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What is the role of female labour in Sikkim farming sector?

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Ph.D. Defense Seminar on

**What is the role of female labour in Sikkim
farming sector?**

Presented by

Nidhi Dwivedy

Organization of the Presentation

Introduction

Literature Survey and Study Gap

Methodology

Findings /Discussions

**Conclusion , Recommendations and Future Scope
of Study**

Acknowledgement

References

Introduction

Introduction

❖ Background

Structure of the Thesis

❖ Location and Characteristics of the Study Area

Indian Himalayan Region (IHR)

Topography/ Geomorphology of Sikkim

Geography of Sikkim

Zonation of Sikkim

Demographic Features

General about Sikkim

Panchayati Raj Institutions (PRI)

Introduction Contd...

❖ Status of Women

Historical background of the status of women

Constitutional status of women

Gender equality

Need of gender-disaggregated data in agriculture

❖ Female Labour in Agriculture Sector

Concept of labour

Role of female labour

Characteristics of agriculture labour

Worker's profile in Sikkim

Women in agriculture

Women in Sikkim agriculture

❖ The Research Question

Research Question

The Research Question

What is the present contribution and status of women in the farming sector in the state of Sikkim?

**Literature Survey
&
the Study Gap**

Literature survey

Sub-divided into the five categories:

- Gender wise participation/ownership in farm/animal activities (References -68)
- Females in decision making in farming (References -17)
- Access of women to production resources in farming (References -40)
- Agriculture & it's allied sector (References -19)
- Challenges faced by women (References -21)
- Conclusion
- Research Gap

Literature survey Contd...

Research Gap

1. **Social science research in the state of Sikkim is inadequate**
2. **Availability of unreliable data of the North Eastern region before the launching of economic journal named “NEDFi Databank Quarterly” on July 2002**

Methodology

Methodology

Problem Definition

To study the present contribution and status of women in the farming sector in the state of Sikkim

Objectives of the Study

To assess →

- (a) Land/cattle possession and their ownership by the Sikkimese female farmers
- (b) Decision making rights
- (c) Employment intensity (Number of hours worked/day)
- (d) Accessibility to production resources
- (e) The gender participation in crop production and it's related activities
- (f) Their views on farming/family and integrated farming
- (g) Their indigenous knowledge
- (h) Tangible and intangible contribution they are making to the State

Methodology Contd...

Scope of the study

The study has covered

Land/cattle possession and ownership status of Sikkimese female farmers

Decision making rights

Employment intensity (Number of hours/day)

Access to production resources and inputs

Participation in crop production and it's related activities

Their views on farming/ family and integrated farming

Methodology Contd...

Nature of the study

Empirical

Conclusive

Research Design:

Exploratory

Descriptive

Methodology Contd...

❖ Delimitations of the study

Married female farmers of rural areas not participating in farm/animal activities and the male farmers are excluded from the study

The Hypotheses

Women function in farms with considerable restrictions/limitations

❖ Universe or Population

Comprises of married female farmers of rural area of the state of Sikkim

Methodology Contd...

Sample Frame

Population:

Married female farmers of rural areas of Sikkim

Location:

East, West, North and South districts of the Sikkim

Activities:

Management and participation of female farmers in farm and it's related activities

Tools of the Study:

Statistical methods used for studying and analyzing the participation characteristics of female farmers

	Circles		Revenue Blocks	
	Total	Sample	Total	Sample
East	21	06	40	15
West	21	06	32	11
North	07	04	30	05
South	23	08	45	15
Sikkim				46

Methodology Contd...

Sampling Method

Circles & revenue blocks

Multi-stage stratified random sampling technique

Villages
Judgemental sampling

Respondents

stratified random sampling method

District/ State	Total area (sq. km)	% of total area	Population Concentration	% of total Population	No. of female sample farmers
East	954	13.5	2,45,040	45.3	80
West	1,166	16.5	1,23,256	22.8	60
North	4,226	59.5	41,030	07.6	30
South	750	10.5	1,31,525	24.3	60
Sikkim	7,096	100	5,40,851	100	230

Source- census 2001.

❖ Sample Size: 230

Methodology Contd...

Research Instrument for Primary Data

No. of Questions – 80

Questions are dichotomous, multiple choice and open end

Translated into Nepali also for the convenience of the farm population

Methodology Contd...

**Access &
Decision making**

Data Analysis

Five-point discrete rating

Factor analysis
(Kaiser-Meyer-Olkin measure of
sample adequacy & Bartlett's test of
sphericity)

Ordinal scale

One-sample 't'-test

95% confidence interval

Poor	1
Rare	2
Sometimes	3
Frequent	4
Always	5

Methodology Contd...

Data Analysis

participation in farm activities,

ownership of livestock & land,

credit status, education, membership status

home responsibility status

Nominal scale

One-sample 't'-test

95% confidence interval

Employment intensity

Paired t-test

Methodology Contd...

Data Analysis

Female farmer's views
pertaining to the
questions having direct
bearing with the topic

Ordinal scale
One-sample 't'-test
95% confidence
interval

Ten-point discrete rating scale

Strongly
Negative

1

2

3

4

5

6

7

8

9

Strongly
Positive

10

Need of the study

To highlight the invisible contribution of female farmers so that it gets counted

To provide a basis for overcoming gender discrimination

To consolidate social science information in the state of Sikkim

For better understanding of policy implications of women empowerment

Result analysis and findings

Livestock ownership of female farmers

❖ Livestock ownership of female farmers:

Hypothesis Statement – There is discrimination in ownership of livestock by women.

Ho -Ownership of livestock by women is not more than that of men.

The Result

Livestock ownership	Figures in %		
	Male	Both	Female
Cow	46	39	15
Bullocks	100	0	0
Pigs	66	23	11
Goat	17	57	26
Poultry	12	20	73

Livestock ownership of female farmers Contd...

