

State: UTTARAKHAND
Agriculture Contingency Plan for District: Rudraprayag

1.0	District Agriculture profile		
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Western Himalayas, warm subhumid (to humid with inclusion of perhumid) ecoregion (14.2)	
	Agro -Climatic Region (Planning Commission)	Western Himalayan Region (I)	
	Agro –Climatic Zone (NARP)*	AZ27, Mid Hills	
	List all the district falling under the NARP Zone	Nainital, Udham Singh nagar, Haridwar, Dehradun, Almora, Pithoragarh, Chamoli, Champawat, Bageshwar, Pauri, Tehri, Uttarkashi	
	Geographic Coordinates of district	Latitude 30 ⁰ N	Longitude 78 ⁰ E Altitude 610-3500m above MSL
	Name and address of the concerned ZRS/ ZARS/RARS/RRS/RRTTS	Dr A K Singh, Zonal Project Director, GT Road, Rawatpur, Near Vikas Bhawan, Kanpur 0512-2550927(O)	
	Mention the KVK located in the district	KVK, Jakhdhara, Via Guptkashi Distt.-Rudra Prayag-246439 Dr. V. B. Singh, Programme Coordinator, Ph: 7500241510, 09410104959, kvkjakh@rediffmail.com	
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Dr H S Kushwaha, Professor, Agro meteorology, GBPUA &T, Pantnagar-263145 U S Nagar (UK) India	

1.2	Rainfall	Average (mm)	Normal Onset (Specify week and month)	Normal Cessation (Specify week and month)
	SW monsoon (June-Sep)	1810	2 nd week of June	4 th week of September
	NE Monsoon (Oct.-Dec.)	55.4		
	Winter (Jan-March)	140.0		
	Summer (Apr-May)	104.6		
	Annual	2110		

1.3	Land use pattern of the district (latest statistics)	Geographical area	Forest area	Land under non-agriculture use	Permanent pastures	Cultivable wasteland	Land under Misc tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area (000 ha)	23542100	17989500	800800	430800	300400	1160000	725700	68600	68000

* <http://rudraprayag.nic.in/pages/display/170-statistical-handbook-2009>

1.4	Major Soils	Area ('000 ha)	Percent (%) of total
	Brown forest soils and residual sandy loam (Acidic, rocky, stone & gravels with poor moisture regime)		

* Data source: Soil Resource Maps of NBSS & LUP, estimated values

1.5	Agricultural land use	Area (000 ha)	Cropping intensity %
	Net sown area	19.5	143.6
	Area sown more than once	8.5	
	Gross cropped area	28.0	

* <http://rudraprayag.nic.in/pages/display/170-statistical-handbook-2009>

1.6	Irrigation	Area ('000ha)/ Number	Percent (%)	
	Pump set			
	Lift irrigation			
	Micro-irrigation			
	Gross water availability and use	Area	% area	Quality of water
	Irrigated area	2413	12.4	
	Rainfed area	17961	87.6	
	Sources of irrigation	Number	Area ('000ha)	% area
	Canal		1.555	64.4
	Open wells			
	Bore wells			
	Others (Lift pump, Water storage tank, Irrigation channel)		0.85	35.6

* <http://rudraprayag.nic.in/pages/display/170-statistical-handbook-2009>

Area under major field crops & horticulture etc.

1.7	Major field crops cultivated	Total area	Irrigated Area (000 ha)*	Rainfed
Kharif				
Cereals				
	Paddy	10.4		
	Fingermillet	6.3		
	Barnyard millet	3.2		
	Maize	0.2		
	Amaranthus	0.2		
Pulses				
	Black Gram	0.4		
	Horse Gram	0.2		
	Pigeon Pea	0.2		
	French bean	0.2		
	Soybean(Black)	0.1		
Oil Seeds				
	Soybean	0.160		
	Sesame	0.02		
Rabi				
Cereals				
	Wheat	12.8		
	Barley	1.1		
Pulses				
	Gram	0.02		
	Pea	0.08		
	Lentil	0.07		
Oil Seeds				
	Mustard	0.3		
Horticulture crops-Fruits				
	Temperate Fruits(Apple, Plum, Pear, Peach etc)	0.8		
	Citrus (Malta, orange etc.)	0.6		
	Dry Fruits (Walnut, Almond etc.)	0.2		
	Others(Mango, Litchi, Guava, Anar etc.)	0.8		
Other Horticultural crops				
	Vegetables	1.5		
	Spices	0.4		
	Flowers	0.02		
Medicinal & Aromatic plants		0.02		
Grazing land		6.6		

* <http://rudraprayag.nic.in/pages/display/170-statistical-handbook-2009>

1.8	Livestock	Number		
	Cattle	Dairy-54522, plough animals- 48184		
	Buffaloes	36012		
	Commercial dairy farms	Nil		
	Goat	39726		
	Sheep	15636		
	Others (Rabbit, Horse & ponnies, mules etc.)	1912		
1.9	Poultry (commercial + Backyard)	5606		
1.10	Inland Fisheries	Area (ha)	Yield (t/ha)	Production (tones)
	Brackish water			
	Fresh water			
	Others			

* <http://rudraprayag.nic.in/pages/display/170-statistical-handbook-2009>

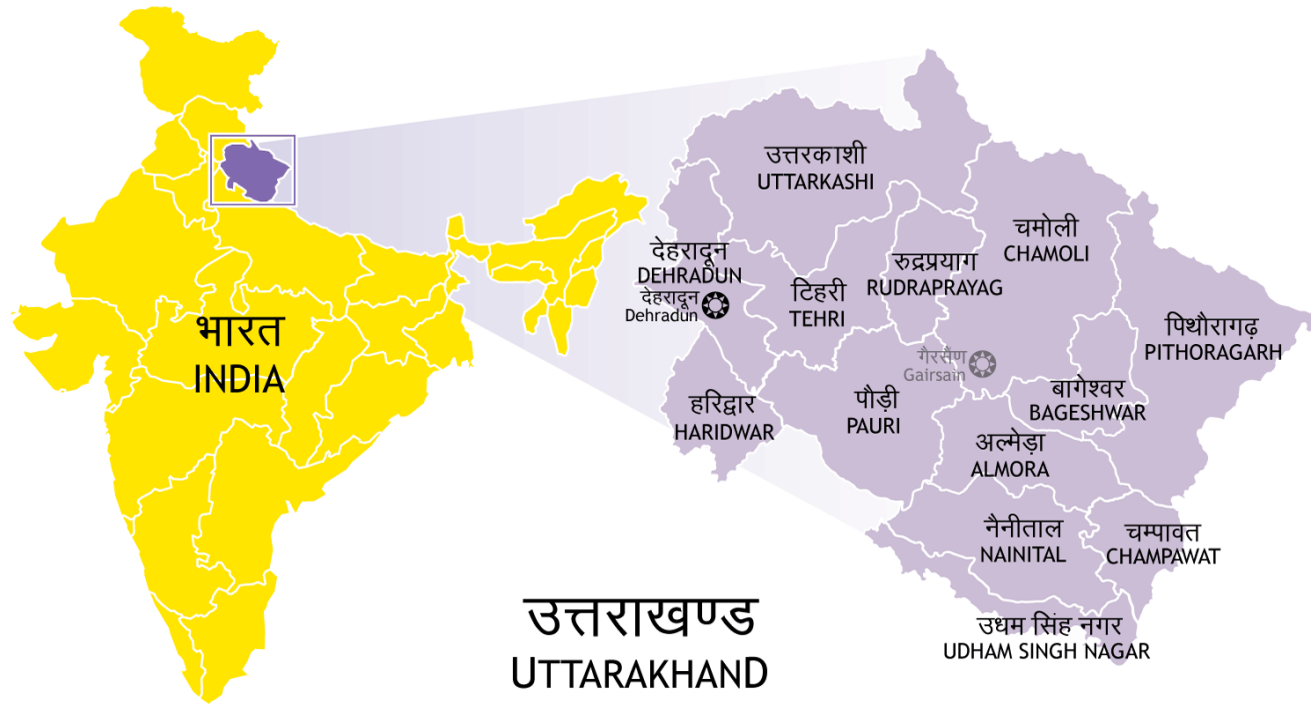
1.11	Production and Productivity of major crops (Average of last 3 years: 2006, 07, 08)	Kharif		Rabi		Summer		Total	
		Production (MT)	Productivity (Qt/ha)	Production (MT)	Productivity (Qt/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
Kharif									
	Paddy	13947	13.10					13947	13.10
	Fingermillet	7881	14.61					7881	14.61
	Maize	242.25	12.75					242.25	12.75
	Barnyard millet	4082	12.15					4082	12.15
	Blackgram	82	2.27					82	2.27
	Horse gram	132	6.90					132	6.90
	Kidney bean	77	9.14					77	9.14
	Soybean	130.61	19.79					130.61	19.79
	Sesame	7	1.63					7	1.63
	Wheat			12849	12.05			12849	12.05
	Barley			1906	1.4			1906	1.4
	Gram			1.5	7.5			1.5	7.5
	Pea			42	7.5			42	7.5
	Lentil			11	4.5			11	4.5
	Toria			125	5.77			125	5.77
1.12	Sowing window (start and end)								

