dr. S.P. Gupta. New Delhi : Sultan Chard and Sons. 1982.
2. Mathematical Statistics with applications. William Mendenhall and Richard. L. Scheaffer. North Scituate, Massachusetts : Duxubury press. 1973.

CURRICULUM VITAE

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Educational background

1993	M.S. Agricultural Systems, Chiang Mai University, Thailand
1989	B. Sc. Agriculture, Haryana Agricultural University, India

Fellowships and grants

1991-1993	Winrock International Fellowship
1985-1989	U.S.AID Fellowship

Work experience

1989-1991	Asst. Agronomist Pakhribas Agricultural Centre, Dhankuta, Nepal
1991	Volunteer R- Lab, Sanepa, Nepal