Table-4.2.1.8-One-sample test							Accept/ Reject null hypothesis	Conclusion
Test value = 2								
			95% confidence interval					
	t	Sig. (2-tailed)	Mean Diff	Mean	Lower	Upper		
Q1.1 A1	-6.492	.000	-.309	1.69	-.40	-.22	Accepted	Discriminatio n
Q1.1 B1	-66.042	.000	-1.787	.21	-1.84	-1.73	Accepted	-Do-
Q1.1 C1	-21.745	.000	-1.257	.74	-1.37	-1.14	Accepted	-Do-
Q1.1 D1	-12.830	.000	-.970	1.03	-1.12	-.82	Accepted	-Do-
Q1.1 E1	1.599	.111	.126	2.13	-.03	.28	Rejected	No Discriminatio n

Cow (A1), Bullock (B1), Pig (C1), Goat (D1), Poultry (E1)

Land status

❖ Gender wise ownership of land

Hypothesis Statement – There is discrimination in ownership of land by women.

Ho – Ownership of land by women is not more than that of men.

❖ Possession of farms sizes with women

Hypothesis Statement – No more female farmers of rural area possess large landholdings.

Ho – Possession of large landholdings by women is not more than that of smaller one.

❖ Type of category of female farmers

Hypothesis Statement – More no. of female cultivators rather than agriculture labours are there.

Ho- Female cultivators are not more than agriculture labours.

Land status Contd...

The result

The study has following inferences –

Land ownership (%)		
Male	Both	Female
52	41	07

Type of land possession (%)		
Small	Medium	Large
64	28	08

Type of category (%)	
Agriculture Labours	Cultivators
10	90

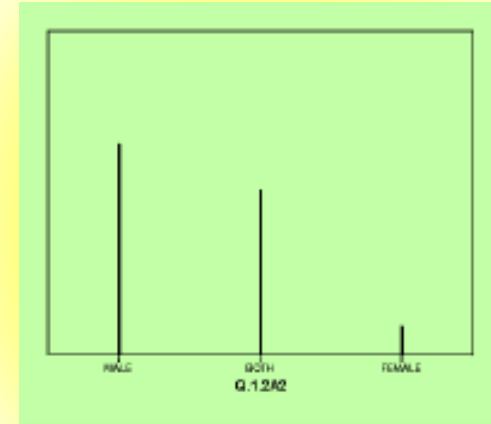
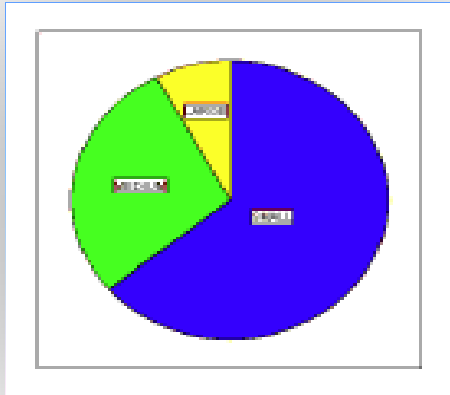
Land status Contd...

t-test of inferential analysis

One-sample test							Accept/ Reject null hypothesis	Conclusion
Test value = 2								
	t	Sig. (2-tailed)	Mean Diff	Mean	95% confidence interval			
					Lower	Upper		
Ownership of land	-11.002	.000	-.452	1.55	-.53	-.37	Accepted	Discrimination
Possession of land	-13.373	.000	-.561	1.44	-.64	-.48	Accepted	No more large land
Female Category	20.177	.000	.400	1.90	.36	.44	Rejected	More cultivators

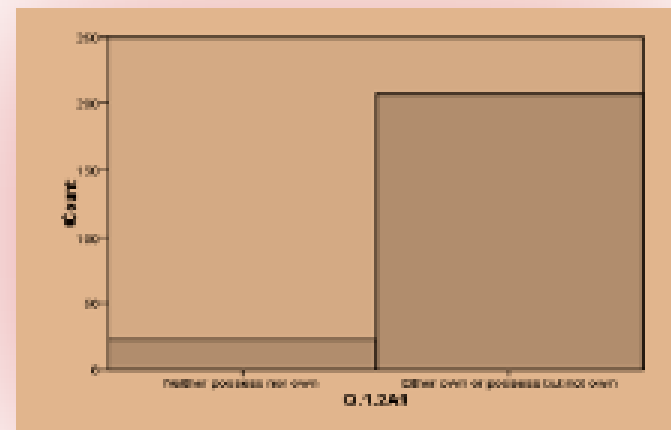
Land status

❖ Gender Wise Ownership of Land



Female Farmer's Land Possession

❖ Female Farmer's Category



Decision making by women in farm activities

❖ **Hypothesis Statement** – Female farmers are not consulted for decision making in farm activities.

Ho – Decision making by female farmers is not more in farm activities.

The result

The study has following inferences

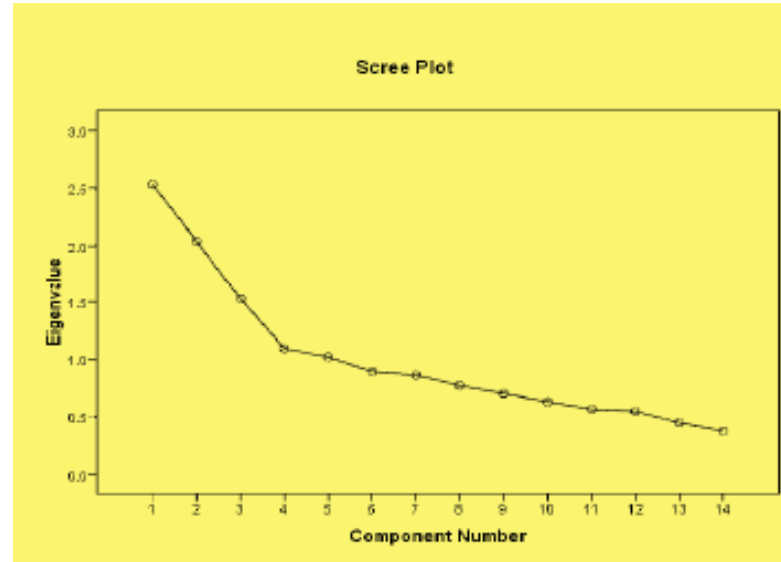
Decision making by women in farm activities Contd...

