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Adaptation strategies followed by the farmers to mitigate crisis related to drought situation

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Abstract

The study is conducted in the five talukas of Ahmedabad and Botad districts of *Bhal* region of Gujarat which is drought prone area. The results of the study show that majority of the farmers of *Bhal* region had adopted the practices related to seasonal crops, soil and water conservation, irrigation, livestock management, land and labour use, financial management and family to mitigate crisis related to drought and extent of their adaptation found to be medium in all the practices expect land use having adaptation level found to be low.

Keywords: Bhal region, Ahmedabad district, Botad district

Introduction

Drought is a unique natural hazard. Its multi-faceted characteristics cause damage to ecology, economy, and society; hence, drought management deserves dedicated policy with complex dynamics (EGAI, 2007, p13) ^[1]. Major parts of Gujarat suffer from recurrent droughts, and farmers have several preventive and cultural methods in their arsenal that they can put together to build up a good crisis management and adaptation strategy to mitigate drought situations (Gaikwad *et al.*, 2019) ^[2]. Therefore, it is important to identify farmers' current adaptation and coping measures, particularly on farmers' vulnerability to drought (Harikrishna, 2021) ^[3]. Effective economic crisis management for mitigating drought situations and adaptation patterns requires an integrated approach coupled with management skills. The extent of farmers' vulnerability and how this affects the choice of coping or adaptation strategies during drought are prerequisites on the part of the farmers, and it requires efficient management, which implies that farmers must be educated to acquire a higher level of management skills for mitigating drought situations (Mandhe *et al.*, 2019) ^[4]. The above facts would substantiate the need to promote crisis management efficiency related to drought and their adaptation strategy. Keeping in view, a present study entitled "Crisis Management Efficiency Dynamics of the Farmers to Mitigate Drought Situation in *Bhal* Region of Gujarat State" was undertaken with the following objectives.

Objectives of the Study

To study the adaptation strategies followed by the farmers to mitigate crisis related to drought situation

Materials and Methods

The study was carried out in Ahmedabad and Botad district of *Bhal* region of Gujarat with 200 randomly selected farmers of 20 villages of five talukas. A pre-tested Gujarati version interview schedule was prepared in light of the objectives and respondents were interviewed either at their home or work place. Ex-post facto research design was used. For measurement of variables included in study, different scales and scoring techniques were used. The collected data were analyzed by using percentage, mean, standard deviation, correlation coefficient, multiple and step wise regression, analysis of Variance and path analysis. Many adaptation strategies were followed by the farmers in drought situation in relation to their occupation, social and economic activities.

Change in adaptation strategies related to seasonal crops, soil and water conservation, irrigation, livestock management, land and labour use, financial and family management are considered important. Bhal region have witness frequent occurrence of drought and farmers of this region have adopted several measures to take over such situation to sustain their livelihood. Overall practice wise adaptation pattern to mitigate crisis related to drought and item wise adaptation pattern for each practise was studied. The data in this regard are presented in Table 1.

Results

Adaptation strategies related to seasonal crops

Bhal region is known for its agro ecological system having different cropping intensity and irrigation facilities. To achieve sustainable yield by taking advantage of conserve soil moisture and also as far as possible to reduce the losses incurred in the cultivation of seasonal crop during erratic rainfall period, the farmers had resorted several adaptive

strategies. The farmers of Bhal region were asked about adaptation strategies followed by them in drought situation related to seasonal crop which include twelve practices. The practice wise adaptation strategies related to seasonal crops cultivation are represented in the Table 1.

It could be seen from the Table 31 the majority farmers of Bhal region changed crops (94.00 percent) followed by shifted to drought tolerant varieties (79.50 percent) changed to short duration varieties (73.00 percent), shifted to HYV (72.00 percent), increase area under pulse or oilseed crops (71.00 percent), intensified the rabi crop cultivation when kharif crop failed (68.50 percent), reduced quantity of fertilizer applied to dry land (66.00 percent), adopted mixed cropping (64.00 percent), weeds removed regularly to avoid weed competition with crop (61.00 percent), adopted double cropping (60.50 percent), fertilizers applied to yield of rainfed crops (60.00 percent) and early sowing of rabi crop when kharif crop failed (58.00 percent).

