Chapter 6

Results and Discussion

This chapter deals with results derived by statistical analysis after interpretation of raw field data and discussion of each result in a systematic manner. The results and their pertaining discussions are presented according to the specific objectives of the study.

Agro-economic and Socio-psychological profile of the selected respondents

A profile provides for cross-sectional information of a situation. Agro-economic status refers to the position of an individual with reference to various indicators of agronomic condition in a farming community. The Socio-psychological status refers to the position of an individual with reference to various indicators of socio-economic condition in a farming community. Agro-economic and Socio-psychological status of selected respondent was calculated by adding the scores assigned to a category of each item.

Table: 6.1: Agro-economic and Socio-psychological profile of selected respondents.

(Conventional method of rice)

Items	Category	Frequency	Percentage (%)
Age (X_1)	40-49 50-59 60-69 70-79	39 29 23 9	39 29 23 9
Education (X_2)	Illiterate Primary Secondary Higher secondary Graduate and above	1 18 38 27 16	1 18 38 27 16
Family education status (X_3)	1.4-2.24 2.24-3.08 3.08-3.92 3.92-4.76	14 29 30 27	14 29 30 27
Primary occupation (X_{41})	Labour Caste occupation Business Independent profession Cultivation Service	13 11 20 9 41 6	13 11 20 9 41 6
Secondary occupation (X_{42})	No Labour Caste occupation Business Independent profession Cultivation	6 9 9 10 7 59	6 9 9 10 7 59

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Caste (X_5)	Scheduled tribe Scheduled caste OBC General	17 24 33 26	17 24 33 26
Family type (X_6)	Single family Joint family	58 42	58 42
Family size (X_7)	Up to 5 members Above 5 members	38 62	38 62
Family income primary (X_{81})	Less than 2500 2500-5000 5000-7500 7500-10000 More than 10,000	60 32 5 2 1	60 32 5 2 1
Family income secondary (X_{82})	0-1500 1500-3000 3000-4500 4500 and above	74 19 6 1	74 19 6 1
Farm size (X_9)	Less than 2.4 2.4-4.4 4.4-6.4 6.4-8.4 Above 8.4	51 25 11 8 5	51 25 11 8 5

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Social participation (X_{10})	None Member of one organization Member of more than one Office holder Wider public leader	33 36 18 7 6	33 36 18 7 6
Risk orientation (X_{11})	0-1.5 1.5-3 3-4.5 4.5-6 6-7.5	8 11 33 37 11	8 11 33 37 11
Index of farm mechanization (X_{12})	20-39 40-59 60-79 80-99	33 36 17 14	33 36 17 14
Cropping intensity (X_{13})	Less than 50 50-100 100-150 150-200	3 48 39 10	3 48 39 10
Selling % (X_{14})	40-55 55-70 70-85 85-100	5 12 52 31	5 12 52 31
Debt (X_{15})	No Yes	30 70	30 70
Migration (X_{16})	No Yes	88 12	88 12
Seed rate % (X_{21})	90-110 110-130 130-150 150-170	31 41 23 5	31 41 23 5
Fertilizer % (X_{22})	53.3-73.3 73.3-93.3 93.3-113.3 113.3-133.3	12 33 31 24	12 33 31 24

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Pesticide% (X_{23})	33.3-133.3 133.3-233.3 233.3-333.3 333.3-433.3	50 34 10 6	50 34 10 6
Weed management% (X_{24})	53.3-93.3 93.3-133.3 133.3-173.3 173.3-213.3	30 49 20 1	30 49 20 1
Water management% (X_{25})	Less than 25 25-74 75-124 Above 125	27 25 40 8	27 25 40 8
Irrigation index% (X_{26})	Less than 25 25-50 50-75 75-100	30 26 30 14	30 26 30 14
Sowing time (X_{27})	15june-25 June 26 june-5 July 6 july-15july 16 july-25 July	40 24 11 25	40 24 11 25
Varietal change (X_{28})	Due to climate change(1) Due to other reason(0)	58 42	58 42
Farm power (X_{29})	No drought animal(0) 1 to 2 drought animal(2) 3 to 4 drought animal(4) 5 to 6 drought animal(6)	13 38 24 25	13 38 24 25

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Change in rainfall pattern over last 20 year (X_{30})	(Out of 10 scale) Less than 2 2-3 4-5 6-8 Above 8	 2 14 12 34 38	 2 14 12 34 38
Change pattern in temperature (day/night) over last 20 year (X_{31})	(0- 10 scale) Less than 2 2-3 4-5 6-8 Above 8	4 11 13 40 32	4 11 13 40 32
Change pattern in weather disaster over last 20 year (X_{32})	(0- 10 scale) Less than 2 2-3 4-5 6-8 Above 8	3 13 17 38 29	3 13 17 38 29
Change in seasonal pattern over last 20 year (X_{33})	(0- 10 scale) Less than 2 2-3 4-5 6-8 Above 8	3 13 17 41 26	3 13 17 41 26
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	(0- 10 scale) 2-3 4-5 6-8 Above 8	4 10 45 41	4 10 45 41
Change pattern in weed problem over last 20 year (X_{35})	(0- 10 scale) Less than 2 2-3 4-5 6-8 Above 8	2 8 38 44 8	2 8 38 44 8

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Discussion

Table 6.1, it represents the frequency distribution of the respondents according to their Age, Education, Family education status, Primary occupation, Secondary occupation, Caste, Family type, Family size, Family income primary, Family income secondary, Farm size, Social participation, Risk orientation, Index of farm mechanization, Cropping intensity, Selling%, Debt, Migration, Seed rate%, Fertilizer%, Pesticide%, Weed management%, Water management%, Irrigation index%, Sowing time, Varietal change, Farm power, Change in rainfall pattern over last 20 year, Change pattern in temperature(day/night) over last 20 year, Change pattern in weather disaster over last 20 year, Change in seasonal pattern over last 20 year, Change pattern in insect/ pests & diseases over last 20 year, Change pattern in weed problem over last 20 year.

Age

The attribute caste has categorized four distinct categorized viz. 40-49, 50-59, 60-69, 70-79.The major percentage of the respondent is 40-49 (39%) and 50-59 category (29 %). 60-69 category (23%) and very less in 70-79 (9%) category.

Education

The attribute education has been five distinct categories viz. illiterate, primary, secondary, higher secondary, graduate and above etc. The major percentage of the respondent is secondary (38%) under the category education, followed by primary (18%),

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higher secondary (27%), graduate and above (16%), illiterate (1%).

Family education status

The attribute family education status has 4 distinct categories according to their education score viz. illiterate, primary, secondary, higher secondary, graduate and above etc. The major percentage of the family education status (30%) under the category 3.08-3.92. (secondary and higher secondary group).

Primary occupation

The attribute primary occupation has 6 distinct categories. The major percentage of the respondents (41%) under the category cultivation followed by the (20%) in business category and very less (6%) in service category.

Secondary occupation

The attribute secondary occupation has 6 distinct categories. The major percentage of the respondents (59%) under the category cultivation followed by the (10%) in business category and very less (6%) in no any secondary occupation category.

Caste

The attribute caste has 4 distinct categories. The major percentage of the respondents (33%) under the Obc (Other backward class) category followed by the (26%) in general category and very less (17%) in scheduled tribe category.

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Family type

The attribute family type has 2 distinct categories. The major percentage of the respondents (58%) under the single family category followed by the (42%) in joint family category.

Family size

The attribute family size has 2 distinct categories. The major percentage of the respondents (62%) under the above 5 member category followed by the (38%) in up to 5 members in the family category.

Family income primary

The attribute family income primary has 5 distinct categories. The major percentage of the respondents (60%) under less than 2500 category followed by the (32%) under 2500-5000 category.

Family income secondary

The attribute family income secondary has 4 distinct categories. The major percentage of the respondents (74%) under 0-1500 category followed by the (19%) under 1500-3000 category.

Farm size

The attribute farm size has 5 distinct categories. The major percentage of the respondents (51%) under less than 2.4 hectare farm size category followed by the (25%) under 2.4-4.4 hectare farm size category.

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Social participation

The attribute Social participation has 5 distinct categories. The major percentage of the respondents (36%) under the member of one organization category followed by the (33%) under no any social participation category.

Risk orientation

The attribute risk orientation has 5 distinct categories. The major percentage of the respondents (37%) under the 4.5-6 category means in between agree and strongly agree category towards the risk orientation followed by the (33%) under 3-4.5 means dis-agree and undecided category.

Index of farm mechanization

The attribute index of farm mechanization has 4 distinct categories on the basis of their total score. The major percentage of the respondents (36%) under the 40-59 score category followed by the (33%) under 20-39 score category.

Cropping intensity

The attribute cropping intensity has 3 distinct categories. The major percentage of the respondents (48%) under the 50-100% category followed by the (39%) under 100-150% cropping intensity category. in very less (3%) under less than 50 categories.

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Selling %

The attribute selling % has 4 distinct categories on the basis of their total selling of produce. The major percentage of the respondents (52%) under the 70-85 category followed by the (31%) under 85-100 category.

Debt

The attribute debt has 2 distinct categories. The major percentage of the respondents (70%) under the yes category followed by the (30%) under no category.

Migration

The attribute migration has 2 distinct categories. The major percentage of the respondents (88%) under the no category followed by the (12%) under yes category those wanted to migrate from one place to another place.

Seed Rate%

The attribute seed rate% has 4 distinct categories. The major percentage of the respondents (41%) under the 110-130 category followed by the (31%) under 90-110 category.

Fertilizer%

The attribute fertilizer% has 4 distinct categories. The major percentage of the respondents (33%) under the 73.3-93.3 category followed by the (31%) under 93.3-113.3 category.

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Pesticide%

The attribute pesticide% has 4 distinct categories. The major percentage of the respondents (50%) under the 33.3-133.3 category followed by the (34%) under 133.3-233.3 category. In very less (6%) under 333.3-433.3 category.

Weed management%

The attribute weed management% has 4 distinct categories. The major percentage of the respondents (49%) under the 93.3-133.3 category followed by the (30%) under 53.3-93.3 category. In very less (1%) under 173.3-213.3 category.

Water management%

The attribute water management% has 4 distinct categories. The major percentage of the respondents (40%) under the 75-124 category followed by the (27%) under less than 25 category. In very less (8%) under above 125 category.

Irrigation index%

The attribute irrigation index% has 4 distinct categories. The major percentage of the respondents (30%) under the 50-75 and less than 25 categories. In very less (14%) under above 75-100 category.

Sowing time

The attribute sowing time has 4 distinct categories. The major percentage of the respondents (40%) under the 15 June- 25 June

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category. followed by the (25%) under 16 July-25 July category. In very less (11%) under 6 July- 15 July category.

Varietal change

The attribute varietal change has 2 distinct categories. The major percentage of the respondents (58%) under the 1 category. followed by the (42%) under 0 categories.

Farm power

The attribute farm power has 4 distinct categories. The major percentage of the respondents (38%) under 1 to 2 drought animal category. followed by the (25%) under 5-6 drought animal category.

Change in rainfall pattern over last 20 year

The attribute change in rainfall pattern over last 20 year has 5 distinct categories. The major percentage of the respondents (38%) under above 8 category. followed by the (34%) under 6-8 category. In very less (2%) under less than 2 category.

Change pattern in temperature (day/night) over last 20 year

The attribute change pattern in temperature (day/night) over last 20 year has 5 distinct categories. The major percentage of the respondents (40%) under above 6-8 category. followed by the (32%) under above 8 categories. In very less (4%) under less than 2 category.

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Change pattern in weather disaster over last 20 year

The attribute change pattern in weather disaster over last 20 year has 5 distinct categories. The major percentage of the respondents (38%) under above 4-5 category. followed by the (29%) under 6-8 categories. In very less (3%) under less than 2 category.

Change in seasonal pattern over last 20 year

The attribute change in seasonal pattern over last 20 year has 5 distinct categories. The major percentage of the respondents (41%) under above 4-5 category. followed by the (26%) under 6-8 categories. In very less (3%) under less than 2 category.

Change pattern in insect/ pests & diseases over last 20 year

The attribute change pattern in insect/ pests & diseases over last 20 year has 4 distinct categories. The major percentage of the respondents (45%) under above 6-8 category. followed by the (41%) under above 8 categories. In very less (4%) under less than 2-3 category.

Change pattern in weed problem over last 20 year

The attribute change pattern in weed problem over last 20 year has 5 distinct categories. The major percentage of the respondents (44%) under above 6-8 category. followed by the (38%) under 4-5 categories. In very less (2%) under less than 2 category.

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Extension communication profile of selected respondents. (Conventional method of rice)

Table 6.2: Mass media exposure of selected respondents

Exposure to	Always		Very often		Some times		Very few		Never	
	F	%	F	%	F	%	F	%	F	%
Radio	25	25	27	27	33	33	11	11	4	4
Television	38	38	18	18	26	26	10	10	8	8
Educational film	9	9	10	10	15	15	18	18	48	48
News paper	18	18	4	4	10	10	30	30	38	38
Agril. magazine	0	0	0	0	2	2	16	16	82	82
Agricultural exhibition	7	7	14	14	21	21	27	27	31	31

Discussion

Table 6.2, showed that, in case of selected respondents the majority of the respondent had some time (33%) listen radio, followed by very often (27%), always (25%), very few (11%) and never (4%) listen radio respectively.

In case of selected respondents the majority of the respondent had always (38%) watching television, followed by sometimes (26%), very often (18%), very few (10%) and never (8%) watching television.

In case of selected respondents the majority of the respondent had never (48%) watching education film, followed by very few watching (18%), sometimes watching (15%) and very often watching (10%), and always watching (9%) educational film.

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In case selected respondents the majority of the respondent had never reading (38%) news paper, followed by very few reading (30%), always reading (18%), sometimes reading (10%) and very often reading (4 %).

In case of selected respondents the majority of the respondent had never reading (82%) agril. magazine, followed by very few reading (16%), sometime reading (2%) and no any respondents in always and very often category.

In case selected respondents the majority of the respondent had never (31%) going to agricultural exhibition, followed by very few going exhibition (27%), sometime (21%), very often going (14%) and always going (7%) agricultural exhibition.

Table 6.3: Utilization of personal cosmopolite sources of information

Statement	Always	Sometimes	Never
i) I use to travel outside my village during last year to visit place.	70	21	9
ii) I personally visited agriculture expert for his advice about my occupation.	17	43	40
iii) I use to contact with agriculture expert who visited my village for his advice/help during last year.	13	31	56
iv) I use to visit farmers of outside my village and seek their advice.	23	42	35
v) I use to invite people who visited my village for discussion about village development during last year.	13	18	69

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Discussion:

Table 6.3, showed that, in case of selected respondents the majority of the respondents always (70%) use to travel outside their village during last year to visit place, followed by (21%) sometimes use to travel outside their village during last year to visit place and never (9%) use to travel outside their village during last year to visit place.

In case of selected respondents the majority of the respondents sometimes (43%) personally visited agriculture expert for their advice about their occupation, followed by (40%) never personally visited agriculture expert for their advice about their occupation and always (17%) personally visited agriculture expert for their advice about their occupation.

In case of selected respondents the majority of the respondents never (56%) use to contact with agriculture expert who visited their village for their advice/help during last year, followed by sometimes (31%) use to contact with agriculture expert who visited their village for their advice/help during last year and always (13%) use to contact with agriculture expert who visited their village for their advice/help during last year.

In case of selected respondents the majority of the respondents sometimes (42%) use to visit farmers of outside their village and seek their advice, followed by never (35%) use to visit farmers of outside their village and seek their advice and always (23%) use to visit farmers of outside their village and seek their advice.

In case of selected respondents the majority of the respondents never (69%) use to invite people who visited their village for discussion about village development during last year, followed by sometimes (18%) use to invite people who visited their village for discussion about village development during last year and always (13%) use to invite people who visited their village for discussion about village development during last year.

Table 6.4: Utilization of personal localite sources of information

Source	Very often	often	Sometimes	Never
i) Local agents	31	42	17	10
ii) Local leader	9	32	23	36
iii) Friends/relative/neighbors	43	12	31	14
iv) Experienced/ progressive farmers	18	31	40	11

Discussion:

Table 6.4, showed that, in case of selected respondents the majority of the respondents often (42%) had utilized the personal localite sources of information from local agents, followed by very often (31%) respondents had utilized the personal localite sources of information from local agents, sometimes (17%) had utilized the personal localite sources of information from local agents and never (10%) respondents had utilized the personal localite sources of information from local agents.

In case of selected respondents the majority of the respondents never (36%) had utilized the personal localite sources of information from local leaders; followed by often

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(32%) respondents had utilized the personal localite sources of information from local leaders, sometimes (23%) respondents had utilized the personal localite sources of information from local leaders and very often (9%) respondents had utilized the personal localite sources of information from local leaders.

In case of selected respondents the majority of the respondents very often (43%) had utilized the personal localite sources of information from friends/ relative/neighbors, followed by sometimes (31%) respondents had utilized the personal localite sources of information from friends/ relative/neighbors, never (14%) respondents had utilized the personal localite sources of information from friends/ relative/neighbors and often (12%) had utilized the personal localite sources of information from friends/ relative/neighbors.

In case of selected respondents the majority of the respondents sometimes (40%) had utilized the personal localite sources of information from experienced/ progressive farmers, followed by often (31%) respondents had utilized the personal localite sources of information from experienced/ progressive farmers, very often (18%) had utilized the personal localite sources of information from experienced/ progressive farmers and never (11%) respondents had utilized the personal localite sources of information from experienced/ progressive farmers.

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Table 6.5: Contact with extension personal

SN	Extension worker	Most often	Often	Sometimes	Rarely	Never
1	A.D.O.	17	32	19	9	23
2	B.D.O.	9	16	25	12	38
3	Agril supervisor	21	5	17	41	16
4	Agril officer (T & V)	32	11	14	9	34
5	Agril scientist	15	9	31	12	33
6	Fertilizer dealer	41	30	19	7	3
7	Private company(seed/pesticide)	5	7	14	9	65

Discussion:

Table 6.5, showed that, in case of selected respondents the majority of the respondents often (32%) had contact with Agriculture development officer (A.d.o.), followed by never (23%) had contact with Agriculture development officer (A.d.o.), sometimes (19%) had contact with Agriculture development officer (A.d.o.), most often (17%) had contact with Agriculture development officer (A.d.o.) and rarely (9%) had contact with Agriculture development officer (A.d.o.).