Table-4.2.3.3 - One-sample test							Accept/ Reject null hypo thesis	Conclusio n
Test value = 3								
					95% confidence interval			
Decision making of Farm/related activities	t	Sig.2- tailed	Mean Diff	Mean	Lower	Upper		
selection of crops of the season to be sown	11.256	.000	.883	3.88	.73	1.04	Reject	More decision
selection of harvesting time	8.970	.000	.730	3.73	.57	.89	Reject	-do-
changing of crops	4.193	.000	.296	3.30	.16	.43	Reject	-do-
purchase of agricultural equipment	-2.529	.012	-.174	2.83	-.31	-.04	Accept	Less decision
procurement of fertilizer	- 12.728	.000	-.904	2.10	-1.04	-.76	Accept	-do-
selection and procurement of seeds of new variety	-2.092	.038	-.148	2.85	-.29	.00	Accept	-do-
selling of crops/cereals/ vegetables	.059	.953	.004	3.00	-.14	.15	Reject	More decision

Decision making by women in farm activities Contd...

Table-4.2.3.3 - One-sample test							Accept/ Reject null hypo thesis	Conclusio n
Test value = 3								
				95% confidence interval				
Decision making of Farm/related activities	t	Sig.2- tailed	Mean Diff	Mean	Lower	Upper		
purchasing/selling of livestock	-7.576	.000	-.543	2.46	-.68	-.40	Accept	Less decision
selection of breed of animals	-10.123	.000	-.796	2.20	-.95	-.64	Accept	-do-
storage of green fodder for lean period	-1.673	.096	-.152	2.85	-.33	.03	Accept	-do-
selling of surplus dry fodder	-46.768	.000	-1.726	1.27	-1.80	-1.65	Accept	-do-
procurement of dry fodder from the market	-25.698	.000	-1.357	1.64	-1.46	-1.25	Accept	-do-
selling of green fodder in the market	-36.970	.000	-1.591	1.41	-1.68	-1.51	Accept	-do-
selling of milk/poultry items	4.822	.000	.391	3.39	.23	.55	Reject	More decision

Decision making by women in farm activities



Scree plot of accessibility to production resources

❖ Eigen more than 1

selection of crops of the season to be sown, selection of harvesting time, selling of milk/poultry items, selling of crops/cereals/ vegetables and changing of crops

Female farmer's participation in farms

❖ Gender Wise Participation

- **Hypothesis Statement** – Female farmer's participation in farm activities is more than that of men.

Ho –Female farmer's participation in farm activities is not more than that of men.

The result

The study has following inferences –

Female farmer's participation in farms Contd...

Table-4.2.4.3-One-sample test							Accept / Reject null hypo thesis	Conclusion
Test value = 2								
				95% confidence interval				
Farm activities	t	Sig. 2-tailed	Mean Diff	Mean	Lower	Upper		
Ploughing of Fields	-24.371	.000	-.722	1.28	-.78	-.66	Accept	Less Participation
Sowing of seeds	10.740	.000	.374	2.37	.31	.44	Reject	more Participation
Weeding	4.510	.000	.183	2.18	.10	.26	Reject	-do-
Harvesting	7.270	.000	.252	2.25	.18	.32	Reject	-do-
Threshing	.213	.832	.009	2.01	-.07	.09	Reject	-do-
Winnowing	.749	.455	.035	2.03	-.06	.13	Reject	-do-
Storage of grains	-2.781	.006	-.117	1.88	-.20	-.03	Accept	Less Participation
Collection of fuel from fields	-2.749	.006	-.113	1.89	-.19	-.03	Accept	-do-
Procurement of feed	-4.876	.000	-.213	1.79	-.30	-.13	Accept	-do-
Cleaning of animals shed	-5.534	.000	-.200	1.80	-.27	-.13	Accept	-do-

Female farmer's participation in farms Contd...

Table-4.2.4.3-One-sample test							Accept/ Reject null hypo thesis	Conclusion
Test value = 2								
					95% confidence interval			
Farm activities	t	Sig. (2- tailed)	Mean Diff	Mean	Lower	Upper		
Feeding of animals	4.363	.000	.139	2.14	.08	.20	Reject	more Participation
Watering	4.766	.000	.178	2.18	.10	.25	Reject	-do-
getting green fodder from fields	-.097	.923	-.004	2.00	-.09	.08	Accept	less Participation
Milking	2.542	.012	.109	2.11	.02	.19	Reject	more Participation
Milk disposal	5.878	.000	.243	2.24	.16	.33	Reject	-do-
Traditional health care to animals	-6.771	.000	-.291	1.71	-.38	-.21	Accept	less Participation
Vaccination/visits to animal hospitals	-23.854	.000	-.713	1.29	-.77	-.65	Accept	-do-
Breeding of animals	-21.547	.000	-.678	1.32	-.74	-.62	Accept	-do-
Traditional care of fields/crops	-2.638	.009	-.091	1.91	-.16	-.02	Accept	-do-

Female farmer's participation in farms Contd...

❖ Employment intensity

Hypothesis Statement – Female farmers work for more time than men in farm activities.

The result

The study has following inferences –

Female farmer's participation in farms Contd...