of sowing period)	1:Paddy DSR	2:Finger millet	3: Horse gram	4:Wheat	5:Toria
Kharif-Rainfed	4 th week of March to 4 th week of April	4 th week of May to 2 nd week of June	4 th week of May to 2 nd week of June	-	-
Kharif-Irrigated	-	-	-	-	-
Rabi-Rainfed	-	-	-	2 nd week of October to 2 nd week of November	2 nd week of October to 2 nd week of November
Rabi-Irrigated	-	-	-	-	-

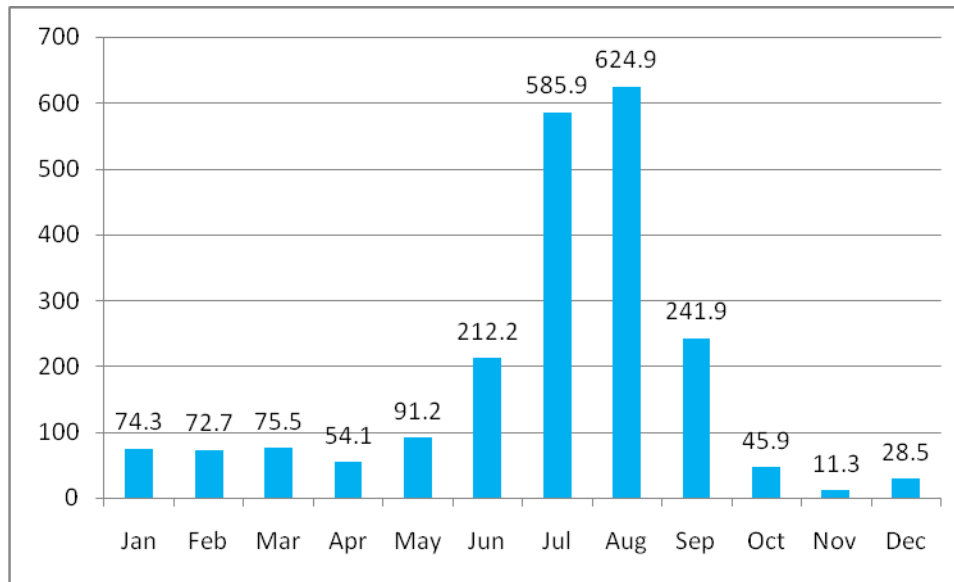
* <http://rudraprayag.nic.in/pages/display/170-statistical-handbook-2009>

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular			Sporadic (specify month of occurrence in brackets)			None
		Severe	Moderate	Mild	Severe	Moderate	Mild	
	Drought		✓					
	Flood		-					✓
	Cyclone		-					✓
	Hail storm		✓					
	Heat wave							✓
	Cold wave	✓		-				
	Frost			✓				
	Sea water inundation							✓
	Pests and diseases (specify)	Fruit fly of guava, mango, tomato and cucurbits, brown plant hopper, stem borer and leaf folder of rice, powdery mildew and leaf miner of peas, rhizome rot of ginger, buckeye rot of tomato, brown and false smut of rice, loose smut of wheat, Erwinia stalk rot, maydis leaf blight in maize, yellow rust and Karnal bunt in wheat			Rice hispa, wheat aphid, mustard aphid, cabbage butter fly of mustard and maize stem borer, aphids and white fly of cole crops mealy bug and hoppers of mango, blast and bacterial leaf blight Brown leaf spot ,false smut in rice, bacterial stalk rot and leaf sheath blight of maize, Late and early blight of potato, yellow rust, loose smut and covered smut of wheat and barley, alternaria blight and white rust of mustard, powdery and downy mildew of cucurbits, stalk rot of cole crops, bacterial wilt and phytophthora blight of Solanaceous crops, Yellow rust, helminthosporium leaf blight in barley			
1.14	Include Digital maps of the district for				Location map of district with in State as Annexure 1			Enclosed: Yes
					Soil map as Annexure 2			Enclosed: Yes
					Mean annual rainfall as Annexure 3			Enclosed: No

Annexure 01 : Location map of the Uttarakhand state and district Rudraprayag



Annexure 02 : Mean annual rainfall (mm) of district Rudraprayag



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Early season drought (delayed onset)	Major Farming situation ^a	Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 2 weeks 4 th week of June	(1) Tropical climate with moderately high temperature (18-30 ^o C), medium rainfall, low humidity, Irrigated Valley/low hill, High rainfall and Alluvial sandy soil, in nature	Paddy-wheat	Finger millet(VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2) -wheat Barnyard millet (VL Madira-172)-wheat Paddy-wheat	a) Use of short duration varieties. b) Gap filling with improved seeds. c) Timely weed control. d) Plough the field just after harvesting of kharif crop. e) Conserve residual moisture for sowing of rabi crop	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building.
		Tomato/Brinjal/Chillies- Wheat/Barley /Torla/Potato/Onion/ Garlic	No Change	a) Use of life saving irrigation b) Delayed transplanting c) Use of FYM and mulches to conserve moisture d) Use of bioinoculants like <i>Trichoderma</i>	Public –private partnership taking advantage of Corporate Social Responsibility.
	(2) Rainfed valley/Low hill, undulating topography, Moderate rainfall and Silty sandy soil	Rainfed Paddy / Finger millet / Barnyard millet / Maize /Black Gram /Red Gram/Horse Gram/ Frenchbean,- Wheat/Torla/Potato/Barley/ Rai,/Lentil/Buckwheat	No Change	a) Use of short duration varieties. b) Gap filling with improved seeds. c) Timely weed control. d) Plough the field just after harvesting of kharif crop. e) Conserve residual moisture for sowing of rabi crop	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building.
		Rainfed Paddy / Finger millet / Barnyard millet / Maize-Fallow-Rainfed Paddy / Finger millet /	No Change	a) Use of life saving irrigation b) Delayed transplanting c) Use of FYM and mulches to conserve moisture d) Use of bioinoculants like	Public –private partnership taking advantage of Corporate Social Responsibility.