In case of selected respondents the majority of the respondents never (38%) had contact with Block development officer (B.d.o.), followed by sometimes (25%) had contact with Block development officer (B.d.o.), often (16%) had contact with Block development officer (B.d.o.), rarely (12%) had contact with Block development officer (B.d.o.) and most often (9%) had contact with Block development officer (B.d.o).

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In case of selected respondents the majority of the respondents rarely (41%) had contact with agril supervisor, followed by most often (21%) had contact with agril supervisor, sometimes (17%) had contact with agril supervisor, never (16%) had contact with agril supervisor and often (5%) had contact with agril supervisor.

In case of selected respondents the majority of the respondents never (34%) had contact with agril officer (t & v), followed by most often (32%) had contact with agril officer (t & v), sometimes (14%) had contact with agril officer (t & v), often (11%) had contact with agril officer (t & v), and rarely (9%) had contact with agril officer (t & v).

In case of selected respondents the majority of the respondents never (33%) had contact with agril scientist, followed by sometimes (31%) had contact with agril scientist, most often (15%) had contact with agril scientist, rarely (12%) had contact with agril scientist, and often (9%) had contact with agril scientist.

In case of selected respondents the majority of the respondents most often (41%) had contact with fertilizer dealer, followed by often (30%) had contact with fertilizer dealer, sometimes (19%) had contact with fertilizer dealer, rarely (7%) had contact with fertilizer dealer, and never (3%) had contact with fertilizer dealer.

In case of selected respondents the majority of the respondents never (65%) had contact with private company

(seed/pesticide),followed by sometimes (14%) had contact with private company (seed/pesticide), rarely (9%) had contact with private company (seed/pesticide),often(7%) had contact with private company (seed/pesticide), and most often (5%) had contact with private company (seed/pesticide).

Table 6.6: Agro-economic and Socio-psychological profile of selected respondents. (SRI method of rice)

Items	Category	Frequency	Percentage (%)
Age (X_1)	40-49 50-59 60-69 70-79	33 31 22 14	33 31 22 14
Education (X_2)	Illiterate Primary Secondary Higher secondary Graduate and above	2 17 42 23 16	2 17 42 23 16
Family education status (X_3)	1-2 2-3 3-4 4-5	26 35 25 14	26 35 25 14
Primary occupation (X_{41})	None Labour Caste occupation Business Independent profession Cultivation Service	11 1 23 13 42 10	11 1 23 13 42 10

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Secondary occupation (X_{42})	None Labour Caste occupation Business Independent profession Cultivation	 20 4 6 7 5 58	 20 4 6 7 5 58
Caste (X_5)	Schedule tribe Scheduled caste OBC General	 20 26 27 27	 20 26 27 27
Family type (X_6)	Single family Joint family	54 46	54 46
Family size (X_7)	Up to 5 members Above 5 members	 44 56	 44 56
Family income primary (X_{81})	Less than 2500 2500-5000 5000-7500 7500-10000 More than 10,000	 36 24 18 13 9	 36 24 18 13 9
Family income secondary (X_{82})	0-1500 1500-3000 3000-4500 Above 6000	86 9 4 1	86 9 4 1
Farm size (X_9)	Less than 2.4 2.4-4.4 4.4-6.4 6.4-8.4	59 27 10 4	59 27 10 4

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Social participation (X_{10})	None Member of one organization Member of more than one Office holder Wider public leader	0 34 24 30 52	0 34 24 30 52
Risk orientation (X_{11})	0-1.5 1.5-3 3-4.5 4.5-6 6-7.5	22 14 23 22 19	22 14 23 22 19
Index of farm mechanization (X_{12})	20-39 40-59 60-79 80-99	22 38 21 19	22 38 21 19
Cropping intensity (X_{13})	50-100 100-150 150-200	51 43 6	51 43 6
Selling% (X_{14})	40-55 55-70 70-85 85-100	8 24 39 29	8 24 39 29
Debt (X_{15})	No Yes	21 79	21 79
Migration (X_{16})	No Yes	92 8	92 8
Seed rate% (X_{21})	100-199 200-299 300-399 400-499	48 30 15 7	48 30 15 7
Fertilizer% (X_{22})	53.3-73.3 73.3-93.3 93.3-113.3 113.3-133.3	8 36 43 13	8 36 43 13

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Pesticide% (X_{23})	70-119 120-169 170-219 220-269	56 33 9 2	56 33 9 2
Weed management% (X_{24})	Less than 80 80-120 120-160 Above 160	8 63 22 7	8 63 22 7
Water management% (X_{25})	Less than 80 80-100 100-120 Above 120	14 34 51 1	14 34 51 1
Irrigation index% (X_{26})	Less than 70 70-90 Above 90	10 53 37	10 53 37
Sowing time (X_{27})	15 July-23 July 24 July-31 July 1 August-8 August	38 32 30	38 32 30
Varietal change (X_{28})	Due to climate change(1) Due to other reason(0)	64 36	64 36
Farm power (X_{29})	No drought animal(0) 1 to 2 drought animal(2) 3 to 4 drought animal(4) 5 to 6 drought animal(6)	22 38 23 17	22 38 23 17

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Change in rainfall pattern over last 20 year (X_{30})	(0- 10 scale) Less than 2 2-3 4-5 6-8 Above 8	 1 7 14 50 28	 1 7 14 50 28
Change pattern in temperature (day/night) over last 20 year (X_{31})	(0- 10 scale) Less than 2 2-3 4-5 6-8 Above 8	 3 9 23 51 14	 3 9 23 51 14
Change pattern in weather disaster over last 20 Year (X_{32})	(0- 10 scale) Less than 2 2-3 4-5 6-8 Above 8	 3 16 20 46 15	 3 16 20 46 15
Change in seasonal pattern over last 20 year (X_{33})	(0- 10 scale) Less than 2 2-3 4-5 6-8 Above 8	 4 13 18 51 14	 4 13 18 51 14
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	(0- 10 scale) 2-3 4-5 6-8 Above 8	3 14 30 53	3 14 30 53
Change pattern in weed problem over last 20 year (X_{35})	(0- 10 scale) 4-5 6-7 Above 8	5 21 74	5 21 74

Discussion:

Table 6.6, Represents the frequency distribution of the respondents according to their age, education, family education

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status, primary occupation, secondary occupation, caste, family type, family size, family income primary ,family income secondary, farm size, social participation, risk orientation, index of farm mechanization, cropping intensity, selling%, debt, migration, seed rate%, fertilizer%, pesticide%, weed management%, water management%, irrigation index%, sowing time, varietal change, farm power, change in rainfall pattern over last 20 year, change pattern in temperature(day/night) over last 20 year, change pattern in weather disaster over last 20 year, change in seasonal pattern over last 20 year, change pattern in insect/ pests & diseases over last 20 year, change pattern in weed problem over last 20 year.

Age

The attribute caste has categorized four distinct categorized viz. 40-49, 50-59, 60-69, 70-79.The major percentage of the respondent is 40-49 (33%) and 50-59 category (31 %). 60-69 category (22%) and very less in 70-79 (14%) category.

Education

The attribute education has been five distinct categories viz. Illiterate, Primary, Secondary, Higher secondary, Graduate and above etc. The major percentage of the respondent is secondary (42%) under the category secondary education, followed by higher secondary (23%). In very less (2%) under illiterate category.

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Family education status

The attribute family education status has 4 distinct categories according to their education score viz. illiterate, primary, secondary, higher secondary, graduate and above etc. The major percentage of the family education status (35%) under the category 2-3. (Secondary and higher secondary group).

Primary occupation

The attribute primary occupation has 6 distinct categories. The major percentage of the respondents (42%) under the category cultivation followed by the (23%) in business category and very less (1%) in labour category.

Secondary occupation

The attribute secondary occupation has 6 distinct categories. The major percentage of the respondents (58%) under the category cultivation followed by the (20%) in none category and very less (4%) in labour category.

Caste

The attribute caste has 4 distinct categories. The major percentage of the respondents (27%) under the OBC (Other backward class) & general category and very less (20%) in scheduled tribe category.

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Family type

The attribute family type has 2 distinct categories. The major percentage of the respondents (54%) under the single family category followed by the (46%) in joint family category.

Family size

The attribute family size has 2 distinct categories. The major percentage of the respondents (56%) under the above 5 member category followed by the (44%) in up to 5 members in the family category.

Family income primary

The attribute family income primary has 5 distinct categories. The major percentage of the respondents (36%) under less than 2500 category followed by the (24%) under 2500-5000 category.

Family income secondary

The attribute family income secondary has 4 distinct categories. The major percentage of the respondents (86%) under 0-1500 category followed by the (9%) under 1500-3000 category.

Farm size

The attribute farm size has 5 distinct categories. The major percentage of the respondents (59%) under less than 2.4 hectare farm size category followed by the (27%) under 2.4-4.4 hectare farm size category.

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Social participation

The attribute social participation has 5 distinct categories. The major percentage of the respondents (52%) under wider public leader category followed by the (34%) under member of one organization category.

Risk orientation

The attribute risk orientation has 5 distinct categories. The major percentage of the respondents (23%) under the 3-4.5 category means in between dis-agree and undecided category towards the risk orientation followed by the (22%) under 0-1.5 means strongly dis- agree category.

Index of farm mechanization

The attribute index of farm mechanization has 4 distinct categories on the basis of their total score. The major percentage of the respondents (38%) under the 40-59 score category followed by the (22%) under 20-39 score category.

Cropping intensity

The attribute cropping intensity has 3 distinct categories. The major percentage of the respondents (51%) under the 50-100% category followed by the (43%) under 100-150% cropping intensity category. In very less (6%) under 150-200 category.

Selling%

The attribute selling% has 4 distinct categories on the basis of their total selling of produce. The major percentage of the

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respondents (39%) under the 70-85 category followed by the (29%) under 85-100 category.

Debt

The attribute debt has 2 distinct categories. The major percentage of the respondents (79%) under the yes category followed by the (21%) under no category.

Migration

The attribute migration has 2 distinct categories. The major percentage of the respondents (92%) under the no category followed by the (8%) under yes category those wanted to migrate from one place to another place.

Seed rate%

The attribute seed rate% has 4 distinct categories. The major percentage of the respondents (48%) under the 100-199 category followed by the (30%) under 200-299 category.

Fertilizer%

The attribute fertilizer% has 4 distinct categories. The major percentage of the respondents (43%) under the 93.3-113.3 category followed by the (36%) under 73.3-93.3 category.

Pesticide%

The attribute pesticide% has 4 distinct categories. The major percentage of the respondents (56%) under the 70-119 category followed by the (33%) under 120-169 category. In very less (2%) under 220-269 category.

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Weed management%

The attribute weed management% has 4 distinct categories. The major percentage of the respondents (63%) under the 80-120 category followed by the (22%) under 120-160 category. In very less (7%) under above 160 category.

Water management%

The attribute water management% has 4 distinct categories. The major percentage of the respondents (51%) under the 100-120 category followed by the (34%) under 80-100 category. In very less (1%) under above 120 category.

Irrigation index%

The attribute irrigation index% has 3 distinct categories. The major percentage of the respondents (53%) under the 70-90 categories. In very less (10%) under less than 70 category.

Sowing time

The attribute sowing time has 3 distinct categories. The major percentage of the respondents (38%) under the 15 July – 23 July category. followed by the (32%) under 24 July-31 July category. In very less (30%) under 1 august – 8 august category.

Varietal change

The attribute varietal change has 2 distinct categories. The major percentage of the respondents (64%) under the 1 category. followed by the (36%) under 0 categories.

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Farm power

The attribute farm power has 4 distinct categories. The major percentage of the respondents (38%) under 1 to 2 drought animal category. followed by the (23%) under 3-4 drought animal category.

Change in rainfall pattern over last 20 year

The attribute change in rainfall pattern over last 20 year has 5 distinct categories. The major percentage of the respondents (50%) under 4-5 category. followed by the (28%) under 6-8 category. In very less (1%) under less than 2 category.

Change pattern in temperature (day/night) over last 20 year

The attribute change pattern in temperature (day/night) over last 20 year has 5 distinct categories. The major percentage of the respondents (51%) under above 4-5 category. followed by the (23%) under 2-3 categories. In very less (3%) under less than 2 category.

Change pattern in weather disaster over last 20 year

The attribute change pattern in weather disaster over last 20 year has 5 distinct categories. The major percentage of the respondents (46%) under above 6-8 category, followed by the (20%) under 4-5 categories. In very less (3%) under less than 2 category.

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Change in seasonal pattern over last 20 year

The attribute change in seasonal pattern over last 20 year has 5 distinct categories. The major percentage of the respondents (51%) under above 6-8 category, followed by the (18%) under 4-5 categories. In very less (4%) under less than 2 category.

Change pattern in insect/ pests & diseases over last 20 year

The attribute change pattern in insect/ pests & diseases over last 20 year has 4 distinct categories. The major percentage of the respondents (53%) under above 8 category, followed by the (30%) under 6-8 categories. In very less (3%) under 2-3 category.

Change pattern in weed problem over last 20 year

The attribute change pattern in weed problem over last 20 year has 3 distinct categories. The major percentage of the respondents (74%) under above 8 category, followed by the (21%) under 6-7 categories. In very less (5%) under 4-5 category.

Extension communication profile of selected respondents. (SRI method of rice)

Table 6.7: Mass media exposure of selected respondents

Exposure to	Always		Very often		Some times		Very few		Never	
	F	%	F	%	F	%	F	%	F	%
Radio	35	35	9	9	15	15	11	11	30	30
Television	29	29	27	27	23	23	10	10	11	11

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Educational film	12	12	9	9	17	17	21	21	41	41
News paper	36	36	14	14	12	12	23	23	15	15
Agril. magazine	7	7	4	4	13	13	18	18	58	58
Agricultural Exhibition	11	11	10	10	27	27	35	35	17	17

Discussion

Table 6.7, showed that, in case of selected respondents the majority of the respondent had always (35%) listen radio, followed by never (30%), sometimes (15%), very few (11%) and very often (9%) listen radio respectively.

In case of selected respondents the majority of the respondent had always (29%) watching television, followed by very often (27%), sometimes (23%), never (11%) and very few (10%) watching television.

In case of selected respondents the majority of the respondent had never (41%) watching education film, followed by very few watching (21%), sometimes watching (17%) and always watching (12%), and very often (9%) watching educational film.

In case selected respondents the majority of the respondent had always reading (36%) news paper, followed by very few reading (23%), never reading (15%), very often reading (14%) and sometimes reading (12%).

In case of selected respondents the majority of the respondent had never reading (58%) agril. magazine, followed by

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very few reading (18%), sometime reading (13%) always reading (7%) and very often (4%) reading argil magazine.

In case selected respondents the majority of the respondent had very few (35%) going to agricultural exhibition, followed by sometimes going exhibition (27%), never (17%) , always going (11%) and very often going (10%) agricultural exhibition.

Table 6.8: Utilization of personal cosmopolite sources of information

Statement	Always	Sometimes	Never
i) I use to travel outside my village during last year to visit place.	41	35	24
ii) I personally visited agriculture expert for his advice about my occupation.	21	38	41
iii) I use to contact with agriculture expert who visited my village for his advice/help during last year.	41	26	33
iv) I use to visit farmers of outside my village and seek their advice.	41	28	31
v) I use to invite people who visited my village for discussion about village development during last year.	24	42	34

Discussion:

Table 6.8, showed that, in case of selected respondents the majority of the respondents always (41%) use to travel outside their village during last year to visit place, followed by (35%) sometimes use to travel outside their village during last year to visit place and never (24%) use to travel outside their village during last year to visit place.

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In case of selected respondents the majority of the respondents never (41%) personally visited agriculture expert for their advice about their occupation, followed by sometimes (38%) personally visited agriculture expert for their advice about their occupation and always (21%) personally visited agriculture expert for their advice about their occupation.

In case of selected respondents the majority of the respondents always (41%) use to contact with agriculture expert who visited their village for their advice/help during last year, followed by never (33%) use to contact with agriculture expert who visited their village for their advice/help during last year and sometimes (26%) use to contact with agriculture expert who visited their village for their advice/help during last year.

In case of selected respondents the majority of the respondents always (41%) use to visit farmers of outside their village and seek their advice, followed by never (31%) use to visit farmers of outside their village and seek their advice and sometimes (28%) use to visit farmers of outside their village and seek their advice.

In case of selected respondents the majority of the respondents sometimes (42%) use to invite people who visited their village for discussion about village development during last year, followed by never (34%) use to invite people who visited their village for discussion about village development during last year and always (24%) use to invite people who visited their village for discussion about village development during last year.

Table 6.9: Utilization of personal localite sources of information

Source	Very often	often	Sometimes	Never
i) Local agents	40	21	9	30
ii) Local leader	12	41	11	36
iii) Friends/relative/neighbours	51	19	30	0
iv) Experienced/ progressive farmers	21	39	23	17

Discussion:

Table 6.9, it showed that, in case of selected respondents the majority of the respondents very often (40%) had utilized the personal localite sources of information from local agents, followed by never (30%) respondents had utilized the personal localite sources of information from local agents, often (21%) had utilized the personal localite sources of information from local agents and sometimes (9%) respondents had utilized the personal localite sources of information from local agents.

In case of selected respondents the majority of the respondents often (41%) had utilized the personal localite sources of information from local leaders; followed by never (36%) respondents had utilized the personal localite sources of information from local leaders, very often (12%) respondents had utilized the personal localite sources of information from local leaders and sometimes (11%) respondents had utilized the personal localite sources of information from local leaders.