Table 1: Practice wise adaptation related to seasonal crops (n=200)

Sr.	Strategies	Frequency	Percentage	Rank
1	Changed crops	188	94.00	I
2	Shifted to drought tolerant varieties	159	79.50	II
3	Changed to short duration varieties	146	73.00	III
4	Shifted to HYV	144	72.00	IV
5	Fertilizers applied to increase the yield of rainfed crops	120	60.00	XI
6	Reduced quantity of fertilizer applied to dry land	132	66.00	VII
7	Increase area under pulse or oilseed crops	142	71.00	V
8	Weeds removed regularly to avoid weed competition with crop.	122	61.00	IX
9	Adopted mixed cropping	128	64.00	VIII
10	Adopted double cropping	121	60.50	X
11	Intensified the rabi crop cultivation when kharif crop failed.	137	68.50	VI
12	Early sowing of rabi crop when kharif crop failed	116	58.00	XII

To epitomize the result, it can be said that changed in the crops and adoption of drought tolerant and short duration varieties were the major practices related to seasonal crop were adaptation strategies followed by farmers of Bhal region.

As far as level of overall adaptation related to seasonal crop is concerned farmers of Bhal region were divided into five categories and data in this regard are presented in Table 2.

Table 2: Level of adaptation related to seasonal crops (n=200)

Sr. No.	Category	Frequency	Percent
1	Very low (0.00 to 20.00 percent)	002	01.00
2	Low (20.01 to 40.00 percent)	003	01.50
3	Medium (40.01 to 60.00 percent)	050	25.00
4	High (60.01 to 80.00 percent)	102	51.00
5	Very high (80.01 to 100.00)	043	21.50
	Total	200	100.00

A look into Table 2 showed that slightly more than half (51.00 percent) farmers of Bhal region had high level of the adaptation related to seasonal crops cultivation followed by

25.00 percent, 21.50 percent and 01.50 percent had medium, very high and low level of the adaptation related to seasonal crops cultivation, respectively. Whereas, only 01.00 percent farmers of Bhal region had very low level of the adaptation related to seasonal crops cultivation.

It could be concluded that majority of farmers of Bhal region had high level of adaptation related to seasonal crops.

Adaptation related to soil and water conservation for field crops:

Soil and water conservation practices that conserve soil moisture in low rainfall areas which enhance infiltration rate while in high rainfall areas, it reduces the soil loss. In both situations, it reduces soil erosion, conserves soil fertility and moisture, and thus improves overall crop productivity. Total nine practices related to soil and water conservation for field crops were included in study and farmers of Bhal region were asked about their behavioral actions undertaken in drought situation to conserve scarce moisture and precious soil. The data pertaining practice wise adaptation strategies followed by them about soil and water conservation for field crops are summarized in Table 3.

Table 3: Practice wise adaptation related to soil and water conservation, (n=200)

Sr.	Strategies	Frequency	Percentage	Rank
1.	Constructed improved bunds to conserve moisture.	146	73.00	II
2	Constructed small section bunds in between main bunds.	151	75.50	I
3	Stabilized the bunds by planting grasses.	127	63.50	IV
4	Leveled the land in between the bunds.	125	62.50	V
5	Dug farm pond to store rain water.	16	08.00	IX
6	Sown the crop across the slope.	124	62.00	VI
7	Adoption of raised bed system for cumin crop	110	55.00	VIII
8	Soil mulching.	120	60.00	VII
9	Applied more FYM.	129	64.50	III

It could be seen from the Table 33 the majority farmers of *Bhal* region the constructed small section bunds in between main bunds (75.50 percent), followed by constructed improved bunds to conserve moisture (73.00 percent), applied more FYM (64.50 percent), stabilized the bunds by planting grasses (63.50 percent), levelled the land in between the bunds (62.50 percent), sown the crop across the slope (62.00 percent), soil mulching (60.00 percent), adoption of raised bed system for cumin crop (55.00 percent) and dug farm pond to store rain water (08.00 percent).

It could be seen from the above table the vast majority farmers of *Bhal* constructed small section bunds in between main bunds and improved bunds to conserve moisture.

The farmers of *Bhal* region were divided into five categories based on their level of overall adaptation related to soil and water conservation for field and data in this regard are presented in Table 4.