		Barnyard millet / Maize		<i>Trichoderma</i>	
		Fallow- Wheat/Toria/Potato/B arley	No Change		
(3) South facing mid hills, low rainfall, dry receiving maximum sunlight, agricultural activities are being taken in terrace fields and this situation is mostly dry due to high duration & intensity of sunlight and silty sandy soil		Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean- Barley/ Lentil & Mustard/ Wheat/Toria/Potato/ Radish	No Change	a) Use of short duration varieties. b) Gap filling with improved seeds. c) Timely weed control. d) Plough the field just after harvesting of kharif crop. e) Conserve residual moisture for sowing of rabi crop	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
		Horse gram/ Urd/ Arhar+Barnyard Millet	No Change		
		Rainfed Horse gram/Urd- Wheat/Barley	No Change		
		Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean- Fallow- Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean	No Change		
(4) North facing mid hills, moderate rainfall, agricultural activities are being taken in terrace fields and this situation is comparatively cool & moist due to less intensity of sunlight		Irrigated Paddy /Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/ Arhar) /Barnyard millet, (Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato -	No Change	a) Use of short duration varieties. b) Gap filling with improved seeds. c) Timely weed control. d) Plough the field just after harvesting of kharif crop. e) Conserve residual moisture for sowing of rabi crop	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building

	and more number of perennial springs and silty sandy soil	Wheat/Toria/Potato/Barley/Mustard/Radish			
		Rainfed Horse gram/Urd/ Soyabean-Wheat/Barley	No Change		
		Fallow-Wheat/Toria/Potato/Barley/Mustard/Radish	No Change		
(5)	High hills, high rainfall, agricultural activities are being taken in terrace fields and clay loam	Rainfed Paddy/Finger millet/Sanwa/ Tomato /Amaranthss/ Rajma -Barley / Potato / Wheat/ Rapeseed/ Cabbage/ Potato/Pea/ Radish.	No Change	<ul style="list-style-type: none"> a) Use of short duration varieties. b) Gap filling with improved seeds. c) Timely weed control. d) Plough the field just after harvesting of kharif crop. e) Conserve residual moisture for sowing of rabi crop 	<ul style="list-style-type: none"> a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
(6)	Very high hills, very high rainfall, climate is of humid temperate type with low to very low annual mean temperature. The snowfall is high., mountainous topography and clay loam soil	Rainfed Paddy/ Arbi /Finger millet/Barnyard millet/Amaranthss-Wheat/Buckwheat/Pea/Cole Crop/ Cabbage/ Barley/Potato	No Change	<ul style="list-style-type: none"> a) Use of short duration varieties. b) Gap filling with improved seeds. c) Timely weed control. d) Plough the field just after harvesting of kharif crop. e) Conserve residual moisture for sowing of rabi crop 	<ul style="list-style-type: none"> a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building

Early season drought (delayed onset)	Major Farming situation ^a	Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	
Delay by 4 weeks 2 nd week of July	(1) Tropical climate with moderately high temperature (18-30 ⁰ C), medium rainfall, low	Irrigated & rain fed Paddy /Finger millet/Barnyard millet/Maize-Wheat/Toria/Wheat+ Toria/Potato/Onion/G	Finger millet (VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2) /Barnyard millet (VL Madira-172)-	Use of short duration ,rainfed varieties Change of Crop, Use failed crop as fodder, addition of organic manures (FYM/compost) @ 5-10 t/ha	<ul style="list-style-type: none"> a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm

	humidity, Irrigated Valley/low hill, High rainfall and Alluvial sandy soil,in nature	arlic/Barley	Wheat/Toria/Wheat+Toria/Potato/Onion/Garlic/Barley	treated with <i>Trichoderma</i> Addition of organic manures (FYM/compost) @ 5-10 t/ha treated with <i>Trichoderma</i> , Sowing may be delayed till appropriate soil moisture condition reaches	machineries. c) Capacity building
		Tomato/Brinjal,/Chillies- Wheat/Barley /Toria/Potato/Onion/ Garlic	Fallow- Wheat/Barley /Toria/Potato/Onion/Garlic		
(2)	Rainfed valley/Low hill, undulating topography, Moderate rainfall and Silty sandy soil	Rainfed Paddy / Finger millet / Barnyard millet / Maize /Black Gram /Red Gram/Horse Gram/ Frenchbean,- Wheat/Toria/Potato/Barley/ Rai,/Lentil/Buckwheat	Finger millet (VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2)/ Barnyard millet (VL Madira-172)/Black Gram (U-31, 35) /Red Gram/Horse Gram- Wheat/Toria/Potato/Barley/ Rai/Lentil/Buckwheat	Use of short duration ,rainfed varieties	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
		Rainfed Paddy / Finger millet / barnyard millet / Maize-Fallow- Rainfed Paddy / Finger millet / Barnyard millet / Maize	Finger millet (VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2)/ Barnyard millet (VL Madira-172)-Fallow- Rainfed Paddy / Finger millet / Barnyard millet / Maize		
		Fallow- Wheat/Toria/Potato/Barley	Fallow- Wheat/Toria/Potato/Barley		
(3)	South facing mid hills,low rainfall,dry receiving maximum sunlight, agricultural	Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranthss/ Sesamum/ Soybean-	Finger Millet(VL Mandua 315, 324)/ Barnyard Millet (VL 29, VL 21, VL Madira 172, PRJ 1)/Amaranth PRA 123,	Use of short duration ,rainfed varieties Change of crops, use failed crop as fodder, Increased seed rate,	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting

activities are being taken in terrace fields and this situation is mostly dry due to high duration & intensity of sunlight and silty sandy soil	Barley/ Lentil & Mustard/ Wheat/Toria/Potato/ Radish	VL Chua / Sesamum/ Soybean- Barley/ Lentil & Mustard/Wheat/Toria/Potato / Radish	Intercropping, Timely weeding	hill based farm machineries. c) Capacity building
	Horse gram/ Urd/ Arhar+Barnyard Millet	Horse gram VLG1, VLG 8, VLG 10/ Urd/ Arhar+Barnyard Millet		
	Rainfed Horse gram/Urd- Wheat/Barley	Rainfed Horse gram/Urd- Wheat/Barley		
	Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranthss/ Sesamum/ Soybean- Fallow- Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean	Finger Millet(VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2)/ Barnyard Millet(VL Madira-172)/ Amaranths/ Sesamum/ Soybean- Fallow- Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths PRA 123, VL Chua / Sesamum/ Soybean		
(4) North facing mid hiolls, moderate rainfall, agricultural activities are being taken in terraced fields and this situation is comparatively cool & moist due to less intensity of sunlight and more number of perennial springs and silty sandy soil	Irrigated Paddy /Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/ Arhar) /Barnyard millet+ (Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato - Wheat/Toria/Potato/B arley/Mustard/Radish	Finger millet/(VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2)Finger millet+(Horse gram/ Urd/ Arhar) /Barnyard millet(VL Madira-172)+ (Horse gram/Urd/Arhar) / Amaranths/PRA 123, VL Chua 44 Sesamum - Wheat/Toria/Potato/Barley/ Mustard/Radish	Use of short duration ,rainfed varieties Change of crops, use failed crop as fodder, Increased seed rate, Intercropping, Timely weeding	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building