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In case of selected respondents the majority of the respondents very often (51%) had utilized the personal localite sources of information from friends/ relative/neighbors, followed by sometimes (30%) respondents had utilized the personal localite sources of information from friends/relative/neighbors, often (19%) respondents had utilized the personal localite sources of information from friends/ relative/neighbors and there had no any respondents in never category.

In case of selected respondents the majority of the respondents often (39%) had utilized the personal localite sources of information from experienced/ progressive farmers, followed by sometimes (23%) respondents had utilized the personal localite sources of information from experienced/ progressive farmers, very often (21%) had utilized the personal localite sources of information from experienced/ progressive farmers and never (17%) respondents had utilized the personal localite sources of information from experienced/ progressive farmers.

Table 6.10: Contact with extension personal

SN	Extension worker	Most often	Often	Sometimes	Rarely	Never
1	A.D.O.	12	18	27	14	29
2	B.D.O.	13	21	35	7	24
3	Agril supervisor	18	11	24	37	10
4	Agril officer (T & V)	41	9	6	31	13
5	Agril scientist	21	14	8	21	36
6	Fertilizer dealer	61	17	4	12	6

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7	Private company(seed/pesticide)	9	11	6	21	53

Discussion:

Table 6.10, it showed that, in case of selected respondents the majority of the respondents never (29%) had contact with Agriculture development officer (A.d.o.), followed by sometimes (27%) had contact with Agriculture development officer (A.d.o.), often (18%) had contact with Agriculture development officer (A.d.o.), rarely (14%) had contact with Agriculture development officer (A.d.o.) and most often (12%) had contact with Agriculture development officer (A.d.o.)

In case of selected respondents the majority of the respondents sometimes (35%) had contact with Block development officer (B.d.o.), followed by never (24%) had contact with Block development officer (B.d.o.), often (21%) had contact with Block development officer (B.d.o.), most often (13%) had contact with Block development officer (B.d.o.) and rarely (7%) had contact with Block development officer (B.d.o).

In case of selected respondents the majority of the respondents rarely (37%) had contact with agril supervisor, followed by sometimes (24%) had contact with agril supervisor, most often (18%) had contact with agril supervisor, often (11%) had contact with agril supervisor and never (10%) had contact with agril supervisor.

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In case of selected respondents the majority of the respondents most often (41%) had contact with agril officer (t & v), followed by rarely (31%) had contact with agril officer (t & v), never (13%) had contact with agril officer (t & v), often (9%) had contact with agril officer (t & v), and sometimes (6%) had contact with agril officer (t & v).

In case of selected respondents the majority of the respondents never (36%) had contact with agril scientist, followed by rarely and most often (21%) had contact with agril scientist, often (14%) had contact with agril scientist, and sometimes (8%) had contact with agril scientist.

In case of selected respondents the majority of the respondents most often (61%) had contact with fertilizer dealer, followed by often (17%) had contact with fertilizer dealer, rarely (12%) had contact with fertilizer dealer, never (6%) had contact with fertilizer dealer, and sometimes (4%) had contact with fertilizer dealer.

In case of selected respondents the majority of the respondents never (53%) had contact with private company (seed/pesticide), followed by rarely (21%) had contact with private company (seed/pesticide), often (11%) had contact with private company (seed/pesticide), most often (9%) had contact with private company (seed/pesticide), and sometimes (6%) had contact with private company (seed/pesticide).

Table 6.11: Descriptive analysis of the independent and dependent variables (Conventional method of rice)

Descriptive statistics						
Variables	**N**	**Minimum**	**Maximum**	**Mean**	**Std. deviation**	**CV (%)**
Age (X_1)	100	40	75	54.49	9.449333	17.34141
Education (X_2)	100	0	16	8.65	3.881688	44.875
Family education status (X_3)	100	1.4	4.75	3.2301	0.925402	28.64933
Primary occupation (X_{41})	100	1	6	3.72	1.543243	41.48504
Secondary occupation (X_{42})	100	0	5	3.8	1.667333.	43.87719
Caste (X_5)	100	1	4	2.68	1.038075	38.73415
Family type (X_6)	100	1	2	1.42	0.493559	34.75764
Family size (X_7)	100	2	13	6.43	3.134502	48.74808
Family income primary (X_{81})	100	247.8	15000	3060.249	2354.3	76.93164
Family income secondary (X_{82})	100	0	7032.5	1091.375	1098.441	100.6474
Farm Size (X_9)	100	0.4	10	2.8758	2.453884	85.32873

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Social participation (X_{10})	100	0	4	1.17	1.140658	97.49211
Risk orientation (X_{11})	100	1	7	4.074	1.5304	37.56505
Index of farm mechanization (X_{12})	100	20	96	50.52	19.39458	38.3899
Cropping intensity (X_{13})	100	42.92	200	95.3743	32.05064	33.60512
Selling% (X_{14})	100	45	95.7	78.002	10.93099	14.01373
Debt (X_{15})	100	0	1	0.7	0.458258	65.46537
Migration (X_{16})	100	0	1	0.12	0.324962	270.8016
Mass media exposure (X_{17})	100	0.33	3.33	1.6104	0.669193	41.55448
Utilization of personal cosmopolite sources of information (X_{18})	100	0.2	3	1.52	0.789937	51.96952
Utilization of personal localite sources of information (X_{19})	100	0.25	3	1.694	0.769717	45.43783

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Contact with extension personal (X_{20})	100	0.14	3.71	1.6409	0.923372	56.2723
Seed rate% (X_{21})	100	90	157.5	119.35	16.90643	14.16542

Descriptive statistics						
Variables	**N**	**Minimum**	**Maximum**	**Mean**	**Std. deviation**	**CV (%)**
Fertilizer% (X_{22})	100	53.3	133.3	96.212	18.68361	19.41921
Pesticide% (X_{23})	100	33.3	400	149.747	73.87725	49.33471
Weed management % (X_{24})	100	53.3	186.6	107.885	27.84443	25.80936
Water management % (X_{25})	100	0	104	58.62	38.04465	64.90047
Irrigation index% (X_{26})	100	0	88.7	39.338	29.16121	74.12987
Sowing time (X_{27})	100	1	4	2.21	1.210744	54.78478
Varietal change (X_{28})	100	0	1	0.58	0.493559	85.09629
Farm power (X_{29})	100	0	6	3.22	1.997899	62.04655
Change in rainfall pattern over last 20 year (X_{30})	100	1	10	7.11	2.622575	36.88573

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Change pattern in temperature (day/night) over last 20 year (X_{31})	100	1	10	6.85	2.562713	37.41187
Change pattern in weather disaster over last 20 year (X_{32})	100	1	10	6.61	2.568638	38.85988
Change in seasonal pattern over last 20 year (X_{33})	100	1	10	6.55	2.471336	37.73032
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	100	2	10	7.59	1.918828	25.281
Change pattern in weed problem over last 20 year (X_{35})	100	1	10	5.79	2.016408	34.82569
Net return from rice (Y_1)	100	-13700	72500	4404.62	14963.82	339.7301
Expenditure on health care (Y_2)	100	140	5500	1281.17	810.5059	63.26.26294

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Table 6.11, it presents the descriptive analysis on the distribution nature of different independent and dependent variables.

The distribution pattern of variable age (X_1) depicts that the minimum age of the respondents was 40 and the maximum was 75. Since the age of the respondents had not been pre-categorized or pre-specified, the distribution of the age was quite natural. The mean age is 54.49 with a standard deviation of 9.449333.The coefficient of variance (CV) has been 17.34141% which indicates that the distribution of the variable has been quite consistent.

The distribution pattern of variable education (X_2) shows the minimum education level is 0 while the maximum is 16. This shows that some of the respondents are illiterate who do not study at all while others studied as high as graduate and above. The mean education is 8.65 with a standard deviation of 3.881688. The coefficient of variance (CV) is 44.875% which indicates that the distribution of variable is consistent.

The distribution pattern of variable family education status (X_3) shows that the minimum rank is 1.4 while the maximum rank is 4.75. This indicates that overall family education status. It shows the minimum education level is from illiterate to graduate and above. The mean family education status is 3.2301 with a standard deviation of 0.925402. The coefficient of variance (CV) is 28.64933% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable primary occupation (X_{41}) shows that the minimum rank is 1 while the maximum rank is 6. This indicates that farmer is minimum labour (1) and maximum doing service (6).The mean primary occupation is 3.72 with the standard deviation of 1.543243. The coefficient of variance (CV) is 41.48504% which indicates that the distribution of variable is consistent.

The distribution pattern of variable secondary occupation (X_{42}) shows that the minimum rank is (0) while the maximum rank is (5). The zero indicates that farmer is not doing any other occupation and 5 indicate that maximum he is doing cultivation. The mean secondary occupation is 3.8 with the standard deviation of 1.667333. The coefficient of variance (CV) is 43.87719% which indicates that the distribution of variable is consistent.

The distribution pattern of variable caste (X_5) shows that the minimum caste of farmer is (1) which means scheduled tribe category while the maximum caste of farmer is (4) which mean having general caste category. The mean caste is 2.68 with the standard deviation of 1.038075. The coefficient of variance (CV) is 38.73415% which indicates that the distribution of variable is consistent.

The distribution pattern of variable family type (X_6) shows that the minimum family type is 1 while the maximum family type is 2. The mean family type is 1.42 with the standard deviation of

0.493559. The coefficient of variance (CV) is 34.75764% which indicates that the distribution of variable is consistent.

The distribution pattern of variable family size (X_7) shows that the minimum family size is 2 while the maximum family size is 13. The mean family size is 6.43 with the standard deviation of 3.134502. The coefficient of variance (CV) is 48.74808% which indicates that the distribution of variable is consistent.

The distribution pattern of variable family income primary (X_{81}) shows that the minimum primary income of the respondent is as low as 247.8 while the maximum is as high as 15000. The mean primary income is 3060.249 with a standard deviation of 2354.3.The coefficient of variance (CV) is 76.93164% which indicates that the distribution of variable is consistent.

The distribution pattern of variable family income secondary (X_{82}) shows that the minimum secondary income of the respondent is as low as 0 while the maximum is as high as 7032.5. The mean secondary income is 1091.375with a standard deviation of 1098.441.The coefficient of variance (CV) is 100.6474% which indicates that the distribution of variable is consistent.

The distribution pattern of variable farm size (X_9) shows that the minimum farm size of the respondent is as low as 0.4 while the maximum is as high as 10 hectare. The mean farm size is 2.8758 with a standard deviation of 2.453884.The coefficient of variance (CV) is 85.32873% which indicates that the distribution of variable is consistent.

The distribution pattern of variable social participation (X_{10}) shows that the minimum range is 0 while the maximum range is 4. Zero indicates that some of the respondents had no any social participation while others had as many as wider public leaders. The mean social participation is 1.17 with a standard deviation of 1.140658. The coefficient of variance (CV) is 97.49211% which indicate that the distribution of variable is consistent.

The distribution pattern of variable risk orientation (X_{11}) shows that the minimum range of the risk orientation is 1 and the maximum range is 7. The mean risk orientation value is 4.074 with a standard deviation of 1.5304. The coefficient of variance (CV) is 37.56505% which indicates that the distribution of variable is consistent.

The distribution pattern of variable index of farm mechanization (X_{12}) shows that the minimum range is 20 while the maximum range is 96. The mean index of farm mechanization is 50.52 with a standard deviation of 19.39458. The coefficient of variance (CV) is 38.3899% which indicate that the distribution of variable is consistent.

The distribution pattern of variable cropping intensity (X_{13}) shows that the minimum range is 42.92 while the maximum range is 200. The mean cropping intensity is 95.3743 with a standard deviation of 32.05064. The coefficient of variance (CV) is 33.60512% which indicate that the distribution of variable is consistent.

The distribution pattern of variable selling% (X_{14}) shows that the minimum range is 45 while the maximum range is 95.7. Minimum range indicates that some of the respondents had selling their production with 45% while others had as many as 95.7 % .The mean selling% is 78.002 with a standard deviation of 10.93099. The coefficient of variance (CV) is 14.01373% which indicate that the distribution of variable is consistent.

The distribution pattern of variable debt (X_{15}) shows that the minimum range is 0 while the maximum range is 1. Minimum range indicates that some of the respondents do not have any type debt while some of the respondents having debt which they had taken from the bank or any other financial agencies for their cultivation practices. The mean value of debt is 0.7 with a standard deviation of 0.458258. The coefficient of variance (CV) is 65.46537% which indicate that the distribution of variable is consistent.

The distribution pattern of variable migration (X_{16}) shows that the minimum range is 0 while the maximum range is 1. Minimum range indicates that some of the respondents do not want to migrate from one place to another place while some of the respondents want to migrate from one place to another place due to highly impact of climate change on their net return from rice production. The mean value of migration is 0.12 with a standard deviation of 0.324962. The coefficient of variance (CV) is 270.8016% which indicate that the distribution of variable is consistent.

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The distribution pattern of variable mass media exposure (X_{17}) shows that some of the respondents had a media exposure as low as 0.33 while others had as high as 3.33. The mean value is 1.6104 with a standard deviation of 0.669193. The coefficient of variance (CV) is 41.55448% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable utilization of personal cosmopolite sources of information (X_{18}) shows that some of the respondents had a utilization of personal cosmopolite sources of information as low as 0.2 while others had as high as 3. The mean value is 1.52 with a standard deviation of 0.789937. The coefficient of variance (CV) is 51.96952% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable utilization of personal localite sources of information (X_{19}) shows that some of the respondents had a utilization of personal localite sources of information as low as 0.25 while others had as high as 3. The mean value is 1.694 with a standard deviation of 0.769717. The coefficient of variance (CV) is 45.43783% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable contact with extension personal (X_{20}) shows that some of the respondents had a contact with extension personal as low as 0.14 while others had as high as 3.71. The mean value is 1.6409 with a standard deviation of 0.923372. The coefficient of variance (CV) is 56.2723% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable seed rate% (X_{21}) shows that some of the respondents had a seed rate % as low as 90% while others had as high as 157.5% as per the recommended seed rate is 40 Kg/h. The mean value is 119.35 with a standard deviation of 16.90643. The coefficient of variance (CV) is 14.16542% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable fertilizer% (X_{22}) shows that some of the respondents had a fertilizer % as low as 53.3 % while others had as high as 133.3% as per the state govt. recommended fertilizer dose is (100 kg N, 50 Kg P, & 50 Kg K/h.). The mean value is 96.212 with a standard deviation of 18.68361. The coefficient of variance (CV) is 19.41921% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable pesticide% (X_{23}) shows that some of the respondents had a pesticide % as low as 33.3% while others had as high as 400% as per the state govt. recommended pesticide dose is (Fungicide-Tricyclazole WP 75-0.6g/litre).The mean value is 149.747 with a standard deviation of 73.87725. The coefficient of variance (CV) is 49.33471% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable weed management% (X_{24}) shows that some of the respondents had a weed management% as low as 53.3% while others had as high as 186.6% as per the state govt. recommended herbicide dose is 1.5 kg (a.i.) per hectare. The mean value is 107.885 with a standard deviation of

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27.84443. The coefficient of variance (CV) is 25.80936% which indicates that the distribution of the variable is consistent

The distribution pattern of variable water management% (X_{25}) shows that some of the respondents had a water management% as low as 0% while others had as high as 104% as per the state govt. recommended water management required in every crop growth stages. Zero indicate that some of the respondents do not have the irrigation sources and fully dependent on rainfall. The mean value is 58.62 with a standard deviation of 38.04465. The coefficient of variance (CV) is 64.90047% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable irrigation index (X_{26}) shows that some of the respondents had an irrigation index as low as 0 % while others had as high as 88.7%. Zero indicates that some of the respondents do not have the irrigation sources. The mean value is 39.338 with a standard deviation of 29.16121. The coefficient of variance (CV) is 74.12987% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable sowing time (X_{27}) shows that some of the respondents had a sowing time as low as 1 while others had as high as 4. Rank 1 indicates the sowing time is in between 15 June to 25 June while rank 4 indicates the sowing time is in between 16 July to 25 July. The mean value is 2.21 with a standard deviation of 1.210744. The coefficient of variance (CV) is 54.78478% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable varietal change (X_{28}) shows that some of the respondents had a varietal change as low as 0 % while others had as high as 1. Zero indicates that some of the respondents had been changed the variety every year due to any other reason while 1 indicates that some of the respondents had been changed the variety every year due to climate change. The mean value is 0.58 with a standard deviation of 0.493559. The coefficient of variance (CV) is 85.09629% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable farm power (X_{29}) shows that some of the respondents had a farm power as low as 0% while others had as high as 6. Zero indicates that some of the respondents do not have the draught animal while 6 indicate as high as 5-6 draught animals. The mean value is 3.22 with a standard deviation of 1.997899. The coefficient of variance (CV) is 62.04655% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable change in rainfall pattern over last 20 year (X_{30}) shows that some of the respondents had a change in rainfall pattern over last 20 year as low as 1 while others had as high as 10. Rank 1 & 10 indicates the respondent response over the change in rainfall pattern for minimum (1) and maximum (10) in 0-10 scale. The mean value is 7.11 with a standard deviation of 2.622575. The coefficient of variance (CV) is 36.88573% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable change pattern in temperature (day/night) over last 20 year (X_{31}) shows that some of the respondents had a change pattern in temperature (day/night) over last 20 year as low as 1 while others had as high as 10. Rank 1 & 10 indicates the respondent response over the change pattern in temperature (day/night) for minimum (1) and maximum (10) in 0-10 scale. The mean value is 6.85 with a standard deviation of 2.562713. The coefficient of variance (CV) is 37.41187% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable change pattern in weather disaster over last 20 year (X_{32}) shows that some of the respondents had a change pattern in weather disaster over last 20 year as low as 1 while others had as high as 10. Rank 1 & 10 indicates the respondent response over the change pattern in weather disaster for minimum (1) and maximum (10) in 0-10 scale. The mean value is 6.61 with a standard deviation of 2.568638. The coefficient of variance (CV) is 38.85988% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable change in seasonal pattern over last 20 year (X_{33}) shows that some of the respondents had a change in seasonal pattern over last 20 year as low as 1 while others had as high as 10. Rank 1 & 10 indicates the respondent response over the change in seasonal pattern for minimum (1) and maximum (10) in 0-10 scale. The mean value is 6.55 with a standard deviation of 2.471336. The coefficient of variance (CV)

is 37.73032% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable change pattern in insect/ pests & diseases over last 20 year (X_{34}) shows that some of the respondents had a change pattern in insect/ pests & diseases over last 20 year as low as 2 while others had as high as 10. Rank 1 & 10 indicates the respondent response over the change pattern in insect/ pests & diseases for minimum level (1) and maximum level (10) in 0-10 scale. The mean value is 7.59 with a standard deviation of 1.918828. The coefficient of variance (CV) is 25.281% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable change pattern in weed problem over last 20 year (X_{35}) shows that some of the respondents had a change pattern in weed problem over last 20 year as low as 1 while others had as high as 10. Rank 1 & 10 indicates the respondent response over the change pattern in weed problem for minimum level (1) and maximum level 10 in 0-10 scales. The mean value is 5.79 with a standard deviation of 2.016408. The coefficient of variance (CV) is 34.82569% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable net return from rice (Y_1) shows that some of the respondents had a net return from rice as low as -13700 while others had as high as 72500. Negative sign is for fully loss in rice production due to climate change. The mean value is 4404.62 with a standard deviation of 14963.82.