❖ Paired-samples test of inferential analysis

Table-4.4.2.3(i)-Paired-samples test								
	Paired differences					t	df	Sig. (2-tailed)
	Mean	Std. deviation	Std. error mean	confidence interval				
				Lower	Upper			
Q4A-4B	-.378	1.402	.092	-.560	-.196	-4.092	229	.000

Accessibility of farming females to productive resources

❖ **Hypothesis Statement** – There is discrimination in accessibility of rural female farmers to productive resources.

Ho - Accessibility of rural female farmers is not more to productive resources.

The result

The study has following inferences–

Accessibility of farming females Contd...

Table-4.2.5.3 - One-sample test							Accept/ Reject null hypo thesis	Conclusio n
	Test value = 3				95% confidence interval			
Production resources	t	Sig. (2- tailed)	Mean Diff	Mean	Lower	Upper		
Production inputs	-2.065	.040	-.143	2.86	-.28	.00	Accept	Access is less
Credit	-11.902	.000	-1.030	1.97	-1.20	-.86	Accept	-Do-
Extension service and training	-8.266	.000	-.557	2.44	-.69	-.42	Accept	-Do-
Technology & govt. policies	-8.312	.000	-.448	2.55	-.55	-.34	Accept	-Do-
Education	-9.781	.000	-.652	2.35	-.78	-.52	Accept	-Do-
Rural institution	-19.570	.000	-1.183	1.82	-1.30	-1.06	Accept	-Do-
Livestock rearing	7.679	.000	.391	3.39	.29	.49	Reject	Access is more

Accessibility of farming females Contd...

The study has following inferences based on mean score –

No (Poor)–

None

Rare (Limited)–

Extension services & training, Education, Credit, rural institutions

Sometimes (Good)–

Production inputs, Technology/Govt. policies

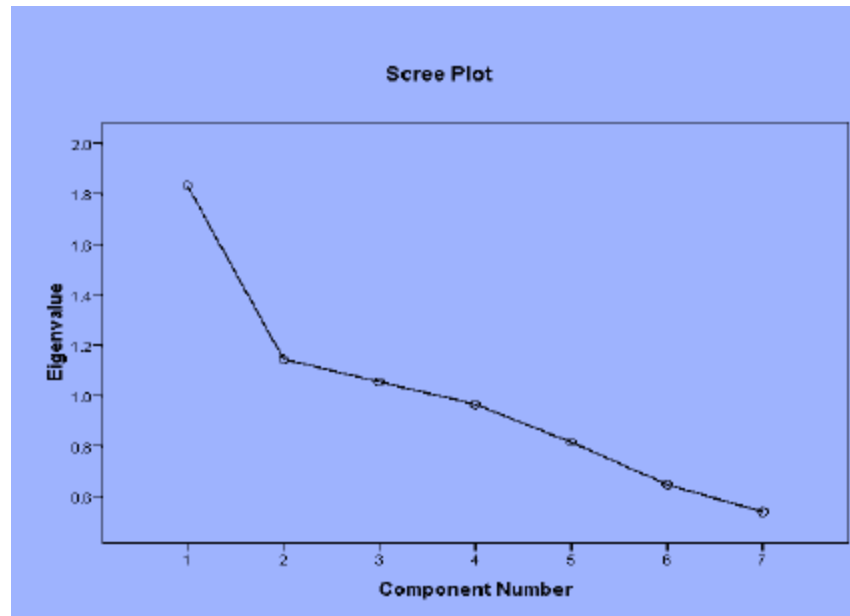
Frequent (Better)-

livestock rearing

Always (Best) -

None.

Accessibility of farming females to productive resources



Scree plot of accessibility to production resources

❖ Eigen more than 1

livestock rearing, production inputs, technology & govt. policies

Accessibility of farming females to production inputs

❖ **Hypothesis Statement** – There is discrimination in accessibility of rural female farmers to production inputs.

Ho - Accessibility of rural female farmers is not more to production inputs.

The result

The study has following inferences—

Accessibility of farming females to inputs Contd...

The study has following inferences—

Table-4.2.5.6- One-sample test							Accept/ Reject null hypo thesis	Conclusion
	Test value = 3			95% confidence interval				
Production inputs	t	Sig. (2-tailed)	Mean Diff	Mean	Lower	Upper		
Seeds and saplings	-2.167	.031	-.152	2.85	-.29	-.01	Accept	Access is less
Water sources- dhara	49.881	.000	1.609	4.61	1.55	1.67	Reject	Access is more
Medicine for plants	-4.876	.000	-.309	2.69	-.43	-.18	Accept	Access is less
Medicine for animals	-16.315	.000	-1.135	1.87	-1.27	-1.00	Accept	-Do-
Fertilizers	-12.583	.000	-.891	2.11	-1.03	-.75	Accept	-Do-

(Credit status)

❖ **Hypothesis Statement** – Credit status of rural female farmers is not as good as that of men.

Ho – No more number of rural female farmers avail credit on their name.

Ho – No more rural female farmers use formal institution to avail credit .

Ho - Credit is not used for commercial purpose by rural female farmers.

Credit status Contd...

Credit status (%)			
	Don't avail		Avail
Credit availing status	22		78
	Male	Both	Female
Credit availing head	56	10	34
	Formal	Both	Informal
Credit availing institution	43	12	45
	Personal	Both	Commercial
Credit availing purpose	30	15	55

Credit status Contd...

One-sample test							Accept/ Reject null hypo thesis	Conclusion
	Test value=1.5							
					95% confidence interval			
Credit availing	t	Sig. (2-tailed)	Mean Diff	Mean	Lower	Upper		
Status	10.136	.000	.278	1.78	.22	.33	Reject	Avail
Head	-1.554	.121	-.113	1.39	-.26	.03	Accept	Male
Institution	.839	.403	.065	1.57	-.09	.22	Accept	Informal
Purpose	3.078	.002	.248	1.75	.09	.41	Reject	Commercial

Awareness regarding technology & govt. policies

❖ **Hypothesis Statement** – More rural female farmers are not aware regarding Technology & Govt. policies.