		Rainfed Horse gram/Urd/Soyabean-Wheat/Barley	Rainfed Horse gram VLG1, VLG 8, VLG 10//Urd/Soyabean-Wheat/Barley		
		Rainfed Paddy/Finger millet/Finger millet+(Horse gram/Urd/Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranthss/ Sesamum/Tomato – Fallow- Rainfed Paddy/Finger millet/Finger millet+(Horse gram, Urd, Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato	Finger millet(VLM 146, VLM 149, VLM 315, VLM 324, PRM 1, PRM 2)/Finger millet+(Horse gram VLG1, VLG 8, VLG 10// Urd/Arhar) /Barnyard millet(VL Madira-172), Horse gram/Urd/Arhar) / Amaranths PRA 123, VL Chua 44/ Sesamum –Fallow- Rainfed Paddy/Finger millet/Finger millet+(Horse gram, Urd, Arhar) /Barnyard millet + Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato		
		Fallow-Wheat/Toria/Potato/Barley/Mustard/Radish	Fallow-Wheat(VL-829, HPW-251)//Toria(Bhawani)/Potato /Barley/Mustard/Radish		
(5) High hills, high rainfall, agricultural activities are being taken in terrace fields and clay loam		Rainfed Paddy/Finger millet/Barn Yard millet/ Tomato /Amaranths/ Rajma - Barley / Potato / Wheat/ Rapeseed/ Cabbage/ Potato/Pea/ Radish.	Finger millet/Sanwa//Amaranths/ Rajma -Barley / Potato / Wheat/ Rapeseed/ Cabbage/ Potato/Pea/ Radish.	Use of short duration ,rainfed varieties	
(6) Very high hills, very high rainfall, climate is of humid temperate type with low to very low annual mean		Rainfed Paddy/ Arbi /Finger millet/Barnyard millet/Amaranths- Wheat//Buckwheat/Pea/Cole Crop/	Finger millet/Barnyard millet/Amaranths- Wheat(VL-829, HPW-251)//Buckwheat/Pea/Cole Crop/ Cabbage/ Barley/(HBL-276)Potato	Use of short duration ,rainfed varieties	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm

	temperature. The snowfall is high., mountainous topography and clay loam soil	Cabbage/ Barley/Potato			machineries. c) Capacity building
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Early season drought (delayed onset)	Major Farming situation ^a	Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 6 weeks 4 th week of July	(1) Tropical climate with moderately high temperature (18-30 ⁰ C), medium rainfall, low humidity, Irrigated Valley/low hill, High rainfall and Alluvial sandy soil,in nature	Irrigated/Paddy /Finger millet/Barnyard millet/Maize-Wheat/Toria/Wheat+ Toria/Potato/Onion/G arlic/Barley	Finger millet/Barnyard millet- Wheat/Toria/Wheat+Toria// Barley	Use of short duration , rainfed, late sown varieties, mulching ,tillage and weed control	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
		Tomato/Brinjal,/Chill ies- Wheat/Barley /Toria/Potato/Onion/ Garlic	Fallow- Wheat(VL-829, HPW-251)//Barley HBL-276)/Toria (Bhawani)		
	(2) Rainfed valley/Low hill, undulating topography,Moderate rainfall and Silty sandy soil	Rainfed Paddy / Finger millet / Barnyard millet / Maize /Black Gram /Red Gram/Horse Gram/ Frenchbean,- Wheat/Toria/Potato/B arley/ Rai,/Lentil/Buckwhea t	Finger millet / Barnyard millet /Black Gram /Red Gram/Horse Gram,- Wheat/Toria(Bhawani)/Barley/ Rai,/Lentil/Buckwheat	Use of short duration , rainfed, late sown varieties, mulching ,tillage and weed control Use	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
		Rainfed Paddy / Finger millet / Barnyard millet / Maize-Fallow- Rainfed Paddy / Finger millet / Barnyard millet / Maize	Finger millet / Barnyard millet -Fallow- Rainfed Paddy / Finger millet / Barnyard millet / Maize		

		Fallow- Wheat/Toria/Potato/B arley	Fallow-Wheat/Toria/Barley HBL-276)		
(3) South facing mid hills, low rainfall, dry receiving minimum sunlight, agricultural activities are being taken in terrace fields and this situation is mostly dry due to high duration & intensity of sunlight and silty sandy soil		Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean- Barley/ Lentil & Mustard/ Wheat/Toria/Potato/ Radish	Finger Millet/ Barnyard Millet/Amaranths/ Sesamum/ Soybean- Barley/ Lentil & Mustard/Wheat/Toria (Bhawani)	Use of short duration , rainfed, late sown varieties, mulching ,tillage and weed control Use	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
		Horse gram/ Urd/ Arhar+Barnyard Millet	Horse gram/ Urd/ Arhar+Barnyard Millet		
		Rainfed Horse gram/Urd- Wheat/Barley	Rainfed Horse gram/Urd- Wheat(VL-829, HPW- 251)//Barley		
		Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean- Fallow- Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean	Finger Millet/ Barnyard Millet/ Amaranths/ Sesamum - Fallow- Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean		
(4) North facing mid hills, moderate rainfall, agricultural activities are being taken in terrace fields and this situation is comparatively cool & moist due to less intensity of sunlight and more number of perennial springs and		Irrigated Paddy /Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/ Arhar) /Barnyard millet, (Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato - Wheat/Toria/Potato/B arley/Mustard/Radish	Finger millet/Finger millet+(Horse gram/ Urd/ Arhar) /Barnyard millet, (Horse gram/Urd/Arhar) / Amaranths/ Sesamum - Wheat(VL-829, HPW- 251)//Toria /Barley/Mustard	Use of short duration , rainfed, late sown varieties, mulching ,tillage and weed control Use	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building

	silty sandy soil	Rainfed Horse gram/Urd/Soyabean-Wheat/Barley	Rainfed Horse gram/Urd/Soyabean-Wheat/Barley HBL-276)		
		Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato – Fallow- Rainfed Paddy/Finger millet/ Finger millet+(Horse gram, Urd, Arhar) /Barnyard millet, Horse gram/ Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato	Finger millet/Finger millet+(Horse gram/ Urd/Arhar) /Barnyard millet, Horse gram/Urd/Arhar) / Amaranths/ Sesamum – Fallow- Finger millet/Finger millet+(Horse gram, Urd, Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum		
		Fallow- Wheat/Toria/Potato/Barley/Mustard/Radish	Fallow-Wheat(VL-829, HPW-251)//Toria/Potato/Barley/Mustard/Radish (Pusa Chetki, Pusa Himani)		
(5)	High hills, high rainfall, agricultural activities are being taken in terrace fields and clay loam	Rainfed Paddy/Finger millet/Sanwa/ Tomato /Amaranths/ Rajma -Barley / Potato / Wheat/ Rapeseed/ Cabbage/ Potato/Pea/ Radish.	Finger millet/Sanwa//Amaranths/ Rajma - Wheat/ Rapeseed/ Barley HBL-276)/	Use of short duration , rainfed, late sown varieties,mulching ,tillage and weed control Use	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building

	(6) Very high hills, very high rainfall, climate is of humid temperate type with low to very low annual mean temperature. The snowfall is high., mountainous topography and clay loam soil	Rainfed Paddy/ Arbi /Finger millet/Barnyard millet/Amaranths- Wheat/Buckwheat/Pea/Cole Crop/ Barley/Potato	Finger millet/Barnyard millet/Amaranths- Wheat/ (VL-829, HPW-251)/Buckwheat/Pea/Cole Crop/ Barley HBL-276)/Potato	Use of short duration , rainfed, late sown varieties, mulching ,tillage and weed control Use	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
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Early season drought (delayed onset)	Major Farming situation ^a	Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 8 weeks 2nd week of August	(1) Tropical climate with moderately high temperature (18-30 ⁰ C), medium rainfall, low humidity,Irrigated Valley/low hill, High rainfall and Alluvial sandy soil,in nature	Irrigated/Paddy /Finger millet/Barnyard millet/Maize- Wheat/Toria/Wheat+ Toria/Potato/Onion/G arlic/Barley Tomato/Brinjal,/Chill ies- Wheat/Barley /Toria/Potato/Onion/ Garlic	Fallow- Wheat/Toria/Wheat+Toria// Barley Fallow- Wheat/Barley /Toria	Use of short duration , Rainfed varieties, mulching ,tillage and weed control Left the field fallow in the kharif Resowing/ Gap filling with higher (15-20%)_Seed Rate Wider Spacing_by (10-20%) Regular weeding Scientific use of chemical fertilizers based on soil test Maintenance of soil cover Addition of high doses of FYM 1-2 tonnes /ha and organic manures Intercropping with legumes Thinning	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building