The coefficient of variance (CV) is 339.7301% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable expenditure on health care (Y_2) shows that some of the respondents had expenditure on health care as low as 140 while others had as high as 5500. The mean value is 1281.17 with a standard deviation of 810.5059. The coefficient of variance (CV) is 63.26.26294% which indicates that the distribution of the variable is consistent.

Table 6.12: Descriptive analysis of the independent and dependent variables (SRI) System of rice intensification method

Descriptive statistics						
Variables	**N**	**Minimum**	**Maximum**	**Mean**	**Std. deviation**	**CV (%)**
Age (X_1)	100	41	78	56.15	9.83	17.51
Education (X_2)	100	0	16	8.42	4.03	47.90
Family education status (X_3)	100	1	4.75	2.70	0.98	36.17
Primary occupation (X_{41})	100	1	6	4.04	1.44	35.68
Secondary occupation (X_{42})	100	0	5	3.47	2.04	58.84
Caste (X_5)	100	1	4	2.61	1.09	41.58
Family type(X_6)	100	1	2	1.46	0.50	34.14

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Family size(X_7)	100	2	13	6.02	2.87	47.74
Family income primary (X_{81})	100	219.85	13864.3	4543.62	3424.09	75.36
Family income secondary (X_{82})	100	0	8533.33	803.15	1183.27	147.33
Farm size (X_9)	100	0.4	6.87	2.27	1.55	68.55
Social participation (X_{10})	100	0	4	1.40	1.36	96.89
Risk orientation (X_{11})	100	1	7	3.79	1.99	52.57
Index of farm mechanization (X_{12})	100	24	98	58.08	19.83	34.15
Cropping intensity (X_{13})	100	50	175.7	98.02	27.50	28.06
Selling% (X_{14})	100	40	93.8	75.63	13.29	17.57
Debt (X_{15})	100	0	1	0.79	0.41	51.56
Migration (X_{16})	100	0	1	0.08	0.27	337.5
Mass media exposure (X_{17})	100	0.33	3.16	1.72	0.70	40.98
Utilization of personal cosmopolite sources of information (X_{18})	100	0.2	3	1.48	0.85	57.67

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Utilization of personal localite sources of information (X_{19})	100	0.25	3	1.61	0.83	51.67
Contact with extension personal (X_{20})	100	0.14	3.42	1.40	0.76	53.95
Seed rate% (X_{21})	100	100	480	221.00	96.27	43.56
Fertilizer% (X_{22})	100	53.3	130.3	94.60	15.45	16.33
Pesticide% (X_{23})	100	70	240	116.70	36.53	31.30
Weed management % (X_{24})	100	72.6	193.3	110.668	25.43	22.99
Water management % (X_{25})	100	62.5	125	95.02	13.27	13.96
Irrigation index% (X_{26})	100	40	100	85.79	13.82	16.11
Sowing time (X_{27})	100	1	3	1.92	0.82	42.75
Varietal change (X_{28})	100	0	1	0.64	0.48	75.00

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Descriptive statistics						
Variables	**N**	**Minimum**	**Maximum**	**Mean**	**Std. deviation**	**CV (%)**
Farm power (X_{29})	100	0	6	2.70	2.01	74.35
Change in rainfall pattern over last 20 year (X_{30})	100	1	10	7.01	2.16	30.83
Change pattern in temperature (day/night) over last 20 year (X_{31})	100	1	10	6.27	2.22	35.44
Change pattern in weather disaster over last 20 year (X_{32})	100	1	10	6.09	2.36	38.79
Change in seasonal pattern over last 20 year (X_{33})	100	1	10	6.11	2.39	39.14
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	100	2	10	8.01	2.28	28.44

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Change pattern in weed problem over last 20 year (X_{35})	100	4	10	8.49	1.57	18.51
Net return from rice(Y_1)	100	-4600	120000	36830.22	28804.87	78.21
Expenditure on health care (Y_2)	100	112.5	3125	1064.42	482.45	45.33

Table 6.12, it presents the descriptive analysis on the distribution nature of different independent and dependent variables.

The distribution pattern of variable age (X_1) depicts that the minimum age of the respondents was 41 and the maximum was 78. Since the age of the respondents had not been pre-categorized or pre-specified, the distribution of the age was quite natural. The mean age is 56.15 with a standard deviation of 9.83.The coefficient of variance (CV) has been 17.51% which indicates that the distribution of the variable has been quite consistent.

The distribution pattern of variable education (X_2) shows the minimum education level is 0 while the maximum is 16. This shows that some of the respondents are illiterate who do not study at all while others studied as high as graduate and above. The mean education is 8.42 with a standard deviation of 4.03.

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The coefficient of variance (CV) is 47.90% which indicates that the distribution of variable is consistent.

The distribution pattern of variable family education status (X_3) shows that the minimum rank is 1 while the maximum rank is 4.75. This indicates that overall family education status. It shows the minimum education level is from illiterate to graduate and above. The mean family education status is 2.70 with a standard deviation of 0.98. The coefficient of variance (CV) is 36.17% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable primary occupation (X_{41}) shows that the minimum rank is 1 while the maximum rank is 6. This indicates that farmer is minimum labour (1) and maximum doing service (6).The mean primary occupation is 4.04 with the standard deviation of 1.44. The coefficient of variance (CV) is 35.68% which indicates that the distribution of variable is consistent.

The distribution pattern of variable secondary occupation (X_{42}) shows that the minimum rank is (0) while the maximum rank is (5). The zero indicates that farmer is not doing any other occupation and 5 indicate that maximum he is doing cultivation. The mean secondary occupation is 3.47 with the standard deviation of 2.04. The coefficient of variance (CV) is 58.84% which indicates that the distribution of variable is consistent.

The distribution pattern of variable Caste (X_5) shows that the minimum caste of farmer is (1) which means scheduled tribe

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category while the maximum caste of farmer is (4) which mean having general caste category. The mean caste is 2.61 with the standard deviation of 1.09. The coefficient of variance (CV) is 41.58% which indicates that the distribution of variable is consistent.

The distribution pattern of variable family type (X_6) shows that the minimum family type is 1 while the maximum family type is 2. The mean family type is 1.46 with the standard deviation of 0.50. The coefficient of variance (CV) is 34.14% which indicates that the distribution of variable is consistent.

The distribution pattern of variable family size (X_7) shows that the minimum family size is 2 while the maximum family size is 13. The mean family size is 6.02 with the standard deviation of 2.87. The coefficient of variance (CV) is 47.74% which indicates that the distribution of variable is consistent.

The distribution pattern of variable family income primary (X_{81}) shows that the minimum primary income of the respondent is as low as 219.85 while the maximum is as high as 13864.3. The mean primary income is 4543.62 with a standard deviation of 3424.09 .The coefficient of variance (CV) is 75.36% which indicates that the distribution of variable is consistent.

The distribution pattern of variable family income secondary (X_{82}) shows that the minimum secondary income of the respondent is as low as 0 while the maximum is as high as 8533.33. The mean secondary income is 803.15 with a standard

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deviation of 1183.27. The coefficient of variance (CV) is 147.33% which indicates that the distribution of variable is consistent.

The distribution pattern of variable farm size (X_9) shows that the minimum farm size of the respondent is as low as 0.4 while the maximum is as high as 6.87 hectare. The mean farm size is 2.27 with a standard deviation of 1.55.The coefficient of variance (CV) is 68.55% which indicates that the distribution of variable is consistent.

The distribution pattern of variable social participation (X_{10}) shows that the minimum range is 0 while the maximum range is 4. Zero indicates that some of the respondents had no any social participation while others had as many as wider public leaders. The mean social participation is 1.40 with a standard deviation of 1.36. The coefficient of variance (CV) is 96.89% which indicate that the distribution of variable is consistent.

The distribution pattern of variable risk orientation (X_{11}) shows that the minimum range of the risk orientation is 1 and the maximum range is 7. The mean risk orientation value is 3.79 with a standard deviation of 1.99. The coefficient of variance (CV) is 52.57% which indicates that the distribution of variable is consistent.

The distribution pattern of variable index of farm mechanization (X_{12}) shows that the minimum range is 24 while the maximum range is 98.the mean index of farm mechanization is 58.08 with a standard deviation of 19.83. The coefficient of

variance (CV) is 34.15% which indicate that the distribution of variable is consistent.

The distribution pattern of variable cropping intensity (X_{13}) shows that the minimum range is 50 while the maximum range is 175.7. The mean cropping intensity is 98.02 with a standard deviation of 27.50. The coefficient of variance (CV) is 28.06% which indicate that the distribution of variable is consistent.

The distribution pattern of variable selling% (X_{14}) shows that the minimum range is 40 while the maximum range is 93.8. Minimum range indicates that some of the respondents had selling their production with 40% while others had as many as 93.8% .The mean selling% is 75.63 with a standard deviation of 13.29. The coefficient of variance (CV) is 17.57% which indicate that the distribution of variable is consistent.

The distribution pattern of variable debt (X_{15}) shows that the minimum range is 0 while the maximum range is 1. Minimum range indicates that some of the respondents do not have any type debt while some of the respondents having debt which they had taken from the bank or any other financial agencies for their cultivation practices. The mean value of debt is 0.79 with a standard deviation of 0.41. The coefficient of variance (CV) is 51.56% which indicate that the distribution of variable is consistent.

The distribution pattern of variable migration (X_{16}) shows that the minimum range is 0 while the maximum range is 1. Minimum range indicates that some of the respondents do not want to

migrate from one place to another place while some of the respondents want to migrate from one place to another place due to highly impact of climate change on their net return from rice production. The mean value of migration is 0.08 with a standard deviation of 0.27. The coefficient of variance (CV) is 337.5% which indicate that the distribution of variable is consistent.

The distribution pattern of variable mass media exposure (X_{17}) shows that some of the respondents had a media exposure as low as 0.33 while others had as high as 3.16. The mean value is 1.72 with a standard deviation of 0.70. The coefficient of variance (CV) is 40.98% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable utilization of personal cosmopolite sources of information (X_{18}) shows that some of the respondents had a utilization of personal cosmopolite sources of information as low as 0.2 while others had as high as 3. The mean value is 1.48 with a standard deviation of 0.85. The coefficient of variance (CV) is 57.67% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable utilization of personal localite sources of information (X_{19}) shows that some of the respondents had a utilization of personal localite sources of information as low as 0.25 while others had as high as 3. The mean value is 1.61 with a standard deviation of 0.83. The coefficient of variance (CV) is 51.67% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable contact with extension personal (X_{20}) shows that some of the respondents had a contact with extension personal as low as 0.14 while others had as high as 3.42. The mean value is 1.40 with a standard deviation of 0.76. The coefficient of variance (CV) is 53.95% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable seed rate% (X_{21}) shows that some of the respondents had a seed rate% as low as 100% while others had as high as 480% as per the recommended seed rate is 5 Kg/h. The mean value is 221.00 with a standard deviation of 96.27. The coefficient of variance (CV) is 43.56% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable fertilizer% (X_{22}) shows that some of the respondents had a fertilizer% as low as 53.3% while others had as high as 130.3% as per the state govt. it required 8 to 10 metric tonne organic manure/ hectare before puddling in the field. 3kg azospyrilym/ hectare and another use of green manuring crop- *Subabul, dhencha, boru* etc. If it is not possible then use 50 % green manuring and 50 % recommended dose of N, P & k. (100:5050).The mean value is 94.60 with a standard deviation of 15.45. The coefficient of variance (CV) is 16.33% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable pesticide% (X_{23}) shows that some of the respondents had a pesticide% as low as 70 % while others had as high as 240 % as per the state govt. recommended pesticide dose is (Insecticide-Carbofuron 3g @

1kg (a.i) per hectare. The mean value is 116.70 with a standard deviation of 36.53. The coefficient of variance (CV) is 31.30% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable weed management% (X_{24}) shows that some of the respondents had a weed management% as low as 72.6% while others had as high as 193.3% as per the state govt. recommended herbicide dose is 1.5 kg (a.i.) per hectare. The mean value is 110.668 with a standard deviation of 25.43. The coefficient of variance (CV) is 22.99% which indicates that the distribution of the variable is consistent

The distribution pattern of variable water management% (X_{25}) shows that some of the respondents had a water management% as low as 62.5% while others had as high as 125% as per the state govt. recommended water management required in every crop growth stages. The mean value is 95.02 with a standard deviation of 13.27. The coefficient of variance (CV) is 13.96% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable irrigation index (X_{26}) shows that some of the respondents had an irrigation index as low as 40% while others had as high as 100%. The mean value is 85.79 with a standard deviation of 13.82. The coefficient of variance (CV) is 16.11% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable sowing time (X_{27}) shows that some of the respondents had a sowing time as low as 1 while others had as high as 3. Rank 1 indicates the sowing time is

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in between 15 July to 23 July while rank 3 indicates the sowing time is in between 1 August to 8 August. The mean value is 1.92 with a standard deviation of 0.82. The coefficient of variance (CV) is 42.75% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable varietal change (X_{28}) shows that some of the respondents had a varietal change as low as 0% while others had as high as 1. Zero indicates that some of the respondents had been changed the variety every year due to any other reason while 1 indicates that some of the respondents had been changed the variety every year due to climate change. The mean value is 0.64 with a standard deviation of 0.48. The coefficient of variance (CV) is 75.00% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable farm power (X_{29}) shows that some of the respondents had a farm power as low as 0% while others had as high as 6. Zero indicates that some of the respondents do not have the draught animal while 6 indicate as high as 5-6 draught animals. The mean value is 2.70 with a standard deviation of 2.01. The coefficient of variance (CV) is 74.35% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable change in rainfall pattern over last 20 year (X_{30}) shows that some of the respondents had a change in rainfall pattern over last 20 year as low as 1 while others had as high as 10. Rank 1 & 10 indicates the respondent

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response over the change in rainfall pattern for minimum (1) and maximum (10) in 0-10 scale. The mean value is 7.01 with a standard deviation of 2.16. The coefficient of variance (CV) is 30.83% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable change pattern in temperature (day/night) over last 20 year (X_{31}) shows that some of the respondents had a change pattern in temperature (day/night) over last 20 year as low as 1 while others had as high as 10. Rank 1 & 10 indicates the respondent response over the change pattern in temperature (day/night) for minimum (1) and maximum (10) in 0-10 scale. The mean value is 6.27 with a standard deviation of 2.22. The coefficient of variance (CV) is 35.44% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable change pattern in weather disaster over last 20 year (X_{32}) shows that some of the respondents had a change pattern in weather disaster over last 20 year as low as 1 while others had as high as 10. Rank 1 & 10 indicates the respondent response over the change pattern in weather disaster for minimum (1) and maximum (10) in 0-10 scale. The mean value is 6.09 with a standard deviation of 2.36. The coefficient of variance (CV) is 38.79% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable change in seasonal pattern over last 20 year (X_{33}) shows that some of the respondents had a

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change in seasonal pattern over last 20 year as low as 1 while others had as high as 10. Rank 1 & 10 indicates the respondent response over the change in seasonal pattern for minimum (1) and maximum (10) in 0-10 scale. The mean value is 6.11 with a standard deviation of 2.39. The coefficient of variance (CV) is 39.14% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable Change pattern in insect/ pests & diseases over last 20 year (X_{34}) shows that some of the respondents had a change pattern in insect/ pests & diseases over last 20 year as low as 2 while others had as high as 10. Rank 1 & 10 indicates the respondent response over the change pattern in insect/ pests & diseases for minimum level (2) and maximum level (10) in 0-10 scale. The mean value is 8.01 with a standard deviation of 2.28. The coefficient of variance (CV) is 28.44% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable change pattern in weed problem over last 20 year (X_{35}) shows that some of the respondents had a change pattern in weed problem over last 20 year as low as 4 while others had as high as 10. The mean value is 8.49 with a standard deviation of 1.57. The coefficient of variance (CV) is 18.51% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable net return from rice (Y_1) shows that some of the respondents had a net return from rice as

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low as -4600 while others had as high as 120000.The mean value is 36830.22 with a standard deviation of 28804.87. The coefficient of variance (CV) is 78.21% which indicates that the distribution of the variable is consistent.

The distribution pattern of variable expenditure on health care (Y_2) shows that some of the respondents had expenditure on health care as low as 112.5 while others had as high as 3125. The mean value is 1064.42 with a standard deviation of 482.45. The coefficient of variance (CV) is 45.33% which indicates that the distribution of the variable is consistent.