Ho – Awareness regarding technology & govt. policies is not more of rural female farmers.

The result

The study has following inferences –

Awareness regarding technology & govt. policies (%)		
	Not aware	Aware
Technology	24	76
Govt. policies	17	83

Awareness Contd...

t-test of inferential analysis

Table-4.5.5.18-One-sample test							Accept/ Reject null hypothesi s	Conclusion
Test value = 1.5								
					95% confidence interval			
	t	Sig. (2-tailed)	Mean Diff	Mean	Lower	Upper		
Technology	8.839	.000	.252	1.75	.20	.31	Reject	More are aware
Govt. Policies	13.019	.000	.326	1.83	.28	.38	Reject	-Do-

Membership of any institution

- Assumption is that no more female farmers are the members.

The result

The study has following inferences based on mean score –

	Don't (%)	Yes (%)
Members of any formal/informal institution	50	50

Education level

❖ **Hypothesis Statement** – Female farmer's education level is not more

Ho – Female farmer's education level is not more

The result

The study has following inferences –

Extent of Access to Education

Illiterate – 21%

Primary – 39%

Middle – 29%

Matric – 08%

Secondary - 03%

Education level Contd...

t-test of inferential analysis

Table-4.2.5.22- One-sample test							Accept/ Reject null hypothesis	Conclusion
Test value = 3								
					95% confidence interval			
	t	Sig. (2-tailed)	Mean Diff	Mean	Lower	Upper		
Education level	-9.781	.000	-.652	2.35	-.78	-.52	Accept	It is less

Age wise frequency of females

Table-4.2.5.27-Age					
	Category of age	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-39	126	54.8	54.8	54.8
	40-59	95	41.3	41.3	96.1
	60 and above	9	3.9	3.9	100.0
	Total	230	100.0	100.0	

Views on farming/ family roles

❖ **Hypothesis Statement** – More rural female farmers feel positively for their participation in farming/ family roles.

Ho –no more number of female farmers feel positively for their respective participation in farming/ family roles.

The result

The study has following inferences –

Views on farming/ family roles Contd...

t-test of inferential analysis

Table-4.6.2-One-sample test							Accept/ Reject null hypothe sis	Conclusion
Test value = 5								
	t	Sig. (2- tailed)	Mean Diff	Mean	95% confidence interval			
					Lower	Upper		
Female's views								
Doing anything except agriculture (A)	15.92 3	.000	2.574	7.57	2.26	2.89	Reject	Want to do
Feeling for leaving farming (B)	3.185	.002	.626	5.63	.24	1.01	Reject	Feel to leave
Feeling for their contribution in farming (C)	13.29 7	.000	2.161	7.16	1.84	2.48	Reject	Proud feeling
Moving towards urban area (D)	-6.633	.000	-.935	4.07	-1.21	-.66	Accept	Do not want to move
Accompanying their husbands in case they move towards urban area (E)	-.444	.658	-.091	4.91	-.50	.31	Accept	Do not want to
Absorb their sons in agriculture (F)	-6.646	.000	-1.248	3.75	-1.62	-.88	Accept	-do-
Absorb their daughters in agriculture (F2)	-8.644	.000	-1.548	3.45	-1.90	-1.19	Accept	-do-
Looking after the responsibility at home as well as in agriculture (G)	13.77 5	.000	2.183	7.18	1.87	2.49	Reject	Feel happy

Views on farming/ family roles Contd...

t-test of inferential analysis

Table-4.6.2-One-sample test							Accept/ Reject null hypothesis	Conclusio n
Female's views	Test value = 5							
	t	Sig. (2- tailed)	Mean Diff	Mean	95% confidence interval			
					Lower	Upper		
Opting for entrepreneurial activity (H)	22.903	.000	3.117	8.12	2.85	3.39	Reject	Want to do
Knowledge about plant disease and their prevention (I)	-43.347	.000	-3.235	1.77	-3.38	-3.09	Accept	Possess Knowledge
Knowledge about animal disease and their prevention (J)	-46.009	.000	-3.257	1.74	-3.40	-3.12	Accept	-do-
Knowledge about feeding/nursing of domestic animals (K)	-39.031	.000	-3.113	1.89	-3.27	-2.96	Accept	-do-
Feeling about owning animal/property (L)	13.046	.000	2.374	7.37	2.02	2.73	Reject	Feel positive
Handing over the property to their daughter-in-law (M)	-6.748	.000	-1.248	3.75	-1.61	-.88	Accept	Negative view
Feeling about the income they get from their farm (N)	-4.702	.000	-.535	4.47	-.76	-.31	Accept	Not happy

LOOKING AFTER THE RESPONSIBILITIES OF CHILDREN AT HOME

❖ **Hypothesis Statement** – More female farmers of rural area look after the responsibilities (nurturing, health, education, rituals ceremonies) of children at home.

Ho –no more number of female farmers looks after the responsibilities (nurturing, health, education, rituals ceremonies) of children at home.

Looking after the responsibilities Contd...