				(5-10%) Ridge and furrow cultivation	
(2) Rainfed valley/Low hill, undulating topography, Moderate rainfall and Silty sandy soil	Rainfed Paddy / Finger millet / Barnyard millet / Maize /Black Gram /Red Gram/Horse Gram/ Frenchbean,- Wheat/Toria/Potato/Barley/ Rai,/Lentil/Buckwheat	Fallow- Wheat/Toria/Barley/ Rai,/Lentil/Buckwheat		Use of short duration , Rainfed varieties, mulching ,tillage and weed control Left the field fallow in the kharif Resowing/ Gap filling with higher (15-20%)_Seed Rate Wider Spacing by (10-20%) Regular weeding Scientific use of chemical fertilizers based on soil test Maintenance of soil cover Addition of high doses of FYM 1-2 tonnes /ha and organic manures Intercropping with legumes Thinning (5-10%) Ridge and furrow cultivation	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
	Rainfed Paddy / Finger millet / Barnyard millet / Maize-Fallow- Rainfed Paddy / Finger millet / Barnyard millet / Maize				
	Fallow- Wheat/Toria/Potato/Barley				
(3) South facing mid hills,low rainfall,dry receiving mainmum sunlight, agricultural activities are being taken in terrace fields and this situation is mostly dry due to high duration & intensity of sunlight and silty sandy soil	Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean- Barley/ Lentil & Mustard/ Wheat/Toria/Potato/ Radish	Fallow- Barley/ Lentil & Mustard/Wheat/Toria		Use of short duration , Rainfed varieties, mulching ,tillage and weed control Left the field fallow in the kharif Resowing/ Gap filling with higher (15-20%)_Seed Rate Wider Spacing by (10-20%) Regular weeding Scientific use of chemical fertilizers based on soil test Maintenance of soil cover Addition of high doses of FYM 1-2 tonnes /ha and organic manures Intercropping with legumes Thinning (5-10%)	a) . Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
	Horse gram/ Urd/ Arhar+Barnyard Millet				
	Rainfed Horse gram/Urd- Wheat/Barley	Fallow-Wheat/Barley/Lentil			
	Finger Millet/ Barnyard Millet/				

		Maize/ Tomato Amaranths/ Sesamum/ Soybean- Fallow- Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean		Ridge and furrow cultivation	
(4) North facing mid hiolls, moderate rainfall, agricultural activities are being taken in terrace fields and this situation is comparatively cool & moist due to less intensity of sunlight and more number of perennial springs and silty sandy soil		Irrigated Paddy /Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/ Arhar) /Barnyard millet, (Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato - Wheat/Toria/Potato/B arley/Mustard/Radish	Fallow-Wheat/Toria /Barley/Mustard/Lentil	Use of short duration , Rainfed varieties, mulching ,tillage and weed control Left the field fallow in the kharif Resowing/ Gap filling with higher (15-20%)_Seed Rate Wider Spacing by (10-20%) Regular weeding Scientific use of chemical fertilizers based on soil test Maintenance of soil cover Addition of high doses of FYM 1-2 tonnes /ha and organic manures Intercropping with legumes Thinning (5-10%) Ridge and furrow cultivation	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
		Rainfed Horse gram/Urd/Soyabean- Wheat/Barley			
		Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato – Fallow- Rainfed Paddy/Finger millet/Finger millet+(Horse gram, Urd, Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato			

		Fallow- Wheat/Toria/Potato/B arley/Mustard/Radish			
(5) High hills, high rainfall, agricultural activities are being taken in terrace fields and clay loam		Rainfed Paddy/Finger millet/Barnyard millet/ Tomato /Amaranths/ Rajma - Barley / Potato / Wheat/ Rapeseed/ Cabbage/ Potato/Pea/ Radish.	Fallow - Wheat/ Rapeseed/ Barley/	Use of short duration , Rainfed varieties,mulching ,tillage and weed control	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
(6) Very high hills, very high rainfall, climate is of humid temperate type with low to very low annual mean temperature. The snowfall is high., mountainous topography and clay loam soil		Rainfed Paddy/ Arbi /Finger millet/Barnyard millet/Amaranths- Wheat//Buckwheat/P ea/Cole Crop/ Cabbage/ Barley/Potato	Fallow- Wheat//Buckwheat/Pea/Cole Crop/ Barley/Potato	Use of short duration , Rainfed varieties,mulching ,tillage and weed control	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building

*Matrix for specifying condition of early season drought due to delayed onset of monsoon (2, 4, 6, & 8 weeks) compared to normal onset (2.1.1)

	Delay in onset of monsoon by			
	2 wks	4 wks	6 wks	8 wks
June 1 st wk	June 3 rd wk	July 1 st wk	July 3 rd wk	Aug 1 st wk
June 2 nd wk	June 4 th wk	July 2 nd wk	July 4 th wk	Aug 2 nd wk
June 3 rd wk	July 1 st wk	July 3 rd wk	Aug 1 st wk	Aug 3 rd wk
June 4 th wk	July 2 nd wk	July 4 th wk	Aug 2 nd wk	Aug 4 th wk
July 1 st wk	July 3 rd wk	Aug 1 st wk	Aug 3 rd wk	Sep 1 st wk
July 2 nd wk	July 4 th wk	Aug 2 nd wk	Aug 4 th wk	Sep 2 nd wk

Early season drought (Normal onset)	Major Farming situation ^a	Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Normal onset followed by	(1) Tropical climate with	Irrigated/Paddy /Finger	Use of late sowing varieties , re-sowing , select short	Hoeing and weeding, organic mulching	Re-sowing late and short duration varieties

15-20 days dry spell after sowing leading to poor germination/ crop stand etc.	moderately high temperature (18-30 ⁰ C), medium rainfall, low humidity, Irrigated Valley/low hill, High rainfall and Alluvial sandy soil,in nature	millet/Barnyard millet/Maize- Wheat/Toria/Wheat+ Toria/Potato/Onion/G arlic/Barley	duration varieties/gap filling and keep lesser spacing between the plant		and use moisture conservation practices.
		Tomato/Brinjal,/Chillies- Wheat/Barley /Toria/Potato/Onion/ Garlic			
	(2) Rainfed valley/Low hill, undulating topography, Moderate rainfall and Silty sandy soil	Rainfed Paddy / Finger millet / Barnyard millet / Maize /Black Gram /Red Gram/Horse Gram/ Frenchbean,- Wheat/Toria/Potato/B arley/ Rai,/Lentil/Buckwheat	Use of late sowing varieties , re-sowing , select short duration varieties/gap filling and keep lesser spacing between the plant	Hoeing and weeding, organic mulching	Re-sowing late and short duration varieties and use moisture conservation practices
		Rainfed Paddy / Finger millet / Barnyard millet / Maize-Fallow- Rainfed Paddy / Finger millet / Barnyard millet / Maize			
		Fallow- Wheat/Toria/Potato/B arley			
	(3) South facing mid hills,low rainfall,dry receiving maimum sunlight, agricultural activities are being taken in terrace fields and this situation is mostly dry due to high duration & intensity of sunlight and silty sandy soil	Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean- Barley/ Lentil & Mustard/ Wheat/Toria/Potato/ Radish	Use of late sowing varieties , re-sowing , select short duration varieties/gap filling and keep lesser spacing between the plant	Hoeing and weeding, organic mulching	Re-sowing late and short duration varieties and use moisture conservation practices
		Horse gram/ Urd/ Arhar+Barnyard			