Table 4: Level of adaptation strategies related to soil and water conservation, (n=200)

Sr. No.	Category	Frequency	Percent
1	Very low (0.00 to 20.00 percent)	00	00.00
2	Low (20.01 to 40.00 percent)	06	03.00
3	Medium (40.01 to 60.00 percent)	75	37.50
4	High (60.01 to 80.00 percent)	107	53.50
5	Very high (80.01 to 100.00)	12	06.00
	Total	200	100.00

Table 5: Practice wise adaptation related to irrigation (n=200)

Sr.	Strategies	Frequency	Percentage	Rank
1	Dug bore well or open well.	126	63.00	III
2	Diverted inputs of dryland to irrigated area.	132	66.00	II
3	Increase irrigation interval	138	69.00	I
4	Reduced area under irrigation.	121	60.50	IV
5	Well recharge.	60	30.00	VI
6	Irrigated alternate rows.	121	60.50	IV
7	Dug bore well in addition to existing well (s).	115	57.50	V

It could be seen from the Table 5 the majority farmers of *Bhal* region increased irrigation interval (69.00 percent), followed by diverted inputs of dry land to irrigated area (66.00 percent), dug bore well or open well (63.00 percent), reduced area under irrigation and irrigated alternate rows (60.50 percent), dug bore well in addition to existing well (57.50) and well recharge. (30.00 percent).

It could be seen from the above table the majority farmers of *Bhal* region had adapted all the seven practices related to irrigation in drought situation except well recharge.

The farmers of *Bhal* region were distributed into five categories based on their level of adaptation pattern about irrigation in drought situation and data pertaining to this are presented in Table 6.

Table 6: Level of Adaptation related to irrigation, (n=200)

Sr. No.	Category	Frequency	Percent
1	Very low (0.00 to 20.00 percent)	04	02.00
2	Low (20.01 to 40.00 percent)	04	02.00
3	Medium (40.01 to 60.00 percent)	90	45.00
4	High (60.01 to 80.00 percent)	77	38.50
5	Very high (80.01 to 100.00)	25	12.50
	Total	200	100.00

The data presented in Table 4 shows that slightly more than more than half (53.50 percent) farmers of *Bhal* region had high level of the adaptation related to soil and water conservation for field crops followed by 37.50 percent, 06.00 percent and 03.00 percent had medium, very high and low level of the adaptation strategies related to soil and water conservation for field crops, respectively. Wherever, nobody was found in very low level of the adaptation related to soil and water conservation for field crops.

It could be concluded that majority of farmers of *Bhal* region had high level of adaptation strategies related to soil and water conservation for field crops as majority of the soil of *Bhal* region is problematic in nature.

Adaptation related to irrigation

Irrigation helps to grow and save agricultural crops, maintain landscapes, and re-vegetate disturbed soils in dry spell. Irrigation also has other uses in crop production, including frost protection, suppressing weed growth in grain fields and preventing soil consolidation. Total seven practices related to irrigation were identified and studied. Farmers of *Bhal* region were asked about their measures undertaken in drought situation with respect to irrigation. The data pertaining practice wise adaptation followed by the farmers of *Bhal* region related to irrigation are depicted in Table 5.

It can be seen from the Table 6 that more than two third (45.00 percent) farmers of *Bhal* region had medium level of the adaptation related to irrigation, followed by 38.50 percent and 12.50 per had high and very high level of the adaptation strategies related to irrigation, respectively. However, equal percent (02.00 percent) of the farmers of *Bhal* region was found in very low and low level of the adaptation related to irrigation. It could be concluded that great majority (83.50 percent) farmers of *Bhal* region had medium to high level of adaptation strategies related to irrigation as irrigation is the only source for life saving of crops and animals.

Adaptation related to livestock management

Livestock sector occupies a unique position in the socio-economic development of the country and also plays an important role in the rural economy as supplementing family incomes and generating gainful employment in the rural population, particularly among the landless labours, small and marginal farmers. practice wise adaptation strategies related to livestock management in drought situation followed by the farmer was worked out and total fourteen practices were included in this study. The data regarding practice wise adaptation related to livestock management in drought situation is presented in Table 7.