Table 6.13: Co-efficient of correlation: Net return from rice (y_1) vrs.35 predictor variables. (Conventional method of rice)

Variables	r value	Remarks
Age(X_1)	-0.1005	
Education (X_2)	0.2067	*
Family education status (X_3)	-0.1113	
Primary occupation (X_{41})	0.1442	
Secondary occupation (X_{42})	-0.3941	**
Caste (X_5)	0.1450	
Family type(X_6)	0.1131	
Family size (X_7)	0.1508	
Family income primary (X_{81})	0.1132	
Family income secondary (X_{82})	0.0010	
Farm size(X_9)	0.3499	**
Social participation (X_{10})	0.2223	*
Risk orientation (X_{11})	0.1937	
Index of farm mechanization (X_{12})	0.0069	
Cropping intensity (X_{13})	-0.0296	
Selling% (X_{14})	0.1717	
Debt (X_{15})	-0.1431	
Migration (X_{16})	-0.2450	*

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Mass media exposure (X_{17})	0.0004	
Utilization of personal cosmopolite sources of information (X_{18})	0.0676	
Utilization of personal localite sources of information (X_{19})	0.1146	
Contact with extension personal (X_{20})	0.1693	
Seed rate% (X_{21})	-0.0998	
Fertilizer% (X_{22})	0.0579	
Pesticide% (X_{23})	0.0394	
Weed management%(X_{24})	0.2122	*
Water management% (X_{25})	0.3430	**
Irrigation index% (X_{26})	0.3819	**
Sowing time (X_{27})	0.0269	

Variables	R value	Remarks
Age(X_1)	0.014	
Education((X_2)	0.072	
Family Education Status (X_3)	0.051	
Primary Occupation (X_{41})	-0.009	
Secondary Occupation(X_{42})	0.156	*
Caste (X_5)	-0.009	
Family Type(X_6)	-0.057	
Family Size(X_7)	0.078	
Family Income Primary(X_{81})	0.069	
Family Income Secondary (X_{82})	0.056	
Farm Size(X_9)	-0.051	
Social Participation(X_{10})	-0.081	
Risk Orientation (X_{11})	0.021	
Index of Farm Mechanization (X_{12})	-0.072	
Cropping Intensity (X_{13})	0.104	
Selling %(X_{14})		
Debt (X_{15})		
Migration (X_{16})		
Mass Media Exposure(X_{17})		
Utilization of Personal Cosmopolite Sources of Information (X_{18})		

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Utilization of Personal Localite Sources of Information(X_{19})		
Contact with Extension Personal(X_{20})		
Seed Rate %(X_{21})		
Fertilizer %(X_{22})		
Pesticide% (X_{23})		
Weed Management%(X_{24})		
Water Management%(X_{25})		
Irrigation Index%(X_{26})		
Sowing Time(X_{27})		

Varietal change (X_{28})	-0.2043	*
Farm power (X_{29})	-0.0041	
Change in rainfall pattern over last 20 year (X_{30})	0.0346	
Change pattern in temperature (day/night) over last 20 year (X_{31})	0.1056	
Change pattern in weather disaster over last 20 year (X_{32})	-0.1088	
Change in seasonal pattern over last 20 year (X_{33})	-0.0554	
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	-0.0745	
Change pattern in weed problem over last 20 year (X_{35})	0.0495	

** Significant at 1 % level of significance

* Significant at 5 % level of significance

Discussion

Table 6.13, it presents the correlation between net return from rice (Y_1) and 35 independent variables. It has been found that the variable, farm size, water management%, irrigation index% has recorded a significant and positive correlation with the dependent

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variable net return from rice with 1% level of significance, while the variable secondary occupation has recorded a significant and negative correlation with the dependent variable net return from rice with 1% level of significance.

The variable education, social participation, weed management% has recorded a significant and positive correlation with the dependent variable net return from rice with 5% level of significance, while the variable migration, varietal change has recorded a significant and negative correlation with the dependent variable net return from rice with 5% level of significance.

Table 6.14: Co-efficient of correlation: Expenditure on health care (y_2) vrs.35 predictor variables. (Conventional method of rice)

Variables	r value	Remarks
Age (X_1)	-0.0502	
Education (X_2)	-0.0942	
Family education status (X_3)	**0.2991**	**
Primary occupation (X_{41})	0.0714	
Secondary occupation (X_{42})	0.0133	
Caste (X_5)	-0.0758	
Family type (X_6)	**-0.4848**	**
Family size (X_7)	**-0.5437**	**
Family income primary (X_{81})	0.0450	
Family income secondary (X_{82})	0.0275	
Farm size(X_9)	-0.0470	
Social participation (X_{10})	-0.1162	
Risk orientation (X_{11})	0.1621	

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Index of farm mechanization (X_{12})	-0.0995	
Cropping intensity (X_{13})	-0.1110	
Selling% (X_{14})	-0.0549	
Debt (X_{15})	0.0990	
Migration (X_{16})	0.1027	
Mass media exposure (X_{17})	-0.0679	
Utilization of personal cosmopolite sources of information (X_{18})	-0.1531	
Utilization of personal localite sources of information (X_{19})	0.0679	
Contact with extension personal (X_{20})	0.0196	
Seed rate% (X_{21})	0.0291	
Fertilizer% (X_{22})	0.1215	
Pesticide% (X_{23})	0.1280	
Weed management% (X_{24})	-0.1395	
Water management% (X_{25})	-0.1582	
Irrigation index% (X_{26})	-0.1584	
Sowing time (X_{27})	-0.0132	

Variables	**R value**	**Remarks**
Age(X_1)	0.014	
Education((X_2)	0.072	
Family Education Status (X_3)	0.051	
Primary Occupation (X_{41})	-0.009	
Secondary Occupation(X_{42})	0.156	*
Caste (X_5)	-0.009	
Family Type(X_6)	-0.057	
Family Size(X_7)	0.078	
Family Income Primary(X_{81})	0.069	
Family Income Secondary (X_{82})	0.056	
Farm Size(X_9)	-0.051	
Social Participation(X_{10})	-0.081	

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Risk Orientation (X_{11})	0.021	
Index of Farm Mechanization (X_{12})	-0.072	
Cropping Intensity (X_{13})	0.104	
Selling %(X_{14})		
Debt (X_{15})		
Migration (X_{16})		
Mass Media Exposure(X_{17})		
Utilization of Personal Cosmopolite Sources of Information (X_{18})		
Utilization of Personal Localite Sources of Information(X_{19})		
Contact with Extension Personal(X_{20})		
Seed Rate %(X_{21})		
Fertilizer %(X_{22})		
Pesticide% (X_{23})		
Weed Management%(X_{24})		
Water Management%(X_{25})		
Irrigation Index%(X_{26})		
Sowing Time(X_{27})		

Varietal change (X_{28})	-0.0759	
Farm power (X_{29})	0.1321	
Change in rainfall pattern over last 20 year (X_{30})	0.0597	
Change pattern in temperature (day/night) over last 20 year (X_{31})	-0.1350	
Change pattern in weather disaster over last 20 year (X_{32})	0.0446	
Change in seasonal pattern over last 20 year (X_{33})	-0.0148	
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	0.0235	
Change pattern in weed problem over last 20 year (X_{35})	-0.0865	

** Significant at 1 % level of significance

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Discussion:

Table 6.14, it presents the correlation between expenditure on health care (Y_2) and 35 independent variables. It has been found that the variable family education status has recorded a significant and positive correlation with the dependent variable expenditure on health care (Y_2) with 1% level of significance, while the variable family type and family size has recorded a significant and negative correlation with the dependent variable expenditure on health care (Y_2) with 1% level of significance.

Table 6.15: Co-efficient of correlation: Net return from rice (y_1) vrs.35 predictor variables. (SRI method of rice)

Variables	r value	Remarks
Age (X_1)	-0.2768	*
Education (X_2)	0.1731	
Family education status (X_3)	0.0858	
Primary occupation (X_{41})	0.3312	**
Secondary occupation (X_{42})	-0.2665	**
Caste (X_5)	0.1262	
Family type(X_6)	-0.0523	
Family size (X_7)	-0.0320	
Family income primary (X_{81})	0.4172	**
Family income secondary (X_{82})	0.0740	
Farm size (X_9)	0.8902	**
Social participation (X_{10})	0.0336	
Risk orientation (X_{11})	0.1481	
Index of farm mechanization (X_{12})	-0.0198	
Cropping intensity (X_{13})	-0.2767	**
Selling% (X_{14})	-0.1215	
Debt (X_{15})	-0.1764	
Migration (X_{16})	-0.3646	**
Mass media exposure (X_{17})	0.1880	

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Utilization of personal cosmopolite sources of information (X_{18})	0.0033	
Utilization of personal localite sources of information (X_{19})	-0.1826	
Contact with extension personal (X_{20})	0.1014	
Seed rate% (X_{21})	0.0547	
Fertilizer% (X_{22})	-0.0298	
Pesticide% (X_{23})	-0.0974	
Weed management% (X_{24})	0.2064	*
Water management% (X_{25})	-0.1018	
Irrigation index% (X_{26})	0.0169	
Sowing time (X_{27})	0.0873	

Variables	**R value**	**Remarks**
Age(X_1)	0.014	
Education((X_2)	0.072	
Family Education Status (X_3)	0.051	
Primary Occupation (X_{41})	-0.009	
Secondary Occupation(X_{42})	0.156	*
Caste (X_5)	-0.009	
Family Type(X_6)	-0.057	
Family Size(X_7)	0.078	
Family Income Primary(X_{81})	0.069	
Family Income Secondary (X_{82})	0.056	
Farm Size(X_9)	-0.051	
Social Participation(X_{10})	-0.081	
Risk Orientation (X_{11})	0.021	
Index of Farm Mechanization (X_{12})	-0.072	
Cropping Intensity (X_{13})	0.104	
Selling %(X_{14})		
Debt (X_{15})		
Migration (X_{16})		
Mass Media Exposure(X_{17})		

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Utilization of Personal Cosmopolite Sources of Information (X_{18})		
Utilization of Personal Localite Sources of Information(X_{19})		
Contact with Extension Personal(X_{20})		
Seed Rate %(X_{21})		
Fertilizer %(X_{22})		
Pesticide% (X_{23})		
Weed Management%(X_{24})		
Water Management%(X_{25})		
Irrigation Index%(X_{26})		
Sowing Time(X_{27})		

Varietal change (X_{28})	-0.1596	
Farm power (X_{29})	-0.1147	
Change in rainfall pattern over last 20 year (X_{30})	-0.1821	
Change pattern in temperature (day/night) over last 20 year (X_{31})	0.0692	
Change pattern in weather disaster over last 20 year (X_{32})	0.1240	
Change in seasonal pattern over last 20 year (X_{33})	-0.1564	
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	-0.0372	
Change pattern in weed problem over last 20 year (X_{35})	-0.0525	

** Significant at 1 % level of significance

* Significant at 5 % level of significance

Discussion:

Table 6.15, It presents the correlation between net return from rice (Y_1) and 35 independent variables. It has been found that the variable primary occupation, family income primary, farm size,

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has recorded a significant and positive correlation with the dependent variable net return from rice with 1% level of significance, while the variable secondary occupation, cropping intensity, migration has recorded a significant and negative correlation with the dependent variable net return from rice with 1% level of significance.

The variable weed management% has recorded a significant and positive correlation with the dependent variable net return from rice (Y_1) with 5% level of significance**,** while the variable age has recorded a significant and negative correlation with the dependent variable net return from rice (Y_1) with 5% level of significance.

Table 6.16: Co-efficient of correlation: Expenditure on health (y_2) vrs.35 predictor variables. (SRI method of rice)

Variables	r value	Remarks
Age (X_1)	0.2576	*
Education (X_2)	0.0341	
Family education status (X_3)	0.2994	**
Primary occupation (X_{41})	-0.1650	
Secondary occupation(X_{42})	0.2630	**
Caste (X_5)	-0.1397	
Family type (X_6)	-0.4842	**
Family size (X_7)	-0.4916	**
Family income primary (X_{81})	0.2504	*
Family income secondary (X_{82})	0.1246	
Farm size (X_9)	-0.1247	
Social participation (X_{10})	0.0224	
Risk orientation (X_{11})	-0.0099	
Index of farm mechanization (X_{12})	0.0028	
Cropping intensity (X_{13})	-0.2176	*

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Selling% (X_{14})	0.0614	
Debt (X_{15})	-0.0440	
Migration (X_{16})	0.0548	
Mass media exposure (X_{17})	0.0870	
Utilization of personal cosmopolite sources of information (X_{18})	-0.0669	
Utilization of personal localite sources of information (X_{19})	-0.1396	
Contact with extension personal (X_{20})	-0.1054	
Seed rate% (X_{21})	-0.1546	
Fertilizer% (X_{22})	-0.0736	
Pesticide% (X_{23})	-0.0519	
Weed management% (X_{24})	-0.0992	
Water management% (X_{25})	-0.2268	*
Irrigation index% (X_{26})	0.0366	
Sowing time (X_{27})	0.0603	
Varietal change (X_{28})	-0.0704	
Farm power (X_{29})	-0.0410	
Change in rainfall pattern over last 20 year (X_{30})	-0.0611	
Change pattern in temperature (day/night) over Last 20 Year (X_{31})	0.2178	*
Change pattern in weather disaster over last 20 year (X_{32})	-0.1223	
Change in seasonal pattern over last 20 year (X_{33})	0.1246	
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	0.1064	
Change pattern in weed problem over last 20 year (X_{35})	0.0942	

** Significant at 1 % level of significance

* Significant at 5 % level of significance

Discussion:

Table 6.16, it presents the correlation between expenditure on health care (Y_2) and 35 independent variables. It has been found

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that the variable family education status, secondary occupation has recorded a significant and positive correlation with the dependent variable expenditure on health care (Y_2) with 1% level of significance, while the variable family type and family size has recorded a significant and negative correlation with the dependent variable expenditure on health care (Y_2) with 1% level of significance.

The variable age, family income primary, change pattern in temperature (day/night) over last 20 year has recorded a significant and positive correlation with the dependent variable expenditure on health care (Y_2) with 5% level of significance, while the variable cropping intensity, water management has recorded a significant and negative correlation with the dependent variable expenditure on health care (Y_2) with 5% level of significance

Table 6.17: Best fitted regression equation following stepwise model of multiple regression equation for selecting most significant variables having prominent regression impact on consequent variable Net return from rice (Y_1) and Expenditure on health care (Y_2).

(Conventional method of rice)						
Dependent variable(Y)	Regression equation(Step wise)	Variable	R^2	Adj. R^2	SE(est.)	Ranking of important dependent regressors

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Net return from rice (Y_1)	Y_1=-8213.66-2234.59X_{42}+186.38 X_{26} + 2604.81 X_{10} + 99.45 X_{24}	(X_{42})-Secondary occupation (X_{26})-Irrigation index% (X_{10})-Social participation (X_{24})-Weed management%	0.32	0.292	12657.83	Y_1=X_{42}>X_{26}>X_{10}>X_{24}
Expenditure on health care (Y_2)	Y_2=2120.71-159.21 X_7 +93.63 X_{11} – 0.064 X_{81}	(X_7)-Family size (X_{11})- Risk orientation (X_{81})-Family income primary	0.3355	0.335	664.33	Y_2=X_7>X_{11}>X_{81}

Two equations can identify the important predictors to explain Y for Conventional method of rice in the light of climate change.

Discussion:

Table 6.17, it concluded that net return from rice (Y_1) is explained by the variable irrigation index% (X_{26}), social participation (X_{10}) and the variable weed management% (X_{24}) with their positive contribution towards net return from rice (Y_1) in the light of climate change, while the variable secondary occupation (X_{42}) with its negative impact towards reducing the

magnitude of net return from rice (Y_1) in the light of climate change. Total variance explained by such equation is 32% and all predictors in this equation have resulted significant regression coefficient to explain net return from Rice (Y_1) in the light of climate change.

Then it can be further concluded that expenditure on health care (Y_2) is explained by the variable risk orientation (X_{11}) with their positive contribution towards expenditure on health care (Y_2) in the light of climate change, while the variable family size (X_7) and family income primary (X_{81}) with its negative impact towards reducing the magnitude of expenditure on health care (Y_2) in the light of climate change. Total variance explained by such equation is 35.50% and all predictors in this equation have resulted significant regression coefficient to explain expenditure on health care (Y_2) in the light of climate change.

Table 6.18: Best fitted regression equation following stepwise model of multiple regression equation for selecting most significant variables having prominent regression impact on consequent variable Net return from rice (Y_1) and Expenditure on health care (Y_2).

(System of rice intensification method)						
Dependent variable (Y)	**Regression equation(Stepwise)**	**Variable**	**R^2**	**Adj. R^2**	**SE(est.)**	**Ranking of important dependent regressors**

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Net return from Rice **(Y_1)**	Y_1=-4593.22+ 14811.56 X_9 - 15631 X_{16} + 1.14 X_{81} – 3252.32 X_{19}	(X_9)-Farm size (X_{16})-Migration (X_{81})-Family income primary (X_{19})-Utilization of personal localite sources of information	0.838	0.831	11891.36	$Y_1=X_9>X_{16}>X_{81}>X_{19}$
Expenditure on health Care **(Y_2)**	Y_2=1610.15 – 76.02 X_7 + 58.33 X_{42} – 2.96 X_{13}	(X_7)-Family size (X_{42})-Secondary occupation (X_{13})-Cropping intensity %	0.324	0.303	404.74	$Y_2=X_7>X_{42}>X_{13}$

Two equations can identify the important predictors to explain Y for System of rice Intensification method in the light of climate change.

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Discussion

Table 6.18, it concluded that net return from rice (Y_1) is explained by the variable farm size (X_9) and family income primary (X_{81}) with their positive contribution towards net return from rice (Y_1) in the light of climate change, while the variable migration (X_{16}) and utilization of personal localite sources of information (X_{19}) with its negative impact towards reducing the magnitude of net return from rice (Y_1) in the light of climate change. Total variance explained by such equation is 83.80% and all predictors in this equation have resulted significant regression coefficient to explain net return from rice (Y_1) in the light of climate change.

Then it can be further concluded that expenditure on health care (Y_2) is explained by the variable secondary occupation (X_{42}) with their positive contribution towards expenditure on health care (Y_2) in the light of climate change, while the variable family size (X_7) and cropping intensity% (X_{13}) with its negative impact towards reducing the magnitude of expenditure on health care (Y_2) in the light of climate change. Total variance explained by such equation is 32.40% and all predictors in this equation have resulted significant regression coefficient to explain expenditure on health care (Y_2) in the light of climate change.