		Millet			
		Rainfed Horse gram/Urd-Wheat/Barley			
		Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean-Fallow- Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean			
	(4) North facing mid hills, moderate rainfall, agricultural activities are being taken in terrace fields and this situation is comparatively cool & moist due to less intensity of sunlight and more number of perennial springs and silty sandy soil	Irrigated Paddy /Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/ Arhar) /Barnyard millet, (Gahat/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato - Wheat/Toria/Potato/Barley/Mustard/Radish	Use of late sowing varieties , re-sowing , select short duration varieties/gap filling and keep lesser spacing between the plant	Hoeing and weeding, organic mulching	Re-sowing late and short duration varieties and use moisture conservation practices
		Rainfed Horse gram/Urd/Soybean-Wheat/Barley			
		Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato – Fallow- Rainfed Paddy/Finger millet/Finger millet+(

		Horse gram, Urd, Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato			
		Fallow- Wheat/Toria/Potato/Barley/Mustard/Radish			
	(5) High hills, high rainfall, agricultural activities are being taken in terrace fields and clay loam	Rainfed Paddy/Finger millet/Sanwa/ Tomato /Amaranths/ Rajma -Barley / Potato / Wheat/ Rapeseed/ Cabbage/ Potato/Pea/ Radish.	Use of late sowing varieties , re-sowing , select short duration varieties/gap filling and keep lesser spacing between the plant	Hoeing and weeding, organic mulching	Re-sowing late and short duration varieties and use moisture conservation practices
	(6) Very high hills, very high rainfall, climate is of humid temperate type with low to very low annual mean temperature. The snowfall is high., mountainous topography and clay loam soil	Rainfed Paddy/ Arbi /Finger millet/Barnyard millet/Amaranths- Wheat//Buckwheat/Pea/Cole Crop/ Cabbage/ Barley/Potato	Use of late sowing varieties , re-sowing , select short duration varieties/gap filling and keep lesser spacing between the plant	Hoeing and weeding, organic mulching	Re-sowing late and short duration varieties and use moisture conservation practices

Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation ^a	Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
At vegetative stage	(1) Tropical climate with moderately high temperature (18-30 ⁰)	Irrigated/Paddy /Finger millet/Barnyard millet/Maize-	Mid season correction (thinning with in the row and between the row (remove every third row),	Hoeing and weeding, organic mulching, windbreak and shelterbelts	a) Link SAU, NSC, department of agriculture for getting good quality seed.

	C), medium rainfall, low humidity, Irrigated Valley/low hill, High rainfall and Alluvial sandy soil, in nature	Wheat/Toria/Wheat+ Toria/Potato/Onion/Garlic/Barley Tomato/Brinjal,/Chillies- Wheat/Barley /Toria/Potato/Onion/ Garlic	praying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favorable conditions, ratooning of drought affected crops if subsequent rain is possible and use of anti-transpirant		b) Link RKY for getting hill based farm machineries. c) Capacity building
	(2) Rainfed valley/Low hill, undulating topography, Moderate rainfall and Silty sandy soil	Rainfed Paddy / Finger millet / Barnyard millet / Maize /Black Gram /Red Gram/Horse Gram/ Frenchbean,- Wheat/Toria/Potato/Barley/ Rai,/Lentil/Buckwheat Rainfed Paddy / Finger millet / Barnyard millet / Maize-Fallow-Rainfed Paddy / Finger millet / Barnyard millet / Maize Fallow- Wheat/Toria/Potato/Barley	Mid season correction (thinning with in the row and between the row (remove every third row), praying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favorable conditions, ratooning of drought affected crops if subsequent rain is possible and use of antitranspirant	Hoeing and weeding, organic mulching, windbreak and shelterbelts	
	(3) South facing mid hills, low rainfall, dry receiving maximum sunlight, agricultural activities are being taken in terrace fields and this situation is mostly dry due to high duration & intensity of sunlight and silty sandy soil	Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean- Barley/ Lentil & Mustard/ Wheat/Toria/Potato/ Radish Horse gram/ Urd/ Arhar+ Barnyard	Mid season correction (thinning with in the row and between the row (remove every third row), praying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favorable conditions, ratooning of drought affected crops if subsequent rain is possible and use of	Hoeing and weeding, organic mulching, windbreak and shelterbelts	

		Millet	antitranspirant	
		Rainfed Horse gram/Urd-Wheat/Barley		
		Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean-Fallow- Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean		
	(4) North facing mid hills, moderate rainfall, agricultural activities are being taken in terrace fields and this situation is comparatively cool & moist due to less intensity of sunlight and more number of perennial springs and silty sandy soil	Irrigated Paddy /Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/ Arhar) /Barnyard millet+ (Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato - Wheat/Toria/Potato/Barley/Mustard/Radish	Mid season correction (thinning with in the row and between the row (remove every third row), praying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favorable conditions, ratooning of drought affected crops if subsequent rain is possible and use of antitranspirant	Hoeing and weeding, organic mulching, windbreak and shelterbelts
		Rainfed Horse gram/Urd/Soyabean-Wheat/Barley		
		Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/Arhar) /Barnyard millet+ Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato – Fallow- Rainfed Paddy/Finger millet/Finger millet+(

		Horse gram, Urd, Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato			
		Fallow- Wheat/Toria/Potato/Barley/Mustard/Radish			
	(5) High hills, high rainfall, agricultural activities are being taken in terrace fields and clay loam	Rainfed Paddy/Finger millet/Sanwa/ Tomato /Amaranths/ Rajma - Barley / Potato / Wheat/ Rapeseed/ Cabbage/ Potato/Pea/ Radish.	Mid season correction (thinning with in the row and between the row (remove every third row), praying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favorable conditions, ratooning of drought affected crops if subsequent rain is possible and use of antitranspirant	Hoeing and weeding, organic mulching, windbreak and shelterbelts	
	(6) Very high hills, very high rainfall, climate is of humid temperate type with low to very low annual mean temperature. The snowfall is high., mountainous topography and clay loam soil	Rainfed Paddy/ Arbi /Finger millet/Barnyard millet/Amaranths- Wheat//Buckwheat/Pea/Cole Crop/ Cabbage/ Barley/Potato	Mid season correction (thinning with in the row and between the row (remove every third row), praying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favorable conditions, ratooning of drought affected crops if subsequent rain is possible and use of antitranspirant	Hoeing and weeding, organic mulching, windbreak and shelterbelts	
Condition					
Mid season drought (long dry spell)		Crop/cropping system^b	Crop management^c	Soil nutrient & moisture conservation measures^d	Remarks on Implementation^e
At	(1)	Irrigated/Paddy	Remove 3-4 basal leaves of the crop in	Hoeing and	a) Link SAU, NSC,