Table 7: Practice wise adaptation related to livestock management (n=200)

Sr.	Strategies	Frequency	Percentage	Rank
1	Sold cattle	95	47.50	XIII
2	Migrated to places where fodder is available.	135	67.50	III
3	Gave supplementary feed to livestock	139	69.50	I
4	Migrated to other irrigated area to carry out agricultural operations for wages.	121	60.50	XI
5	Sent the livestock to gaushala	126	63.00	VI
6	Purchased milch cows or buffalo to earn income.	134	67.00	IV
7	Large animals were replaced by small animals (sheep, goat)	125	62.50	VII
8	Planted improved grass in dry land.	124	62.00	VIII
9	Planted fodder trees to solve fodders problem in long run.	127	63.50	V
10	Rearing of animal on share basis.	122	61.00	X
11	Save fodder for drought period.	136	68.00	II
12	Borrowed fodder during drought from relatives of irrigated areas.	123	61.50	IX
13	Fed the livestock by purchased fodder.	99	49.50	XII
14	Grown fodder crop in a small portion of irrigated area.	125	62.50	VII

It could be seen from the Table 7 the majority farmers of *Bhal* region had adaptation strategies related to livestock management were: given supplementary feed to livestock (69.50 percent), followed by save fodder during normal year for critical year (68.00 percent), migrated to places where fodder is available (67.50 percent), purchased milch cows or buffalo to earn income (67.00 percent), planted fodder trees to solve fodders problem in long run (63.50 percent), sent the livestock to gaushala (63.00 percent), large animals were replaced by small animals (sheep, goat) (62.50 percent), planted improved grass in dry land (62.00 percent), borrowed fodder during drought from relatives of irrigated areas (61.50 percent), rearing of sheep or goat on share basis (61.00

percent), migrated with bullock cart to other irrigated area to carry out agricultural operations for wages (60.50 percent), fed the livestock by purchased fodder (49.50 percent) and sold cattle (47.50 percent).

It could be seen from the Table 37 that the majority farmers of *Bhal* region had modified their pattern in drought situation with respect to all the animal husbandry practices except few like fed the livestock by purchased fodder cent and sold cattle. Farmers of *Bhal* region according to their overall adaptation strategies related to livestock management in drought situation were categories into five groups and data pertaining to this is depicted in Table 8.

Table 8: Level of adaptation related to livestock management (n=200)

Sr. No.	Category	Frequency	Percent
1	Very low (0.00 to 20.00 percent)	06	03.00
2	Low (20.01 to 40.00 percent)	38	19.00
3	Medium (40.01 to 60.00 percent)	121	60.50
4	High (60.01 to 80.00 percent)	35	17.50
5	Very high (80.01 to 100.00)	00	00.00
	Total	200	100.00

It is revealed from the data presented in Table 8 that slightly more than three-fifth (60.50 percent) of the farmers of *Bhal* region had medium level of the adaptation strategies related to livestock management in drought situation followed by 19.00 percent, 17.50 percent and 3.00 percent of them had low, high and very low level of the adaptation strategies related to livestock management in drought situation, respectively. None of the farmers were found in very high level of adaptation strategies related to livestock management. It could be seen from the above table that vast majority farmers of *Bhal* region had medium to high level of adaptation strategies related to livestock management.

Adaptation with respect to land use

Land and water resources are essential for farming, grazing, forestry, infrastructure, and other environmental and economical functions. Farmer may adjust with their land use keeping an eye about various situational factors which occurs due to drought situation. The farmers of *Bhar* region were asked about adaptation strategies followed by them in drought situation in case of their own land use which include seven practices. The practice wise adaptation strategies related to land use are represented in the Table 9.

Table 9: Practice wise adaptation with respect to land use, (n=200)

Sr.	Strategies	Frequency	percentage	Rank
1	Keep a portion of land fallow	164	82.00	I
2	Sold dryland and used money for consumption	127	63.50	III
3	Sold a portion of dryland and converted another portion into irrigated land	25	12.50	VII
4	Gave the land for crop sharing.	81	40.50	VI
5	Leased out dryland.	115	57.50	IV
6	Brought more dryland under cultivation to increase total yield even when rainfall is scarce.	104	52.00	V
7	Intensified the agricultural activities on irrigated land by neglecting dryland.	132	66.00	II

It could be seen from the Table 9 the majority farmers of *Bhal* region kept a portion of land fallow (82.00 percent), followed by intensified the agricultural activities on irrigated land by

neglecting dryland (66.00 percent), sold dryland and used money for consumption (63.50 percent), leased out dryland (57.50 percent), brought more dryland under cultivation to

increase total yield even when rainfall is scarce (52.00 percent) and gave the land for crop sharing (40.50 percent) and sold a portion of dryland and converted another portion into irrigated land (12.50 percent).