❖ The result

The study has following inferences –

Responsibility at home	Figures in %		
Nurturing of children (A)	Male	Both	Female
Health of Children (B)	04	21	75
Education of children (C)	12	32	56
Rituals ceremonies (D)	39	33	28
Responsibility at home	53	27	20

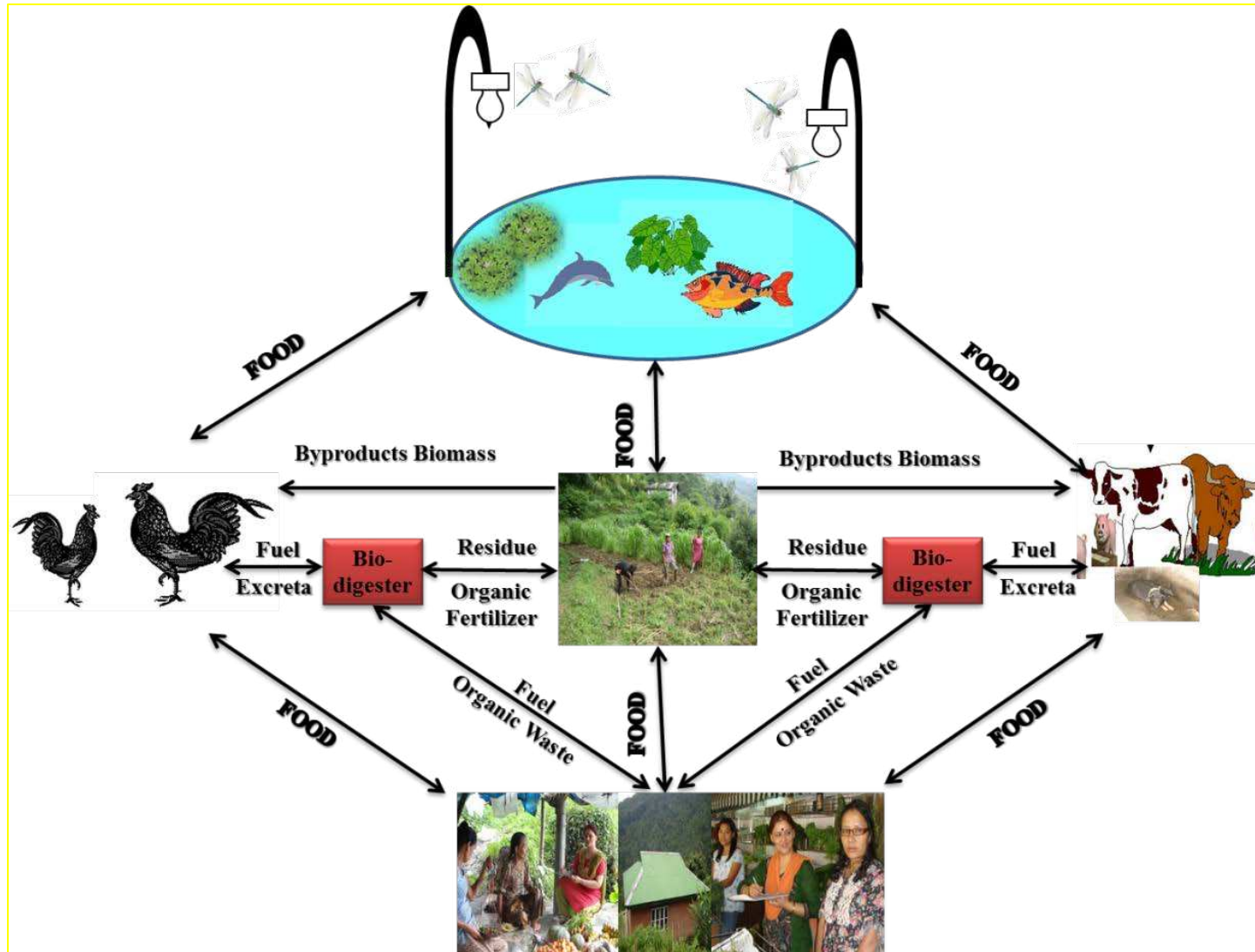
Looking after the responsibilities Contd...