reproductive stage	Tropical climate with moderately high temperature (18-30 ⁰ C), medium rainfall, low humidity,Irrigated Valley/low hill, High rainfall and Alluvial sandy soil,in nature	/Finger millet/Barnyard millet/Maize- Wheat/Toria/Wheat+ Toria/Potato/Onion/G arlic/Barley	case of early stoppage of rain,), spraying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favourable conditions	weeding, organic mulching, use of windbreak and shelterbelts, water harvesting and its recycling for supplemental irrigation to save the crop,	department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries. c) Capacity building
		Tomato/Brinjal,/Chillies- Wheat/Barley /Toria/Potato/Onion/ Garlic			
	(2) Rainfed valley/Low hill, undulating topography,Moderate rainfall and Silty sandy soil	Rainfed Paddy / Finger millet / Barnyard millet / Maize /Black Gram /Red Gram/Horse Gram/ Frenchbean,- Wheat/Toria/Potato/B arley/ Rai,/Lentil/Buckwheat	Remove 3-4 basal leaves of the crop in case of early stoppage of rain,), spraying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favourable conditions	Hoeing and weeding, organic mulching, use of windbreak and shelterbelts, water harvesting and its recycling for supplemental irrigation to save the crop,	
		Rainfed Paddy / Finger millet / Barnyard millet / Maize-Fallow-Rainfed Paddy / Finger millet / Barnyard millet / Maize			
		Fallow- Wheat/Toria/Potato/B arley			
	(3) South facing mid hills,low rainfall,dry receiving maimum sunlight, agricultural activities are being taken in terrace fields and this situation is mostly dry due to high duration & intensity of sunlight and silty	Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean- Barley/ Lentil & Mustard/ Wheat/Toria/Potato/ Radish	Remove 3-4 basal leaves of the crop in case of early stoppage of rain,), spraying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favourable conditions	Hoeing and weeding, organic mulching, use of windbreak and shelterbelts, water harvesting and its recycling for supplemental irrigation to save the crop,	
		Horse gram/ Urd/			

	sandy soil	Arhar+Barnyard Millet		
		Rainfed Horse gram/Urd-Wheat/Barley		
		Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean-Fallow- Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean		
	(4) North facing mid hills, moderate rainfall, agricultural activities are being taken in terrace fields and this situation is comparatively cool & moist due to less intensity of sunlight and more number of perennial springs and silty sandy soil	Irrigated Paddy /Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/ Arhar) /Barnyard millet, (Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato - Wheat/Toria/Potato/Barley/Mustard/Radish	Remove 3-4 basal leaves of the crop in case of early stoppage of rain,), spraying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favourable conditions	Hoeing and weeding, organic mulching, use of windbreak and shelterbelts, water harvesting and its recycling for supplemental irrigation to save the crop,
		Rainfed Horse gram/Urd/Soyabean-Wheat/Barley		
		Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato – Fallow- Rainfed Paddy/Finger millet/Finger millet+(

		Horse gram, Urd, Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato			
		Fallow- Wheat/Toria/Potato/Barley/Mustard/Radish			
	(5) High hills, high rainfall, agricultural activities are being taken in terrace fields and clay loam	Rainfed Paddy/Finger millet/Sanwa/ Tomato /Amaranths/ Rajma - Barley / Potato / Wheat/ Rapeseed/ Cabbage/ Potato/Pea/ Radish.	Remove 3-4 basal leaves of the crop in case of early stoppage of rain,), spraying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favourable conditions	Hoeing and weeding, organic mulching, use of windbreak and shelterbelts, water harvesting and its recycling for supplemental irrigation to save the crop,	
	(6) Very high hills, very high rainfall, climate is of humid temperate type with low to very low annual mean temperature. The snowfall is high., mountainous topography and clay loam soil	Rainfed Paddy/ Arbi /Finger millet/Barnyard millet/Amaranths- Wheat//Buckwheat/Pea/Cole Crop/ Cabbage/ Barley/Potato	Remove 3-4 basal leaves of the crop in case of early stoppage of rain,), spraying of 2% urea and recommended concentration of other plant nutrient to take the advantage of favourable conditions	Hoeing and weeding, organic mulching, use of windbreak and shelterbelts, water harvesting and its recycling for supplemental irrigation to save the crop,	

Terminal drought	Major Farming situation^a	Crop/cropping system^b	Crop management^c	Rabi Crop planning^d	Remarks on Implementation^e
	(1) Tropical climate with moderately high temperature (18-30 ⁰ C), medium rainfall, low humidity,Irrigated Valley/low hill, High	Irrigated/Paddy /Finger millet/Barnyard millet/Maize- Wheat/Toria/Wheat+Toria/Potato/Onion/Garlic/Barley	Remove 3-4 basal leaves of the crop in case of early stoppage of rain, harvesting at physiological maturity stage if there is moisture stress at very late stage	Early sowing and use of short duration and drought resistant varieties, mixed cropping (barley+torial)	a) Link SAU, NSC, department of agriculture for getting good quality seed. b) Link RKY for getting hill based farm machineries.

	rainfall and Alluvial sandy soil, in nature	Tomato/Brinjal,/Chillies- Wheat/Barley /Torja/Potato/Onion/Garlic		and use of high seed rate	c) Capacity building
(2)	Rainfed valley/Low hill, undulating topography, Moderate rainfall and Silty sandy soil	Rainfed Paddy / Finger millet / Barnyard millet / Maize /Black Gram /Red Gram/Horse Gram/ Frenchbean,- Wheat/Torja/Potato/Barley/ Rai,/Lentil/Buckwheat	Remove 3-4 basal leaves of the crop in case of early stoppage of rain, harvesting at physiological maturity stage if there is moisture stress at very late stage	Early sowing and use of short duration and drought resistant varieties, mixed cropping (barley+torial) and use of high seed rate	
		Rainfed Paddy / Finger millet / Barnyard millet / Maize-Fallow-Rainfed Paddy / Finger millet / Barnyard millet / Maize			
		Fallow- Wheat/Torja/Potato/Barley			
(3)	South facing mid hills, low rainfall, dry receiving maximum sunlight, agricultural activities are being taken in terrace fields and this situation is mostly dry due to high duration & intensity of sunlight and silty sandy soil	Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean- Barley/ Lentil & Mustard/ Wheat/Torja/Potato/ Radish	Remove 3-4 basal leaves of the crop in case of early stoppage of rain, harvesting at physiological maturity stage if there is moisture stress at very late stage	Early sowing and use of short duration and drought resistant varieties, mixed cropping (barley+torial) and use of high seed rate	
		Horse gram/ Urd/ Arhar+Barnyard Millet			
		Rainfed Horse gram/Urd- Wheat/Barley			

		Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean- Fallow- Finger Millet/ Barnyard Millet/ Maize/ Tomato Amaranths/ Sesamum/ Soybean			
	(4) North facing mid hills, moderate rainfall, agricultural activities are being taken in terrace fields and this situation is comparatively cool & moist due to less intensity of sunlight and more number of perennial springs and silty sandy soil	Irrigated Paddy /Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/ Arhar) /Barnyard millet, (Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato - Wheat/Toria/Potato/B arley/Mustard/Radish Rainfed Horse gram/Urd/Soyabean- Wheat/Barley Rainfed Paddy/Finger millet/Finger millet+(Horse gram/ Urd/Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato – Fallow- Rainfed Paddy/Finger millet/Finger millet+(Horse gram, Urd, Arhar) /Barnyard millet, Horse gram/Urd/Arhar) /Maize/ Amaranths/ Sesamum/Tomato	Remove 3-4 basal leaves of the crop in case of early stoppage of rain, harvesting at physiological maturity stage if there is moisture stress at very late stage	Early sowing and use of short duration and drought resistant varieties, mixed cropping (barley+torial) and use of high seed rate	

		Fallow- Wheat/Toria/Potato/B arley/Mustard/Radish			
	(5) High hills, high rainfall, agricultural activities are being taken in terrace fields and clay loam	Rainfed Paddy/Finger millet/Sanwa/ Tomato /Amaranths/ Rajma - Barley / Potato / Wheat/ Rapeseed/ Cabbage/ Potato/Pea/ Radish.	Remove 3-4 basal leaves of the crop in case of early stoppage of rain, harvesting at physiological maturity stage if there is moisture stress at very late stage	Early sowing and use of short duration and drought resistant varieties, mixed cropping (barley+torial) and use of high seed rate	
	(6) Very high hills, very high rainfall, climate is of humid temperate type with low to very low annual mean temperature. The snowfall is high., mountainous topography and clay loam soil	Rainfed Paddy/ Arbi /Finger millet/Barnyard millet/Amaranths- Wheat//Buckwheat/Pe a/Cole Crop/ Cabbage/ Barley/Potato	Remove 3-4 basal leaves of the crop in case of early stoppage of rain, harvesting at physiological maturity stage if there is moisture stress at very late stage	Early sowing and use of short duration and drought resistant varieties, mixed cropping (barley+torial) and use of high seed rate	