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Table 6.19: Path analysis: direct, indirect and residual effect: exogenous variables (X_1-X_{35}) vs. Net return from rice (Y_1)

Conventional method of rice

Variables	Total Effect	Total Direct Effect	Total Indirect Effect	Substantial Indirect Effect		
				I	II	III
Age (X_1)	-0.101	-0.008	-0.093	0.050461 X_{22}	0.038142 X_{34}	0.024318 X_9
Education (X_2)	0.207	0.092	0.114	0.093507 X_{10}	0.079021 X_9	0.049161 X_{26}
Family education status (X_3)	-0.111	-0.034	-0.077	0.057898 X_6	0.047439 X_{26}	0.029053 X_{82}
Primary Occupation (X_{41})	0.144	-0.122	0.266	0.205419 X_{42}	0.092886 X_9	0.040631 X_6
Secondary occupation (X_{42})	-0.394	-0.344	-0.050	0.085102 X_{13}	0.072809 X_{41}	0.037559 X_{82}
Caste (X_5)	0.145	-0.017	0.162	0.034745 X_{10}	0.03067 X_{35}	0.025095 X_{13}
Family type(X_6)	0.113	-0.275	0.388	0.182845 X_7	0.058651 X_{31}	0.049156 x_{26}
Family Size (X_7)	0.151	0.207	-0.056	0.050021 X_{31}	0.042354 X_{81}	0.03618 X_{13}
Family income primary (X_{81})	0.113	-0.115	0.228	0.178556 X_9	0.091007 X_6	0.060692 X_{82}

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Family income secondary (X_{82})	0.001	0.119	-0.118	0.047749 X_{26}	0.034857 X_6	0.026017 X_{41}
Farm size (X_9)	0.350	0.385	-0.035	0.157644 X_{42}	0.047867 X_{10}	0.037771 x_{22}
Social participation (X_{10})	0.222	0.168	0.054	0.109359 X_9	0.051297 X2	0.040892 X_{42}
Risk orientation (X_{11})	0.194	0.066	0.128	0.08647 X_{26}	0.070288 X_{42}	0.054685 X_9
Index of farm mechanization (X_{12})	0.007	-0.221	0.227	0.164071 X_9	0.057954 X_{42}	0.032818 X_{17}
Cropping intensity (X_{13})	-0.030	0.283	-0.313	0.058998 X_{26}	0.049849 X_{12}	0.02796 X18
Selling% (X_{14})	0.172	0.116	0.056	0.069508 X_9	0.031568 X_7	0.026251 X_{26}
Debt (X_{15})	-0.143	-0.121	-0.022	0.030023 X_{31}	0.027022 X_{42}	0.019644 X_{10}
Migration (X_{16})	-0.245	0.075	-0.320	0.053516 X_{31}	0.042204 X_{81}	0.041259 X_{25}
Mass media exposure (X_{17})	0.000	-0.143	0.144	0.050577 X_{12}	0.039217 X_9	0.033267 X_{31}
Utilization of personal cosmopolite sources of information (X_{18})	0.068	0.239	-0.171	0.034258 X_{41}	0.033206 X_{13}	0.023246 X_{29}

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Variables	Total Effect	Total Direct Effect	Total Indirect Effect	Substantial indirect effect		
				I	II	III
Utilization of personal localite sources of information (X_{19})	0.248	0.145	0.103	0.089573 X_9	0.088865 X_{26}	0.083711 X_{42}
Contact with extension personal (X_{20})	0.169	0.187	-0.018	0.03722 X_7	0.029089 X_{31}	0.016912 X_2
Seed rate% (X_{21})	-0.100	-0.021	-0.079	0.025743 X_{17}	0.021779 X_{13}	0.016042 X_{29}
Fertilizer% (X_{22})	0.058	0.237	-0.179	0.061276 X_9	0.049328 X_6	0.033698 X_{42}
Pesticide% (X_{23})	0.039	0.189	-0.150	0.042549 X_6	0.031551 X_{12}	0.021048 X_{28}
Weed management% (X_{24})	0.212	0.089	0.123	0.093908 X_9	0.090732 X_{42}	0.029376 X_{22}
Water management% (X_{25})	0.343	-0.078	0.421	0.222624 X_{26}	0.124069 X_9	0.082328 X_{42}
Irrigation index% (X_{26})	0.382	0.303	0.079	0.068888 X_{42}	0.055177 X_{13}	0.045536 X_9
Sowing time (X_{27})	0.027	0.047	-0.020	0.042204 X_{26}	0.021819 X_{42}	0.017601 X_6
Varietal change (X_{28})	-0.204	-0.083	-0.121	0.033278 X_{18}	0.026904 X_{29}	0.026675 X_6
Farm power (X_{29})	-0.004	-0.107	0.103	0.047707 X_{35}	0.043136 X_{31}	0.031968 X_9
Change in rainfall pattern over last 20 year (X_{30})	0.035	0.023	0.011	0.037481 X_6	0.034973 X_{22}	0.030727 X_9
Change pattern in temperature(day/night) over last 20 year (X_{31})	0.106	0.282	-0.176	0.036631 X_7	0.022797 X_9	0.019299 X_{20}
Change pattern in weather disaster over last 20 year (X_{32})	-0.109	-0.047	-0.062	0.022193 X_{17}	0.019371 X_{18}	0.018061 X_{31}

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Change in seasonal pattern over last 20 year (X_{33})	-0.055	0.052	-0.107	0.031031 X_{18}	0.020766 X_{15}	0.019708 X_{31}
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	-0.074	-0.147	0.073	0.034529 X_{26}	0.029342 X_{35}	0.019712 X_{6}
Change pattern in weed problem over last 20 year (X_{35})	0.049	0.182	-0.133	0.033175 X_{9}	0.024848 X_{7}	0.017605 X_{42}

Residual effect**: 0.62**

X_9 (Count of substantial indirect effect=18)

Table 6.19, it represents the path analysis to explain the direct, indirect and residual effect of exogenous variables on consequent variables i.e. net return from rice cultivation (Y_1) in the light of climate change.

Results reveals that the variable farm Size (X_9) exerts highest direct and water management % (X_{25}) exerts highest indirect effect on net return from rice cultivation over the other 35 exogenous variables in the light of climate change.

The variable, farm size (X_9) has been found to channelize the substantial indirect effect of, as many as, (18 times) to define its tremendous impact over the other exogenous variables to ultimately characterize the performance of consequent variable, Y_1 (net return from rice) in the light of climate change.

The residual effect is 62, it could be concluded that the combination of 35 variables in this investigation in the form of exogenous variables had been able to explain 38% of the variation in the consequent variable i.e. net return from rice cultivation in the light of climate change.

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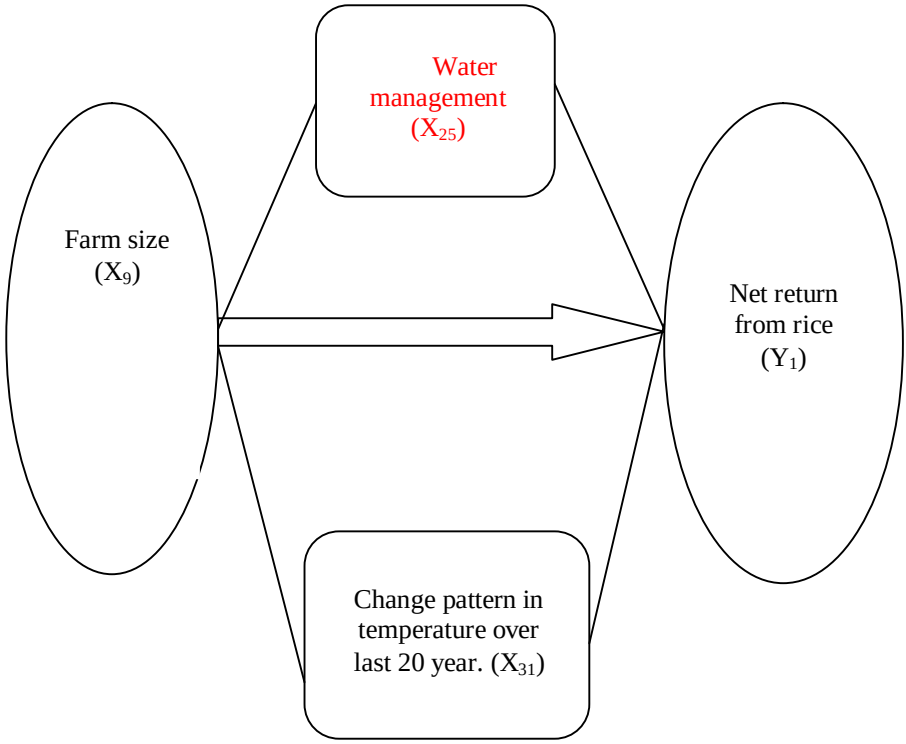

Model 1: Path analysis: Net return from rice (Y_1) and 35 exogenous variables. (Conventional method of rice)

Table 6.20: Path analysis: direct, indirect and residual effect: exogenous variables (X_1-X_{35}) vs. Expenditure on health care (Y_2).

Conventional method of rice

Variables	Total Effect	Total Direct Effect	Total Indirect Effect	Substantial Indirect Effect		
				I	II	III
Age (X_1)	-0.050	-0.113	0.062	0.050438 X_7	0.033387 X_{26}	0.024059 X_{32}
Education (X_2)	-0.094	-0.052	-0.042	0.046729 X_{16}	0.036643 X_{20}	0.03305 X_1

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Family education status (X_3)	0.299	0.200	0.099	0.225309 X_7	0.053403 X_{24}	0.033286 X_{11}
Primary occupation (X_{41})	0.071	-0.226	0.298	0.132692 X_7	0.037007 X_{18}	0.034009 X_{42}
Secondary occupation (X_{42})	0.013	-0.057	0.070	0.13511 X_{41}	0.041792 X_{24}	0.035335 X_{25}
Caste (X_5)	-0.076	-0.025	-0.051	0.021377 X_6	0.018459 X_{28}	0.016897 X_{41}
Family type (X_6)	-0.485	0.147	-0.632	0.104477 X_{81}	0.0334 X_{41}	0.026308 X_{20}
Family size (X_7)	-0.544	-0.747	0.203	0.130303 X_6	0.116843 X_{81}	0.04022 X_{41}
Family income primary (X_{81})	0.045	-0.316	0.361	0.27602 X_7	0.061523 X_9	0.042808 X_3
Family income secondary (X_{82})	0.027	0.012	0.016	0.109096 X_7	0.048747 X_3	0.048279 X_{41}
Farm size (X_9)	-0.047	0.133	-0.179	0.04624 X_{13}	0.036929 X_{11}	0.030858 X_{19}
Social participation (X_{10})	-0.116	0.025	-0.141	0.03768 X_9	0.023261 X_{16}	0.0176 X_{20}
Risk orientation (X_{11})	0.162	0.260	-0.098	0.025601 X_3	0.018842 X_9	0.01321 X_{16}
Index of farm mechanization (X_{12})	-0.100	-0.092	-0.008	0.056531 X_9	0.025837 X_3	0.020734 X_{13}

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Cropping intensity (X_{13})	-0.111	-0.092	-0.019	0.057079 X_{81}	0.047104 X_{41}	0.024885 X_{31}
Selling% (X_{14})	-0.055	0.006	-0.061	0.023949 X_9	0.023904 X_{13}	0.017594 X_{16}
Debt (X_{15})	0.099	0.091	0.008	0.114885 X_7	0.028616 X_{26}	0.015621 X_{25}
Migration (X_{16})	0.103	-0.095	0.198	0.11643 X_{81}	0.078062 X_{25}	0.064469 X_{26}
Mass media exposure (X_{17})	-0.068	0.097	-0.165	0.021059 X_{12}	0.013512 X_9	0.013179 X_1

Variables	**Total Effect**	**Total Direct Effect**	**Total Indirect Effect**	**Substantial Indirect Effect**		
				I	**II**	**III**
Utilization of personal cosmopolite sources of information (X_{18})	-0.153	-0.132	-0.021	0.063571 X_{41}	0.014534 X_1	0.011791 X_{81}
Utilization of personal localite sources of information (X_{19})	0.061	0.132	-0.072	0.030863 X_9	0.02119 X_{31}	0.018943 X_{30}
Contact with extension personal (X_{20})	0.020	0.200	-0.180	0.037691 X_{81}	0.019355 X_6	0.014881 X_{28}
Seed rate% (X_{21})	0.029	0.015	0.014	0.024489 X_3	0.022182 X_{41}	0.020859 X_{24}

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Fertilizer% (X_{22})	0.121	-0.020	0.141	0.162645 X_7	0.031903 X_{18}	0.025323 X_{13}
Pesticide% (X_{23})	0.128	-0.025	0.153	0.176168 X_7	0.028376 X_{28}	0.024173 X_{26}
Weed management%(X_{24})	-0.139	-0.159	0.019	0.032357 X_9	0.025687 X_{11}	0.02419 X_6
Water management% (X_{25})	-0.158	-0.148	-0.010	0.053831 X_{11}	0.050412 X_{16}	0.048338 X_{19}
Irrigation index%(X_{26})	-0.158	-0.149	-0.009	0.074151 X_{11}	0.041222 X_{16}	0.038876 X_{19}
Sowing time (X_{27})	-0.013	-0.103	0.090	0.041378 X_7	0.0309 X_{11}	0.029606 X_{32}
Varietal change (X_{28})	-0.076	-0.112	0.036	0.047977 X_7	0.037916 X_{30}	0.024695 X_{25}
Farm power (X_{29})	0.132	-0.008	0.140	0.093553 X_7	0.028586 X_{18}	0.028137 X_{28}
Change in rainfall pattern over last 20 year (X_{30})	0.060	0.150	-0.091	0.074239 X_7	0.016682 X_{19}	0.015378 X_{26}
Change pattern in temperature (day/night) over last 20 year(X_{31})	-0.135	-0.127	-0.008	0.030609 X_6	0.020634 X_{20}	0.018231 X_{27}
Change pattern in weather disaster over last 20 year (X_{32})	0.045	0.143	-0.099	0.019782 X_{28}	0.018762 X_7	0.017498 X_{11}

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Change in seasonal pattern over last 20 year (X_{33})	-0.015	0.055	-0.070	0.027895 X_{32}	0.018855 X_{24}	0.01053 X_{27}
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	0.023	-0.085	0.108	0.068742 X_7	0.02914 X_1	0.026497 X_3
Change pattern in weed problem over last 20 year (X_{35})	-0.086	0.070	-0.157	0.024879 X_6	0.019621 $X1_6$	0.015713 X_1

Residual effect**: 0.67**

X_7 (Count of substantial indirect effect=14)

Table 6.20, It represents the path analysis to explain the direct, indirect and residual effect of exogenous variables on consequent variables i.e. expenditure on health care (Y_2) in the light of climate change.

Results reveals that the variable risk orientation (X_{11}) exerts highest direct and family income primary (X_{81}) exerts highest indirect effect on expenditure on health care (Y_2) over the other 35 exogenous variables in the light of climate change.

The variable, family size (X_7) has been found to channelize the substantial indirect effect of, as many as, (14 times) to define its tremendous impact over the other exogenous variables to ultimately characterize the performance of consequent variable, expenditure on health care (Y_2) in the light of climate change.

The residual effect is 67, it could be concluded that the combination of 35 variables in this investigation in the form of

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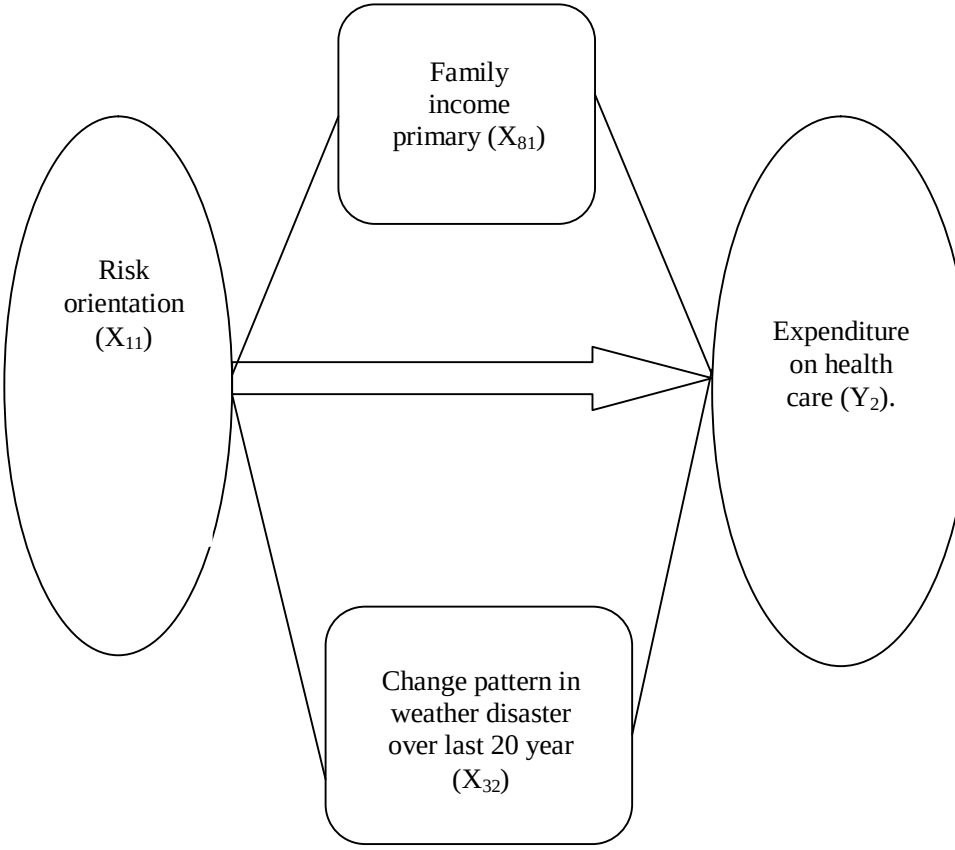
exogenous variables had been able to explain 33% of the variation in the consequent variable i.e. expenditure on health care (Y2) in the light of climate change.