❖ The result

t-test of inferential analysis

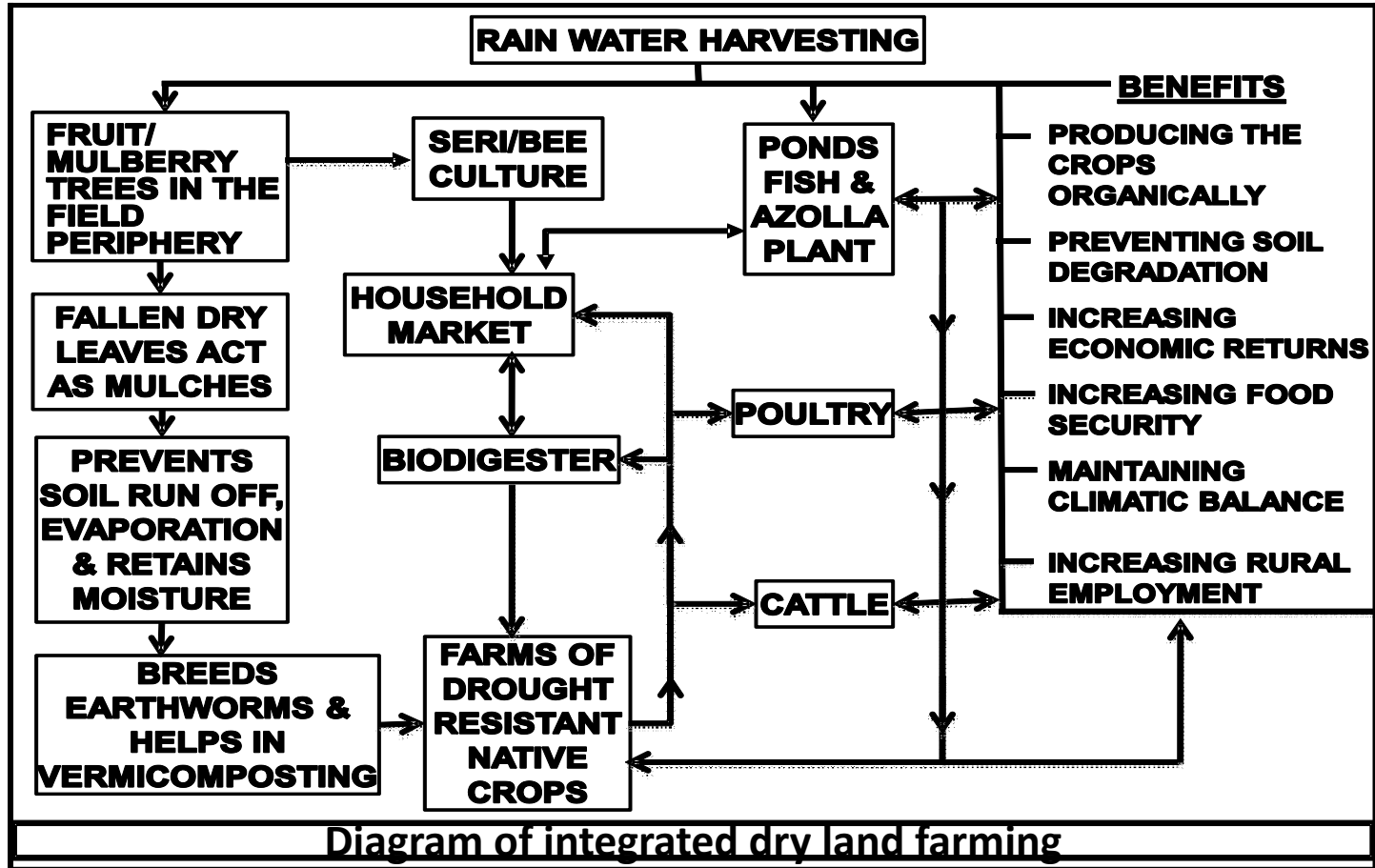
Table-4.7.2-One-sample test							Accept/ Reject null hypothesis	Conclusion
Test value= 2								
					95% confidence interval			
Responsibility at home	t	Sig. (2-tailed)	Mean Diff	Mean	Lower	Upper		
Nurturing of children (A)	20.607	.000	.713	2.71	.64	.78	Reject	Look after
Health of Children (B)	9.495	.000	.439	2.44	.35	.53	Reject	-do-
Education of children (C)	-1.946	.053	-.104	1.90	-.21	.00	Accept	Do not look after
Rituals ceremonies (D)	-6.465	.000	-.335	1.67	-.44	-.23	Accept	-do-

Integrated farming by rainwater harvesting



Integrated dry land farming by rainwater harvesting

Flow diagram of integrated dry land farming



Advantages

Advantages of the diagram given above

Helps in reducing greenhouse effect

Helps in producing the goods organically

Helps in Increasing the crop in a unit area in a sustainable way

Helpful in tackling waste management and deforestation problems

**Conclusion, Recommendations
&
Future Scope of Study**

Conclusion

Women discriminated in ownership

Women cultivators outnumber women agriculture labourers

Most women possess small land-holdings

Conclusion Contd...

Women are not much involved in farming decision-making

Women participation is high in certain activities and less in the other

Women have less access to production inputs

Women work for longer hours for farming activities

Women have less access to Institutional support

Women undertake greater familial responsibilities than men

Conclusion Contd...

Informal source of credit is used for commercial purpose

Women keen to give up farming activity

Female farmers are reluctant in absorbing the future generations in agriculture.

Female farmers keen in entrepreneurial activities but have limited understanding/capability for the same.

Women farmers are custodian of the considerable indigenous knowledge

Suggestions

Government to educate the farmers to feed livestock the Azolla plant to increase productivity

Government to ensure availability of bullocks for ploughing

Government to ensure more equitable property rights

Government to encourage greater participation of women in farming decision-making

Credit and other facilities be made gender-neutral

Mechanisms to enhance the income of small land-holders in subsistence economy may be devised

Government to promote the use of bio-digester to save time to be utilized in other productive chores

Technical capacity building of female farmers through extension workers in making agriculture sustainable

Institutional credit rather than moneylender be encouraged

Efforts be made to conserve the TK of the indigenous

Future of Study

Micro-credit status of farmers in Sikkim

Women's participation in decision-making on farm productivity

Economic valuation of the contribution made by women in farming sector

Interest of younger generation in taking up farming activities.

Problems and prospects in creating other income generating activities for female farmers

References

Acharya, M. (2003). Efforts at Promotion of Women in Nepal. Kathmandu: Tanka Prasad Acharya Foundation.

Arthur, W. (2000). Process design of Agricultural digesters. AD-NETT- A Network on Anaerobic digestion of Agro- industrial wastes, Anaerobic digestion : Making energy and solving modern waste problems edited by Henrik O 2000, p: 8-21.

Baumgartner, A. (1980). Mountain climates from a perspective of forest growth. In: Benecke, U. & Davis, M.R. (Eds.). Mountain Environments and Sub-alpine Tree Growth. New Zealand Forest Service, Wellington. pp. 27-39.

Bhadra Mita, (1991). Women in Tea Plantation in Women in Agriculture: Their Status and Role, Vol. 1, Edited by R.K. Puria, Northern Book Centre, New Delhi.

Bhagoliwal, T.N., (1976) Economics of labour & Social Welfare, Sahitya Bhawan, Agra, 1976, P-49.

Bhasin, M.K. & Bhasin, Veena. (1995). Sikkim Himalayas: Ecology and Resources Development, Kamla-Raj Enterprise, Delhi.

Bhatt, N., Shrestha, L., Thomas-Slayter, B. and Koirala, I. (1994). Managing Resources in Nepalese Village: Changing Dynamics of Gender, Caste and Ethnicity, Clark University, Massachusetts.

Botero ,R. and Preston, T. R.(1995). Low-cost bio digester for production of fuel and fertilizer from manure. Manuscript in edited CIPAV, Cali, Colombia, pp 1-20.