Concluding the finding it can be stated that great majority farmers of *Bhal* region had modified their strategy as far as land use in drought situation is concerned and kept a portion of land fallow followed by and intensified the agricultural activities on irrigated land by neglecting dry land.

Table 10: Level of adaptation with respect to their land use (n=200)

Sr. No.	Category	Frequency	Percent
1	Very low (0.00 to 20.00 percent)	09	04.50
2	Low (20.01 to 40.00 percent)	105	52.50
3	Medium (40.01 to 60.00 percent)	70	35.00
4	High (60.01 to 80.00 percent)	16	08.00
5	Very high (80.01 to 100.00)	00	00.00
	Total	200	100.00

As evident from the data in Table 10, slightly more than half (52.50 percent) farmers of *Bhal* region had low level of the adaptation strategies with respect to land use followed by 35.00 percent, 8.00 percent and 4.50 percent had medium, high and very low level of the adaptation strategies with respect to land use, respectively. Nobody was found in very high level of the adaptation strategies with respect to land use. It could be concluded that great majority (87.50 percent) of farmers of *Bhal* region had low to medium level of adaptation strategies related to their land use.

Adaptation strategies with respect to labour use

Farmers of drought affected area had evolved strategies of adaptation to reduce hired labour cost or to increases the self-labour employment to adjust to the acute financial constraints imposed by droughts. The practice wise adaptation strategies related to labour use are represented in the Table 11.

Table 11: Practice wise adaptation strategies with respect to labour use (n=200)

Sr.	Strategies	Frequency	Percentage	Rank
1	Worked a greater number of days in other farms to earn the wage	160	80.00	I
2	Migrated to nearby town to earn wage from non-agricultural works.	120	60.00	VII
3	Migrated to nearby irrigated area to earn wage from agriculture	136	68.00	IV
4	Reduced the number of laborers employed on farm	111	55.50	X
5	Paid wages in kind	141	70.50	II
6	Increased the number of family labourers	127	63.50	VI
7	Family members worked a greater number of hours per day.	133	66.50	V
8	Diversified the labour use from crop to other activities like business, contract etc.	113	56.50	IX
9	Substituted human labour to bullock labour to reduce cost.	119	59.50	VIII
10	Opted for less labour-intensive crop in dryland.	139	69.50	III

It could be seen from the Table 11 the majority farmers of *Bhal* region worked a greater number of days in other farms to earn the wage (80.00 percent) followed by, paid wages in kind (70.50 percent), opted for less labour-intensive crop in dryland (69.50 percent), migrated to nearby irrigated area to earn wage from agriculture (68.00 percent), family members worked a greater number of hours per day (66.50 percent), increased the number of family labourers (63.50 percent), migrated to nearby town to earn wage from non-agricultural works (60.00 percent), substituted human labour to bullock labour to reduce cost (59.50 percent), diversified the labour use from crop to other activities like business, contract etc.

(56.50 percent) and reduced the number of laborers employed on farm (55.50 percent).

As far as adaptation pattern about their labour use is concerned in drought situation. Majority of the farmers of *Bhal* region worked a greater number of days in other farms to earn the wage followed by paid wages in kind, opted for less labor-intensive crop in dryland and migrated to nearby irrigated area to earn wage from agriculture Farmers of *Bhal* region as per their overall level of adaptation strategies related to labour use in drought situation were categorized into five groups and data regarding to this is depicted in Table 12.