Model 2: Path analysis: Expenditure on health care (Y_2) and 35 exogenous variables. (Conventional method of rice)

Table 6.21: Path analysis: direct, indirect and residual effect: exogenous variables (X_1-X_{35}) vs. Net return from rice (Y_1).

SRI method

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Variables	Total Effect	Total Direct Effect	Total Indirect Effect	Substantial Indirect Effect		
				I	II	III
Age (X_1)	-0.277	-0.079	-0.198	0.013898 X_7	0.009886 $X1_7$	0.008093 X_{82}
Education (X_2)	0.173	0.076	0.097	0.084253 X_9	0.033553 X_{81}	0.022326 X_{16}
Family education status (X_3)	0.086	-0.012	0.098	0.034737 X_9	0.029563 X_{81}	0.027042 X_7
Primary occupation (X_{41})	0.331	-0.033	0.364	0.301802 X_9	0.021971 X_2	0.01883 X_{81}
Secondary occupation (X_{42})	-0.267	0.000	-0.266	0.016233 X_{41}	0.013111 X_2	0.010767 X_{31}
Caste (X_5)	0.126	0.049	0.078	0.075889 X_9	0.017325 X_{15}	0.015955 X_{33}
Family type (X_6)	-0.052	0.003	-0.055	0.065032 X_9	0.01691 X_1	0.012435 X_{28}
Family size (X_7)	-0.032	-0.066	0.034	0.073011 X_9	0.016614 X_1	0.013109 X_{28}
Family income primary (X_{81})	0.417	0.146	0.271	0.248899 X_9	0.024498 X_7	0.017467 X_2
Family income secondary (X_{82})	0.074	-0.077	0.151	0.063176 X_{81}	0.024709 X_9	0.021541 X_2

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Farm size (X_9)	0.890	0.794	0.096	0.045717 X_{81}	0.020543 X_1	0.017386 X_{16}
Social participation (X_{10})	0.034	-0.010	0.043	0.033659 X_9	0.027219 X_2	0.020563 X_{81}
Risk orientation (X_{11})	0.148	0.053	0.095	0.071036 X_9	0.013976 X_{15}	0.011645 X_{34}
Index of farm mechanization (X_{12})	-0.020	-0.037	0.017	0.023721 X_{11}	0.019755 X_{31}	0.013475 X_{34}
Cropping intensity (X_{13})	-0.277	-0.058	-0.218	0.019345 X_{28}	0.014604 X_{82}	0.009872 X_{25}
Selling% (X_{14})	-0.122	-0.053	-0.068	0.018768 X_{81}	0.010222 X_{31}	0.008645 X_{28}
Debt (X_{15})	-0.176	-0.083	-0.093	0.01632 X_{82}	0.009303 X_{23}	0.009301 X_{35}
Migration (X_{16})	-0.365	-0.071	-0.293	0.013274 X_{17}	0.010461 X_{19}	0.007291 X_{23}
Mass media exposure (X_{17})	0.188	-0.070	0.258	0.157307 X_9	0.046006 X_2	0.031006 X_{81}

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Variables	Total Effect	Total Direct Effect	Total Indirect Effect	Substantial Indirect Effect		
				I	II	III
Utilization of personal cosmopolite sources of information (X_{18})	0.003	-0.033	0.036	0.016422 X_9	0.015092 X_{33}	0.013099 X_{82}
Utilization of personal localite sources of information (X_{19})	-0.183	-0.089	-0.093	0.012472 X_{26}	0.011099 X_5	0.008334 X_{16}
Contact with extension personal (X_{20})	0.101	0.008	0.093	0.083665 X_9	0.018205 X_{14}	0.018155 X_1
Seed rate% (X_{21})	0.055	0.025	0.030	0.021658 X_{15}	0.014893 X_9	0.012699 X_1
Fertilizer% (X_{22})	-0.030	0.058	-0.088	0.008726 X_{24}	0.007971 X_{28}	0.006667 X_{29}
Pesticide% (X_{23})	-0.097	-0.077	-0.020	0.012696 X_{28}	0.010044 X_{15}	0.006715 X_{16}
Weed management% (X_{24})	0.105	0.067	0.038	0.013777 X_{16}	0.011666 X_2	0.009834 X_{26}
Water management% (X_{25})	-0.102	0.059	-0.161	0.018149 X_{23}	0.016786 X_{34}	0.008972 X_{82}
Irrigation index% (X_{26})	0.017	0.074	-0.057	0.035592 X_{16}	0.030976 X_{81}	0.017052 X_2

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Sowing time (X_{27})	0.087	0.031	0.056	0.082595 X_9	0.017187 X_{81}	0.010126 X_{13}
Varietal change (X_{28})	-0.160	0.065	-0.225	0.007107 X_{22}	0.006569 X_{11}	0.004503 X_{82}
Farm power (X_{29})	-0.115	-0.030	-0.085	0.014944 X_{31}	0.014592 X_{26}	0.011066 X_1
Change in rainfall pattern over last 20 year (X_{30})	-0.182	-0.019	-0.164	0.022238 X_{28}	0.016657 X_{19}	0.015059 X_{34}
Change pattern in temperature(day/night) over last 20 year (X_{31})	0.069	0.113	-0.044	0.00792 X_7	0.005201 X_{24}	0.005188 X_{41}
Change pattern in weather disaster over last 20 year (X_{32})	0.124	-0.007	0.131	0.109331 X_9	0.016846 X_{34}	0.01222 X_{15}
Change in seasonal pattern over last 20 year (X_{33})	-0.156	-0.061	-0.095	0.014101 X_{81}	0.011894 X_{31}	0.008179 X_{18}
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	-0.037	-0.075	0.038	0.02375 X_9	0.009911 X_5	0.008796 X_{82}
Change pattern in weed problem over last 20 year (X_{35})	-0.053	0.039	-0.091	0.0077 X_{22}	0.006664 X_1	0.005849 X_7

Residual effect**: 0.32**

X_9 (Count of substantial indirect effect=17)

Table 6.21, It represents the path analysis to explain the direct, indirect and residual effect of exogenous variables on

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consequent variables i.e. net return from rice cultivation (Y_1) in the light of climate change.

Results reveals that the variable farm size(X_9) exerts highest direct and primary occupation (X_{41}) exerts highest indirect effect on net return from rice cultivation over the other 35 exogenous variables in the light of climate change.

The variable, farm size (X_9) has been found to channelize the substantial indirect effect of, as many as, (17 times) to define its tremendous impact over the other exogenous variables to ultimately characterize the performance of consequent variable, Y_1 (net return from rice) in the light of climate change.

The residual effect is 32, it could be concluded that the combination of 35 variables in this investigation in the form of exogenous variables had been able to explain 68% of the variation in the consequent variable i.e. net return from rice cultivation in the light of climate change.

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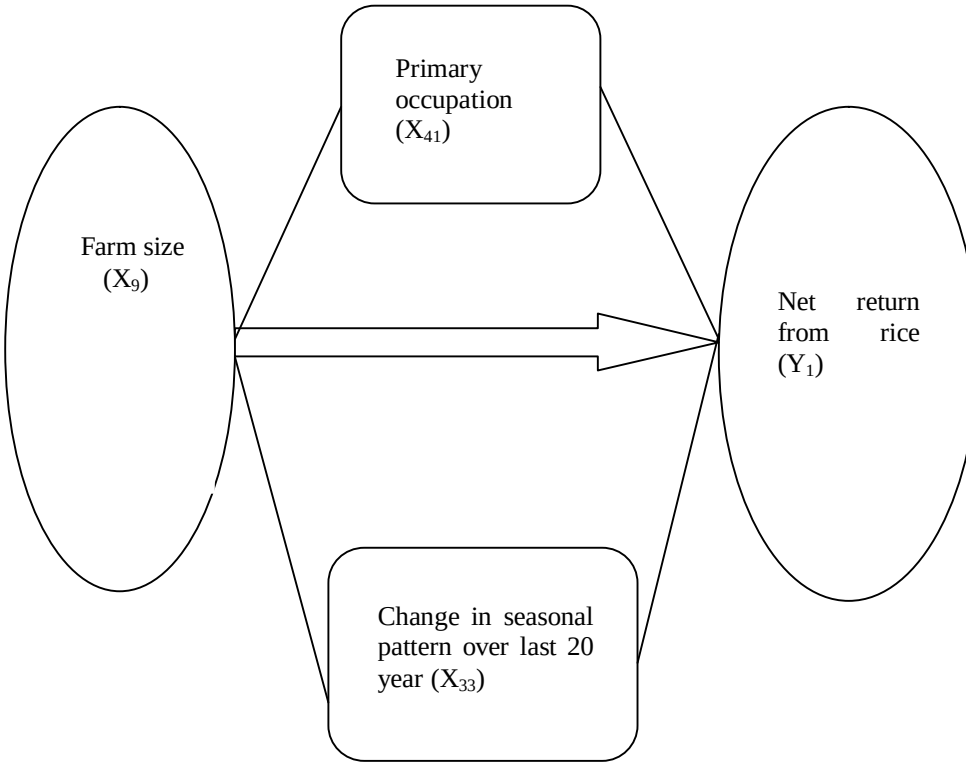

Model 3: Path analysis: Net return from rice (Y_1) and 35 exogenous variables.

(SRI method)

Table 6.22: Path analysis: direct, indirect and residual effect: exogenous variables (X_1-X_{35}) vs. Expenditure on health care (Y_2).

SRI method

Variables	Total Effect	Total Direct Effect	Total Indirect Effect	Substantial Indirect Effect		
				I	II	III
Age (X_1)	0.258	0.142	0.115	0.052972 X_6	0.050625 X_9	0.027186 X_{21}

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Education (X_2)	0.034	-0.047	0.082	0.094691 X_{17}	0.040226 X_3	0.035318 X_{13}
Family education status (X_3)	0.299	0.217	0.082	0.096405 X_6	0.033947 X_{13}	0.026683 X_{81}
Primary occupation (X_{41})	-0.165	-0.091	-0.074	0.03968 X_{17}	0.037478 X_{13}	0.029193 X_3
Secondary occupation (X_{42})	0.263	0.146	0.117	0.068984 X_9	0.045378 X_{41}	0.030687 X_6
Caste (X_5)	-0.140	-0.085	-0.054	0.033041 X_{15}	0.018518 X_{10}	0.018496 X_{13}
Family type (X_6)	-0.484	-0.247	-0.237	0.024336 X_{30}	0.024235 X_{28}	0.023997 X_{17}
Family size (X_7)	-0.492	-0.047	-0.444	0.025548 X_{28}	0.023006 X_{30}	0.015611 X_{17}
Family income primary (X_{81})	0.250	0.132	0.119	0.078912 X_6	0.050865 X_{13}	0.044001 X_3
Family income secondary (X_{82})	0.125	-0.052	0.177	0.057022 X_{81}	0.051271 X_{42}	0.038076 X_{13}
Farm size (X_9)	-0.125	-0.195	0.070	0.061928 X_{30}	0.056227 X_{13}	0.041264 X_{81}
Social participation (X_{10})	0.022	-0.103	0.126	0.055394 X_3	0.030565 X_{21}	0.028643 X_{42}
Risk orientation (X_{11})	-0.010	0.140	-0.150	0.026654 X_{15}	0.016136 X_{12}	0.01574 X_{28}

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Index of farm mechanization (X_{12})	0.003	0.036	-0.033	0.06277 X_{11}	0.013027 X_{31}	0.012851 X_{15}
Cropping intensity (X_{13})	-0.218	-0.201	-0.017	0.054504 X_9	0.037703 X_{28}	0.025561 X_{11}
Selling% (X_{14})	0.061	-0.101	0.162	0.027506 X_{25}	0.02327 X_9	0.019074 X_{13}
Debt (X_{15})	-0.044	-0.159	0.115	0.043951 X_{21}	0.027871 X_{30}	0.02168 X_{25}
Migration (X_{16})	0.055	0.003	0.052	0.047609 X_9	0.03426 X_{26}	0.017398 X_{10}
Mass media exposure (X_{17})	0.087	0.156	-0.069	0.027986 X_{81}	0.023317 X_{30}	0.021654 X_{13}

Variables	Total Effect	Total Direct Effect	Total Indirect Effect	Substantial Indirect Effect		
				I	II	III
Utilization of personal cosmopolite sources of information (X_{18})	-0.067	-0.037	-0.030	0.022938 X_{15}	0.014115 X_{28}	0.009765 X_{11}
Utilization of personal localite sources of information (X_{19})	-0.140	-0.069	-0.071	0.046778 X_{30}	0.027449 X_9	0.017605 X_{42}

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Contact with extension personal (X_{20})	-0.105	-0.032	-0.073	0.034466 X_{14}	0.017348 X_3	0.015395 X_{81}
Seed rate% (X_{21})	-0.155	-0.169	0.015	0.041304 X_{15}	0.021558 X_{11}	0.020971 X_{30}
Fertilizer% (X_{22})	-0.074	-0.005	-0.068	0.015535 X_{28}	0.012617 X_1	0.011046 X_{26}
Pesticide% (X_{23})	-0.052	-0.082	0.030	0.049559 X_{25}	0.024744 X_{28}	0.019155 X_{15}
Weed management % (X_{24})	-0.071	-0.083	0.012	0.028306 X_3	0.015941 X_{11}	0.01363 X_{25}
Water management % (X_{25})	-0.227	-0.211	-0.016	0.034867 X_9	0.019317 X_{23}	0.016348 X_{15}
Irrigation index% (X_{26})	0.037	-0.068	0.105	0.029155 X_3	0.027959 X_{81}	0.026357 X_6
Sowing time (X_{27})	0.060	-0.016	0.077	0.052161 X_{30}	0.043041 X_{25}	0.034797 X_{13}
Varietal change (X_{28})	-0.070	0.127	-0.198	0.026232 X_9	0.018862 X_{17}	0.017382 X_{11}
Farm power (X_{29})	-0.041	0.074	-0.115	0.025272 X_9	0.013914 X_{21}	0.012674 X_{35}
Change in rainfall pattern over last 20 year (X_{30})	-0.061	-0.251	0.189	0.048112 X_9	0.043342 X_{28}	0.029938 X_{11}

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Change pattern in temperature (day/night) over last 20 year (X_{31})	0.218	0.074	0.143	0.04952 X_{25}	0.021049 X_6	0.021015 X_{30}
Change pattern in weather disaster over last 20 year (X_{32})	-0.122	-0.068	-0.054	0.030741 X_{13}	0.029001 X_{30}	0.023304 X_{15}
Change in seasonal pattern over last 20 year (X_{33})	0.125	0.046	0.078	0.025145 X_9	0.024363 X_{17}	0.022282 X_5
Change pattern in insect/ pests & diseases over last 20 year (X_{34})	0.106	-0.018	0.124	0.050395 X_{30}	0.047251 X_{25}	0.022593 X_3
Change pattern in weed problem over last 20 year (X_{35})	0.094	0.065	0.029	0.035128 X_{25}	0.020282 X_{30}	0.017245 X_{10}

Residual effect**: 0.67**

X_{30} (Count of substantial indirect effect=12)

Table 6.22, it represents the path analysis to explain the direct, indirect and residual effect of exogenous variables on consequent variables i.e. expenditure on health care (Y_2) in the light of climate change.

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Result reveals that the variable family education status (X_3) exerts highest direct and change in rainfall pattern over last 20 year (X_{30}) exerts highest indirect effect on expenditure on health care (Y_2) over the other 35 exogenous variables in the light of climate change.

The variable, change in rainfall pattern over last 20 year (X_{30}) has been found to channelize the substantial indirect effect of, as many as, (12 times) to define its tremendous impact over the other exogenous variables to ultimately characterize the performance of consequent variable, expenditure on health care (Y_2) in the light of climate change.

The residual effect is 67, it could be concluded that the combination of 35 variables in this investigation in the form of exogenous variables had been able to explain 33% of the variation in the consequent variable i.e. expenditure on health care (Y_2) in the light of climate change.