Chandrakala Diyali, A Situational Analysis of Women and Daughters in Sikkim, National Commission for Women, New Delhi available at <http://ncw.nic.in/pdfreports/Sikkim%20Book.pdf>

Deckard, Barbara S. (1983); The Women's Movement: Political, Socio-economic and Psychological Issues. Harper & Row Publishers, NY.

Denholm, Jeannette (1991). Agroforestry in mountain areas of the Hindu Kush-Himalayan region, Published by International Centre for Integrated Mountain Development (Kathmandu, Nepal), Volume 17 available at <http://www.getcited.org/pub/103267688>

References

Contd...

Grace, J. (2005). Who Owns the Farm? Rural Women's Access to Land and Livestock. Kabul:Afghanistan Research and Evaluation Unit (AREU).Implications, pp. 173-183, in: A.M.M.

Griffin, K. (1974). The Political Economy of Agrarian Change: An essay on the green revolution. London: Macmillan Publishing Company.

Haque T., (2003). Decent Work in Agriculture in India In a Report of the Asian Regional Workshop 18th to 21st August 2003, International Labour Office, Bangkok edited by D.P.A. Naidu and A. Navamukundan, Pp-194 available at <http://ilomirror.library.cornell.edu/public/english/dialogue/actrav/new/agsymp03/dwaa032.pdf>.

Hossain, M. (1989). Green Revolution in Bangladesh: Impact on growth and distribution of income. Dhaka: University Press Limited.

Hossain, M., Bose, M. L., Chowdhury, A. & Dick, R. M. (2003). Changes in Agrarian Relations and Livelihoods in Rural Bangladesh. In Agrarian Studies, Ramachandran, V. K. and Swaminathan M. (eds.), London: Zed Books, pp. 369-391.

IFPRI (2000). Resource Allocation and Empowerment of Women in Rural Bangladesh. International Food Policy Research Institute, Washington, DC.

Joshi Mahesh V., (1999). Women Rural Labourers: Problem and Prospects. 1991 APH Publishing Corporation, 5, Ansari Road, New Delhi.

Majumdar, R. C. and Pusalker, A. D. (Editors) (1951): The history and culture of the Indian people. Volume I, The Vedic age. Bombay: Bharatiya Vidya Bhavan 1951, p.394

Marshall Alfred, (1964). Principles of Economics, Macmillan & Company Ltd., London-1964, P-54.

Negi, S.S., (1991). Himalayan rivers, lakes and glaciers. Indus Publishing Co. New Delhi, pp.182.

Parrota, J.A., (2001). Healing Plants of Peninsular India. CABI, New York.

References

Contd...

Lewis, W. A., (1954). Economic development with unlimited supplies of labour. The Manchester school, Pp 131-191.

Prasad C. and Singh R.P., (1992). Farm Women: A precious Resource. in Women in Agriculture, Vol. 2, Education, Training and Development edited by R.K. Punia, 1992, Northern Book Centre, Ansari Road, New Delhi.

Pruthi, Raj Kumar; Rameshwari Devi and Romila Pruthi (2001). Status and Position of Women: In Ancient, Medieval and Modern India. Vedam books. ISBN 81-7594-078-6.

Rahman, H Z. (1998). Rethinking Land Reform. In Bangladesh Agriculture in the 21st Century, Faruqee Rashid (ed). Dhaka: The World Bank and University Press Limited. pp. 67-80.

Rajula Devi A.K. ,(1989). Women in agriculture and rural areas-India, Working Paper 183, Published by Michigan State University, April 1989.

Ramakrishnan, P.S., (1992), Shifting Agriculture and Sustainable Development: An Interdisciplinary Study from Northeastern India. UNESCO-MAB Series, Paris, Parthenon Publ., Carnforth, Lancs. U.K. p. 424. (republished by Oxford University Press, New Delhi 1993).

Rao, K.S. & Saxena, K.G. (1994). Sustainable Development and Rehabilitation of Degraded Village Lands in Himalaya. Bishen Singh Mahendra pal Singh, DehraDun.

Sathianathan, M. A. (1975). Biogas Achievements and Challenges. Assoc. Voluntary Agencies for Rural Development. New Delhi, India.

Sethi, Raj Mohini, (1991) .Women in Agriculture. Rawat Publications, Jaipur, Rajasthan.

Sharma, E., Sundriyal, R.C., Rai, S.C., Bhatt, Y.K., Rai, L.K., Sharma, R. & Rai, Y.K. (1992). Integrated Watershed Management. Gyanodaya Prakashan, Nainital.

References

Contd...

Sharma, M. (1995). Gender Implications of Changes in Technology and Cropping Patterns for Labor Use in Rice-Based Farming Systems in Nepal. Bangkok, Asian Institute of Technology.

Shiva Vandana, (1991). Most Farmers in India are Women, FAO, New Delhi, 1991.

Singh, R.L. (1971). India - A Regional Geography. National Geographical Society of India, Varanasi.

Sujaya, C.P. (2001). Climbing a long road : women in agriculture in India : ten years after Beijing. Chennai : M.S. Swaminathan Research Foundation. 132 p.

Trager, J. (1996). The Food Chronology, Aurum Press, London

Valdiya, K.S. (2001). Himalaya : Emergence and evolution. University Press Publ., Hyderabad, pp. 139.

Valdiya, K.S.(1993). Environmental status assessment – The Himalaya. In, Environmental problems and prospects in India (ed. M. Balakrishanan), Oxford & IBM Publishing Co. Pvt. Ltd., New Delhi.

Verma Shashi Kanta, (1992). Women in Agriculture: A Socio Economic Analysis. 1992, Concept Publishing Company, A 15-16, Commercial Building, Mohan Garden, New Delhi.

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