Table 12: Level of adaptation strategies with respect to labour use (n=200)

Sr. No.	Category	Frequency	Percent
1	Very low (0.00 to 20.00 percent)	7	03.50
2	Low (20.01 to 40.00 percent)	32	16.00
3	Medium (40.01 to 60.00 percent)	106	53.00
4	High (60.01 to 80.00 percent)	53	26.50
5	Very high (80.01 to 100.00)	2	01.00
	Total	200	100.00

It was observed from Table 12 that, slightly more than half (53.00 percent) farmers of *Bhal* region had medium level of the adaptation with respect to labour use, followed by 26.50 percent, 16.00 percent and 3.50 percent had high, low and very low level of the adaptation strategies with respect to labour use, respectively. However, only 1.00 percent farmers of *Bhal* region had very high level of the adaptation strategies with respect to labour use.

It could be concluded from the table that nearly great majority (79.50 percent) of the farmers of *Bhal* region had medium to high level of adaptation strategies with respect to labour use.

Adaptation strategies with respect to financial management:

The financial management practices of farmers during drought year and also in good years to achieve economic viability during anticipated future droughts are presented in the Table 13.

Table 13: Practice wise adaptation strategies related to financial management, n=200

Sr.	Strategies	Frequency	percentage	Rank
1	Postponed the payment of land revenue taxes.	106	53.00	X
2	Taken loan from money lender.	128	64.00	IV
3	Taken money from relatives for family expenditure.	125	62.50	V
4	Postponed payment of loan installment.	120	60.00	VI
5	Taken loan from GLDB for land development.	117	58.50	VII
6	Taken loan from commercial Bank / GLDB to dig well.	130	65.00	II
7	Taken crop loan from credit cooperative societies.	120	60.00	VI
8	Taken loan for livestock purchase.	132	66.00	I
9	Taken loan for business purpose.	93	46.50	XIII
10	Became beneficiary of rural employment programmes.	128	64.00	IV
11	Became contractor.	110	55.00	IX
12	Became middle or commission agent.	125	62.50	V
13	Joined services	99	49.50	XII
14	Became animal trader	24	12.00	XV
15	Started saving money during normal year for use during drought year.	104	52.00	XI
16	Became a beneficiary of IRDP.	129	64.50	III
17	During a normal year increased investments on cashable assets.	112	56.00	VIII
18	Collected fuel wood from forest and sold	32	16.00	XIV
19	Sold FYM to meet family expenditure.	106	53.00	X

It could be seen from the Table 13 the majority farmers of *Bhal* region had taken loan for livestock purchase (66.00 percent), followed by taken loan from commercial Bank / GLDB to dig well (65.00 percent), became a beneficiary of IRDP (64.50 percent), became beneficiary of rural employment programme (64.00 percent), taken loan from money lender (64.00 percent), became middle or commission agent (62.50 percent) taken money from relatives for family expenditure (62.50 percent), postponed payment of loan instalment (60.00 percent), taken crop loan from credit cooperative societies (60.00 percent), taken loan from GLDB for land development (58.50 percent), during a normal year increased investments on cashable assets (56.00 percent), became contractor (55.00 percent), sold FYM to meet family expenditure (53.00 percent), started saving money during normal year for use during drought year (52.00 percent), joined services (49.50 percent) and taken loan for business purpose (46.50 percent), collected fuel wood from forest and sold (16.00 percent) and became animal trader (12.00 percent). It could be concluded that the majority farmers of *Bhal* region had taken loan for livestock purchase and to dig well and became beneficiary of IRDP as well as other rural employment programmes to manage their finance in drought situation. Farmers of *Bhal* region as per their overall level of adaptation strategies related to financial management in drought situation were categorized into five groups and data regarding to this is depicted in Table 14.

Table 14: Level of adaptation strategies related to financial management (n=200)

Sr. No.	Category	Frequency	Percent
1	Very low (0.00 to 20.00 percent)	00	00.00
2	Low (20.01 to 40.00 percent)	29	14.50
3	Medium (40.01 to 60.00 percent)	98	49.00
4	High (60.01 to 80.00 percent)	73	36.50
5	Very high (80.01 to 100.00)	00	00.00
	Total	200	100.00

The findings shown in Table 14 make it clear that, nearly half (49.00 percent) farmers of *Bhal* region had medium level of the adaptation strategies related to financial management, followed by 36.50 percent and 14.50 percent farmers of *Bhal* region had high and low level of adaptation strategies related to financial management, respectively.