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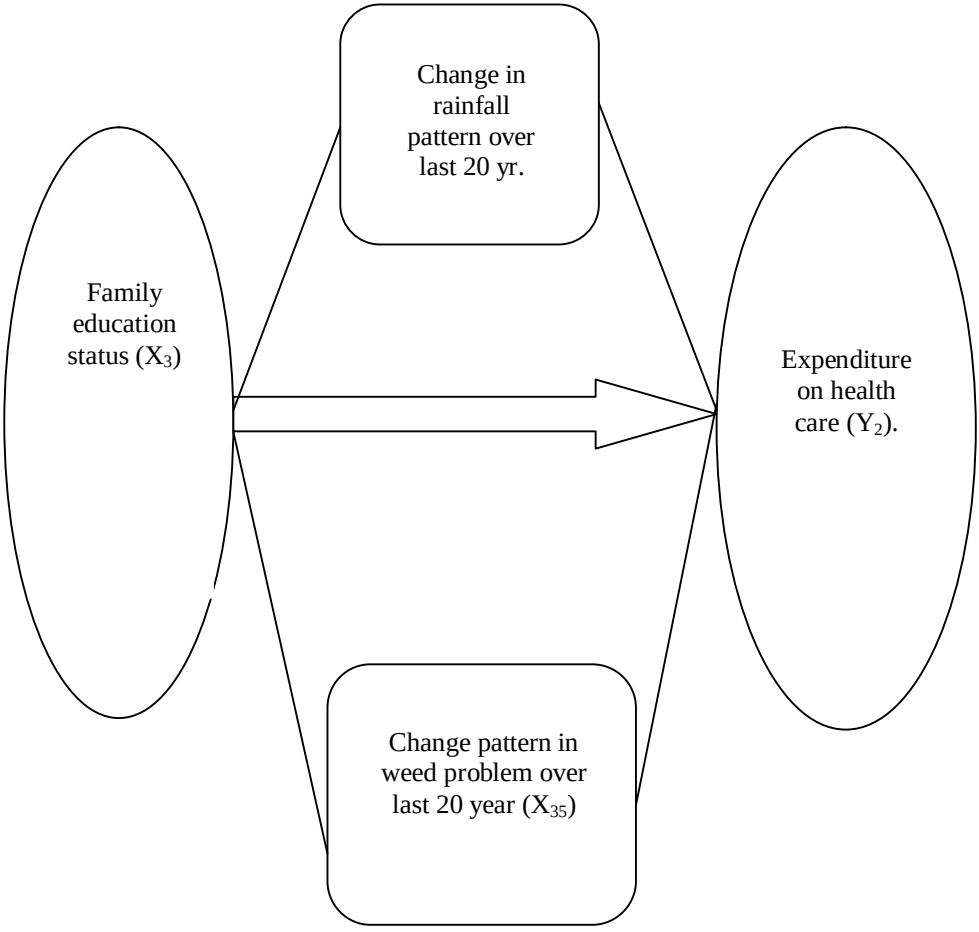

Model 4: Path analysis: Expenditure on health care (Y_2) and 35 exogenous variables. (SRI method)

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Table 6.23: Factor analysis: Indicator of impact on sustainable livelihood generation through rice production management in the light of climate change. (Conventional method of rice)

Factor	Variables	Factor loading	% of variance	Cumulative %	Factor renaming
Factor 1	X_2 X_9 X_{11} X_{14} X_{25} X_{26}	0.591 0.672 0.198 0.332 0.673 0.546	9.996	9.996	**Farm capability**
Factor 2	X_3 X_{41} X_{81} X_{22} X_{23}	0.32 0.402 0.474 0.41 0.234	8.266	18.262	**Input support**
Factor 3	X_1 X_6 X_7 X_{16} X_{24}	0.489 0.279 0.297 0.381 0.433	7.114	25.376	**Family composition**
Factor 4	X_{42} X_{82} X_{10}	0.374 0.448 0.471	5.903	31.278	**Social status**
Factor 5	X_{29} X_{35}	0.513 0.545	5.32	36.598	**Weed management**
Factor 6	X_{12} X_{18} X_{28}	0.506 0.347 0.4	4.787	41.385	**Resource support**
Factor 7	X_{19} X_{32} X_{33}	0.42 0.387 0.401	4.095	45.48	**Weather disaster & seasonal pattern**
Factor 8	X_{20} X_{21}	0.413 0.443	4.075	49.555	**Extension contact**

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Factor 9	X_{30}	0.42	3.541	56.834	**Rainfall pattern**
Factor 10	X_{27} X_{34}	0.337 0.569	3.446	60.28	**Change pattern in insect/pests/diseases**
Factor 11	X_{17}	0.338	3.126	63.406	**Exposure**
Factor 12	X_5 X_{13}	0.353 0.238	2.994	66.4	**Cropping intensity**
Factor 13	X_{15} X_{31}	0.339 0.381	2.874	69.274	**Change in temperature**

Conventional method of rice: Factor analysis for clubbing of variables into factor based on factor loading.

Factor 1

The factor 1 is renaming as **Farm capability**. It accounted for 9.996 percent of the total data variance with 9.996 cumulative percent. Six variables having high factor loading were chosen to interpret this factor. The factor loadings were all positive. The variables and factor loading were:

Variability		Factor loading
X_{25}	Water management	0.673
X_9	Farm size	0.672
X_2	Education	0.591
X_{26}	Irrigation index%	0.546
X_{14}	Selling%	0.332
X_{11}	Risk orientation	0.198

Factor 2

The factor 2 is renaming as **Input support**. It accounted for 8.266 percent of the total data variance with 18.262 cumulative

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percent. Five variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{81}	Family income primary	0.474
X_{22}	Fertilizer%	0.410
X_{41}	Primary occupation	0.402
X_3	Family education status	0.320
X_{23}	Pesticide%	0.234

Factor 3

The factor 3 is renaming as **Family composition**. It accounted for 7.114 percent of the total data variance with 25.376 cumulative percent. Five variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_1	Age	0.489
X_{24}	Weed management%	0.433
X_{16}	Migration	0.381
X_7	Family size	0.297
X_6	Family type	0.279

Factor 4

The factor 4 is renaming as **Social status**. It accounted for 5.903 percent of the total data variance with 31.278 cumulative percent. Three variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

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Variability		Factor loading
X_{10}	Social participation	0.471
X_{82}	Family income secondary	0.448
X_{42}	Secondary occupation	0.374

Factor 5

The factor 5 is renaming as **Weed management**. It accounted for 5.32 percent of the total data variance with 36.598 cumulative percent. Two variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{35}	Change pattern in weed problem over last 20 years.	0.545
X_{29}	Farm power	0.513

Factor 6

The factor 6 is renaming as **Resource support**. It accounted for 4.787 percent of the total data variance with 41.385 cumulative percent. Three variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{12}	Index of farm mechanization	0.506
X_{28}	Varietal change	0.400
X_{18}	Utilization of personal cosmopolite sources of information	0.347

Factor 7

The factor 7 is renaming as **Weather disaster & seasonal pattern**. It accounted for 4.095 percent of the total data variance with 45.48 cumulative percent. Three variables having high factor

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loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{19}	Utilization of personal localite sources of information	0.420
X_{33}	Change in seasonal pattern over last 20 year	0.401
X_{32}	Change pattern in weather disaster over last 20 year	0.387

Factor 8

The factor 8 is renaming as **Extension contact**. It accounted for 4.075 percent of the total data variance with 49.555 cumulative percent. Two variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{21}	Seed rate%	0.443
X_{20}	Contact with extension personal	0.413

Factor 9

The factor 9 is renaming as **Rainfall pattern**. It accounted for 3.541 percent of the total data variance with 56.834 cumulative percent. A variables having high factor loading was chosen to interpret this factor. The factor loading was positive. The variable and factor loading was:

Variability		Factor loading
X_{30}	Change in rainfall pattern over last 20 year	0.42

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Factor 10

The factor 10 is renaming as **Change pattern in insect/pests and diseases**. It accounted for 3.446 percent of the total data variance with 60.28 cumulative percent. Two variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{34}	Change pattern in insect/pests and diseases over last 20 year	0.569
X_{27}	Sowing time	0.337

Factor 11

The factor 11 is renaming as **Exposure**. It accounted for 3.126 percent of the total data variance with 63.406 cumulative percent. A variables having high factor loading was chosen to interpret this factor. The factor loading was positive. The variable and factor loading was:

Variability		Factor loading
X_{30}	Mass media exposure	0.338

Factor 12

The factor 12 is renaming as **Cropping intensity**. It accounted for 2.994 percent of the total data variance with 66.4 cumulative percent. Two variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_5	Caste	0.353
X_{13}	Cropping intensity	0.238

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Factor 13

The factor 13 is renaming as **Change in temperature**. It accounted for 2.874 percent of the total data variance with 69.274 cumulative percent. Two variables having high factor loading was chosen to interpret this factor. The factor loading were positive. The variable and factor loading were:

Variability		Factor loading
X_{31}	Change pattern in temperature over last last 20 year	0.381
X_{15}	Debt	0.339

Table 6.24: Factor analysis: Indicator of impact on sustainable livelihood generation through rice production management in the light of climate change. (SRI method of rice)

Factor	Variables	Factor loading	% of variance	Cumulative %	Factor renaming
Factor 1	X_2 X_3 X_{41} X_{81} X_9 X_{17} X_{27}	0.519 0.351 0.462 0.665 0.67 0.435 0.284	9.54	9.54	**Family capability**
Factor 2	X_6 X_7 X_{32}	0.741 0.759 0.305	8.35	17.89	**Weather disaster**
Factor 3	X_{42} X_{82} X_{10} X_{12} X_{13}	0.413 0.41 0.305 0.363 0.238	6.332	24.222	**Occupation mobility**

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Factor 4	X_{15} X_{19} X_{29}	0.496 0.322 0.351	5.856	30.078	**Debt**
Factor 5	X_{20}	0.435	5.046	35.124	**Extension contact**
Factor 6	X_{11} X_{14} X_{28}	0.376 0.327 0.438	4.515	39.638	**Varietal change**
Factor 7	X_{5} X_{18} X_{26}	0.339 0.396 0.497	4.383	44.021	**Irrigation facility**
Factor 8	X_{31}	0.555	4.134	48.156	**Change in temperature**
Factor 9	X_{22} X_{23} X_{34}	0.407 0.3 0.446	3.993	52.148	**Input support**
Factor 10	X_{30}	0.371	3.643	55.792	**Rainfall pattern**
Factor 11	X_{21}	0.347	3.283	59.075	**Seed rate**
Factor 12	X_{25}	0.236	3.098	62.173	**Water management**
Factor 13	X_{35}	0.482	3.037	65.21	**Weed management**
Factor 14	X_{16} X_{24}	0.104 0.355	2.868	68.078	**Migration**
Factor 15	X_{1} X_{33}	0.21 0.436	2.614	70.692	**Change in seasonal pattern**

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SRI method of rice: Factor analysis for clubbing of variables into factor based on factor loading.

Factor 1

The factor 1 is renaming as **Family capability**. It accounted for 9.54 percent of the total data variance with 9.54 cumulative percent. Seven variables having high factor loading were chosen to interpret this factor. The factor loadings were all positive. The variables and factor loading were:

Variability		Factor loading
X_9	Farm size	0.670
X_{81}	Family income primary	0.665
X_2	Education	0.519
X_{41}	Primary occupation	0.462
X_{17}	Mass media exposure	0.435
X_3	Family education status	0.351
X_{27}	Sowing time	0.284

Factor 2

The factor 2 is renaming as **Weather disaster**. It accounted for 8.35 percent of the total data variance with 17.89 cumulative percent. Three variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_7	Family size	0.759
X_6	Family type	0.741
X_{32}	Change pattern in weather disaster over last 20 year	0.305

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Factor 3

The factor 3 is renaming as **Occupation mobility**. It accounted for 6.332 percent of the total data variance with 24.222 cumulative percent. Five variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{42}	Secondary occupation	0.413
X_{82}	Family income secondary	0.410
X_{12}	Index of farm mechanization	0.363
X_{10}	Social participation	0.305
X_{13}	Cropping intensity	0.238

Factor 4

The factor 4 is renaming as **Debt**. It accounted for 5.856 percent of the total data variance with 30.078 cumulative percent. Three variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{15}	Debt	0.496
X_{29}	Farm power	0.351
X_{19}	Utilization of personal localite sources of information	0.322

Factor 5

The factor 5 is renaming as **Extension contact**. It accounted for 5.046 percent of the total data variance with 35.124 cumulative percent. A variables having high factor loading was

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chosen to interpret this factor. The factor loading was positive. The variable and factor loading was:

Variability		Factor loading
X_{20}	Contact with extension personal	0.435

Factor 6

The factor 6 is renaming as **Varietal change**. It accounted for 4.515 percent of the total data variance with 39.638 cumulative percent. Three variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{28}	Varietal change	0.438
X_{11}	Risk orientation	0.376
X_{14}	Selling%	0.327

Factor 7

The factor 7 is renaming as **Irrigation facility**. It accounted for 4.383 percent of the total data variance with 44.021 cumulative percent. Three variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{26}	Irrigation index%	0.497
X_{18}	Utilization of personal cosmopolite sources of information	0.396
X_5	Caste	0.339

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Factor 8

The factor 8 is renaming as **Change in temperature**. It accounted for 4.134 percent of the total data variance with 48.156 cumulative percent. A variables having high factor loading was chosen to interpret this factor. The factor loading was positive. The variable and factor loading was:

Variability		Factor loading
X_{31}	Change pattern in temperature (day/night) over last 20 year	0.555

Factor 9

The factor 9 is renaming as **Input support**. It accounted for 3.993 percent of the total data variance with 52.148 cumulative percent. Three variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{34}	Change pattern in insect/ pests and diseases over last 20 year	0.446
X_{22}	Fertilizer%	0.407
X_{23}	Pesticide%	0.300

Factor 10

The factor 10 is renaming as **Rainfall pattern**. It accounted for 3.643 percent of the total data variance with 55.792 cumulative percent. A variables having high factor loading was chosen to interpret this factor. The factor loading was positive. The variable and factor loading was:

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Variability		Factor loading
X_{30}	Change in rainfall pattern over last 20 year	0.371

Factor 11

The factor 11 is renaming as **Seed rate**. It accounted for 3.283 percent of the total data variance with 59.075 cumulative percent. A variables having high factor loading was chosen to interpret this factor. The factor loading was positive. The variable and factor loading was:

Variability		Factor loading
X_{21}	Seed rate%	0.347

Factor 12

The factor 12 is renaming as **Water management**. It accounted for 3.098 percent of the total data variance with 62.173 cumulative percent. A variables having high factor loading was chosen to interpret this factor. The factor loading was positive. The variable and factor loading was:

Variability		Factor loading
X_{25}	Water management%	0.236

Factor 13

The factor 13 is renaming as **Weed management**. It accounted for 3.037 percent of the total data variance with 65.21 cumulative percent. A variables having high factor loading was chosen to interpret this factor. The factor loading was positive. The variable and factor loading was:

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Variability		Factor loading
X_{35}	Change pattern in weed problem over last 20 year	0.482

Factor 14

The factor 14 is renaming as **Migration**. It accounted for 2.868 percent of the total data variance with 68.078 cumulative percent. Two variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{24}	Weed management%	0.355
X_{16}	Migration	0.104

Factor 15

The factor 15 is renaming as **Change in seasonal pattern**. It accounted for 2.614 percent of the total data variance with 70.692 cumulative percent. Two variables having high factor loading were chosen to interpret this factor. The factor loading was positive. The variable and their factor loading were:

Variability		Factor loading
X_{33}	Change in seasonal pattern over last 20 year	0.436
X_1	Age	0.210

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Table 6.25: Problems faced by the selected respondent regarding rice production management in the light of climate change.

(Conventional method of rice)

S.N.	Problem faced due to climate change	Frequency	%	Rank
1	Yield fluctuation every year due to climate change.	14	14	**I**
2	Rate of increase in insect/pests and disease every year due to unfavorable weather condition.	11	11	**II**
3	Lack of agricultural knowledge and training facilities for better production under climate change situation	9	9	**III**
4	Improper water management/Irrigation sources	9	9	**III**
5	Not getting optimum time for sowing due to change in rainfall pattern.	8	8	**IV**
6	Problem faced during transplanting (availability of sufficient water) due to unfavorable weather condition.	7	7	**V**
7	Labour crisis	7	7	**V**
8	Less adaptation of plant protection measures.	6	6	**VI**
9	Improper weed management.	5	5	**VII**
10	Imbalance use of chemical fertilizers.	5	5	**VII**
11	Unavailability of inputs on proper time.	5	5	**VII**
12	Unfavorable price for output.	5	5	**VII**
13	Lower seed replacement rate and more dependency on farm produce seed.	4	4	**VIII**
14	Irregular electricity.	3	3	**IX**
15	Insect/pests and disease identification	2	2	**X**

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Table 6.26: Problems faced by the selected respondent during rice production management in the light of climate change.

(SRI method of rice)

S.N.	Problem faced due to climate change	Frequency	%	Rank
1	Rate of increase in insect/pests and disease every year due to unfavorable weather condition.	17	17	**I**
2	Improper weed management.	10	10	**II**
3	Yield fluctuation every year due to climate change.	8	8	**III**
4	Insect/pests and disease identification	8	8	**III**
5	Imbalance use of organic/chemical fertilizers.	8	8	**III**
6	Not getting optimum time for sowing due to change in rainfall pattern.	7	7	**IV**
7	Improper water management	6	6	**V**
8	Problem faced during transplanting (availability of sufficient water) due to unfavorable weather condition.	6	6	**V**
9	Unfavorable price for output.	6	6	**V**
10	Less adaptation of plant protection measures.	5	5	**VI**
11	Lack of agricultural knowledge and training facilities for better production under climate change situation	5	5	**VI**
12	Labour crisis	4	4	**VII**
13	Lower seed replacement rate and more dependency on farm produce seed.	4	4	**VII**
14	Unavailability of inputs on proper time.	3	3	**VIII**
15	Irregular electricity.	3	3	**VIII**

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Table 6.27: Suggested intervention according to problem faced due to climate change for both categories of farmers.

S.N		
Conventional method	**SRI method**	
1	3	i) Crop diversification, ii) Essential monitory support (Farmer/State or Central Govt.)
2	1	Integrated pest management should be adopted to avoid yield crisis. (University/ Govt.)
3	11	Distribution of agricultural knowledge and timely training facilities should be provided under the supervision of various governmental agencies. (Govt./University Extn. Dept.)
4	7	Timely water management should be done which also avoid the yield crisis. (University/ State Govt.) Subsidy in Agricultural irrigation work should be increased. (State Dept. of Agril.)
5	6	Watershed management/ water harvesting. (Farmer)
6	8	Water harvesting should be done for further use of that water during transplanting. (Farmer)
7	12	In case of labour crisis, the attitude or behaviour of the owner towards the labour should be co-operative.(Farmer)
8	10	Integrated pest management should be adopted to avoid yield crisis. (University/ Govt.)

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9	2	Timely weed management should be done which also avoid the yield crisis. (University/ State Govt.)
10	5	There should be necessity of soil testing before application of fertilizer to overcome the problems of soil infertility and high production cost. (Both University/Govt.)
11	14	Essential agricultural inputs should be supplied to the farmer through proper distribution system within timeframe. (State Dept. of Agriculture)
12	9	The output price security should be provided by respective APMCs by considering the cost of production of that particular area. (APMC)
13	13	Creation of proper innovation should be necessary regarding quality seed replacement rate and their benefits for upliftment of productivity. (Research institution/ Organization)
14	15	Timely availability of electricity should be required to fulfil the Agricultural operations. (Govt./Electricity board)
15	4	Training/ Farm visit/ Demonstration. (Govt/ KVK/ Agril university)

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