It could be concluded from the table that great majority of the farmers of *Bhal* region had medium to high level of adaptation strategies related to financial management as drought badly hits financial activities and this might be the possible cause for medium to high level of adaptation.

Adaptation strategies related to family

Family labour force of the agricultural holding refers to family workers. The item wise adjustment made by the farmers within their family to thrive better during drought situation is depicted in Table 15.

Table 15: Practice wise adaptation related to family, (n=200)

Sr.	Strategies	Frequency	Percentage	Rank
1	Discontinued the schooling of one or two children.	60	30	IX
2	Postponed the marriage of their children.	70	35	VII
3	Eat only once a day	09	4.50	X
4	Stopped overspending in social functions and festivals.	141	70.5	II
5	Reduced spending on costly food items.	150	75	I
6	Borrowed food grains from relatives.	112	56	V
7	Borrowed money on jewelry.	132	66	III
8	Sold jewelry for want of money during drought year.	117	58.5	IV
9	Borrowed money from employed son(s).	87	43.5	VI
10	Sold agricultural implements and utensils	67	33.50	VIII

It could be seen from the Table 15 the majority farmers of *Bhal* region reduced spending on costly food items (75.00 percent), followed by stopped overspending in social

functions and festivals (70.50 percent), borrowed money on jewellery (66.00 percent) and sold jewellery for want of money during drought year (58.50 percent), borrowed food

grains from relatives (56.00 percent), borrowed money from employed son(s) (43.50 percent), postponed the marriage of their children (35.00 percent), sold agricultural implements and utensils (33.50 percent), discontinued the schooling of one or two children (30.00 percent) and eat only once a day (04.50 percent)

It could be concluded from the above table that majority of farmers of *Bhal* region had reduced spending on costly food items (75.00 percent, followed by stopped overspending in social functions and festivals (70.50 percent), borrowed money on jewellery (66.00 percent) and sold jewellery for want of money during drought year (58.50 percent) respectively.

Table 16: Level of adaptation strategies related to family (n=200)

Sr. No.	Category	Frequency	Percent
1	Very low (0.00 to 20.00 percent)	04	02.00
2	Low (20.01 to 40.00 percent)	54	27.00
3	Medium (40.01 to 60.00 percent)	110	55.00
4	High (60.01 to 80.00 percent)	32	16.00
5	Very high (80.01 to 100.00)	00	00.00
	Total	200	100.00

From Table 46, it is observed that, slightly more than half (55.00 percent) farmers of *Bhal* region had medium level of the adaptation strategies related to family, followed by 27.00 percent, 16.00 percent and 2.00 percent had low, high and very low level of the adaptation strategies related to family, respectively. Nobody was found in very high level of the adaptation strategies related to family.

It could be concluded from the table that great majority (82.00 percent) farmers of *Bhal* region had medium to low level of the adaptation strategies related to family.

Table 17: Farmers according to their overall adaptation strategies followed related to drought situation, (n = 200)

Sr. No.	Categories with score	Frequency	Percent
1	Very low (0.00 to 20.00 percent)	00	00.00
2	Low (20.01 to 40.00 percent)	09	04.50
3	Medium (40.01 to 60.00 percent)	133	66.50
4	High (60.01 to 80.00 percent)	58	29.00
5	Very high (80.01 to 100.00)	00	00.00
	Total	200	100.00

A cursory glance at Table 17 indicated that two- third (66.50 percent) farmers of *Bhal* region were observed with the medium level of the overall adaptation strategies related to drought situation, followed by 29.00 percent and 4.50 percent were in high and low level of the overall adaptation strategies related to drought situation, respectively. Nobody was found in very low and very high level of adaptation strategies.

It could be concluded from the above table that more than great majority (95.50 percent) farmers of *Bhal* region had medium to high level of adaptation strategies related to drought situation.

Conclusion

In nutshell, around two- third (66.50 percent) farmers of *Bhal* region were had medium level of the overall adaptation related to drought situation, followed by 29.00 percent and 4.50 percent had high and low level of the overall adaptation level related to drought situation, respectively. Nobody was found in very low and very high level of adaptation level. It means that majority of the farmers of *Bhal* region had adopted majority of the practices related to seasonal crops, soil and

water conservation, irrigation, livestock management, land and labour use, financial management and family to mitigate crisis related to drought.

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