Notes:

- a: Describe the major farming situation such as shallow red soils, deep black soils, uplands, medium lands, eroded hill slopes etc. tank fed black soils, shallow acid soils, sodic vertisols etc.
- b: Describe the normal crop or cropping system grown in that farming situation including catch crop, sequence, rotation & variety if known.
- c: Describe the alternative crop or variety or cropping pattern in view of the delay in monsoon and shortening of the growing period including delay in sowing of nurseries in case of paddy.
- In case of normal onset followed by early season droughts re-sowing may be recommended including variety seed rate etc.
 - In case of early or mid season dry spells indicate crop management techniques to save standing crop.
 - In case of terminal drought indicate giving life saving supplemental irrigation, if available or taking up harvest at physiological maturity with some realizable grain/fodder yield etc.
- d: Describe all agronomic practices which help in coping with late planting like increased or decreased spacing, changes in planting geometry, intercropping in case of sole crops, thinning, mulching, spray of anti-transpirants or other chemicals, supplemental irrigation, soil and moisture conservation practices like ridging, conservation furrows, dust mulch etc.
- In case of early and mid season dry spells indicate moisture conservation techniques to save standing crop.
 - In case of terminal drought indicate early rabi cropping with suitable crops/varieties with a possibility of giving pre-sowing/come up irrigation etc.

e: Give details on the source of the breeder seed, in case an alternate crop or variety is suggested as part of the contingency. For agronomic measures, indicate any convergence possible with ongoing central or state schemes like National Rural Employment Guarantee Scheme (NREGS), Integrated Watershed Management Programme (IWMP), Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Integrated Scheme on Oilseeds, Pulses, Oilpalm and Maize (ISOPOM), National Horticulture Mission (NHM), Community Land Development Programme (CLDP)etc., to meet the cost of materials, labour or implements etc. to carry out any field based activity quickly.

2.1.2 Irrigated situation: Not applicable

Delayed/limited release of water in canals due to low rainfall	Major Farming situation^f	Crop/cropping system^g	Change in crop/cropping system^h	Agronomic measuresⁱ	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Major Farming situation^f	Crop/cropping system^g	Change in crop/cropping system^h	Agronomic measuresⁱ	Remarks on Implementation
Lack of inflows into tanks due to insufficient/delayed onset of monsoon	Major Farming situation^f	Crop/cropping system^g	Change in crop/cropping system^h	Agronomic measuresⁱ	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Major Farming situation^f	Crop/cropping system^g	Change in crop/cropping system^h	Agronomic measuresⁱ	Remarks on Implementation^j

^f Describe such as uplands, medium and low lands and source of irrigation such as tank fed medium or deep black/alluvial/red soils, tube well irrigated alluvial soils, canal irrigated red soils, well irrigated black soils etc.,

^g The normal crop or cropping systems grown in a given irrigated situation

^h Suggested change in the crop, variety or cropping system in view of delay in release of irrigation water, less water availability etc.

ⁱ All agronomic measures like improved methods of irrigation (skip row etc.), micro irrigation (drip/sprinkler/sub-surface), deficit irrigation, limited area irrigation, mulching etc, that improve water use efficiency and make best use of limited water including methods of ground water recharge and sharing.

^j Comments on source of availability of seed of the alternate crop or variety, any constraints in marketing of alternative crop implications for livestock and dairy sectors and details of state or central schemes like National Rural Employment Guarantee Scheme (NREGS), Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Integrated Scheme on Oilseeds, Pulses, Oilpalm and Maize (ISOPOM), National Horticulture Mission (NHM), etc., which facilitate implementation of the agronomic measures suggested.

2.2 Unusual rains (untimely, un seasonal etc) (for both rainfed and irrigated situations)

Continuous high rainfall in a short span leading to water logging: Not applicable	Vegetative stage^k	Flowering stage^l	Crop maturity stage^m	Post harvestⁿ
Wheat	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition.	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition	Use wind break and shelter belts and sowing of crop parallel to the wind direction, Early sowing, use of short stature and short duration varieties and harvest the crop at physiological maturity stage in situation of weather vagaries in irrigated condition	Dry the grains and bring down the moisture content to desired level (13-14%).
Rice	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition and Use of short stature varieties	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition	Use wind break and shelter belts and sowing of crop parallel to the wind direction, Early sowing, use of short stature and short duration varieties and harvest the crop at physiological maturity stage in situation weather vagaries.	After harvesting the crop store the same in the covered area. And bring down the moisture content to the desired level
Finger millet	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition	Use wind break and shelter belts and sowing of crop parallel to the wind direction, Early sowing, use of short stature and short duration varieties and harvest the crop at physiological maturity stage in situation of weather vagaries.	After harvesting the crop store the same in the covered area. And bring down the moisture content to the desired level

Barn yard millet	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition	Use wind break and shelter belts and sowing of crop parallel to the wind direction, Early sowing, use of short stature and short duration varieties and harvest the crop at physiological maturity stage in situation of weather vagaries.	After harvesting the crop store the same in the covered area. And bring down the moisture content to the desired level
Maize	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition	Use wind break and shelter belts and sowing of crop parallel to the wind direction, minimum use of nitrogenous fertilizers and use of phosphatic fertilizers and avoid irrigation to the fields in situation of weather vagaries in irrigated condition	Use wind break and shelter belts and sowing of crop parallel to the wind direction, Early sowing, use of short stature and short duration varieties and harvest the crop at physiological maturity stage in situation of weather vagaries.	After harvesting the crop store the same in the covered area. And bring down the moisture content to the desired level
Horticulture				
Crop1 (specify)				
Outbreak of pests and diseases due to un seasonal rains				
Horticulture				

2.3 Floods

Transient water logging/ partial inundation¹	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest

2.4 Extreme events : Heat wave/ Cold wave/ Frost/ Hailstorm/ Cyclone

	Seedling/ nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat wave				
Upland rice	-	Use of wind breaks, life saving irrigation		
Transplanted rice	Light irrigation	Irrigation, mulching		
Finger millet	-	Irrigation, mulching		
Horticulture				
Fruit crop	Irrigation in the	Irrigation and mulching in tree basin	Irrigation and mulching in	

	evening hours		tree basin	
Veg crop (Tomato, Capsicum, Cauliflower etc.)		Life saving irrigation in evening hours		
Cold wave				
Wheat		Use of wind breaks, light irrigation		
Oil seed		Use of wind breaks, light irrigation		
Pulse		Use of wind breaks, light irrigation		
Frost				
Wheat		Light irrigation, spray of 2@ urea, burning around the field		
Oilseed		Light irrigation, spray of 2@ urea, burning around the field		
Pulse		Light irrigation, spray of 2@ urea, burning around the field		
Veg pea		Light irrigation and spray of karathane 1 ml/ltr water in January		
Potato		Light irrigation and two spray of Indofill M-45		
Mango		Fumigation by burning of waste material near orchard during Jan. in evening hour and spray of COC 2g/ltr water in Feb.		
Hailstorm				
Apple			Cover the tree with halenet	
Pear			Cover the tree with halenet	
Peach			Cover the tree with halenet	
Plum			Cover the tree with halenet	

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Before the event ^s	During the event	After the event
Drought			
Feed and fodder availability	Increasing area under fodder production; Collect crop residues, and tree fodder to store at safe place, use mangers, use chaff cutters , hay storage.	Utilization of fodder from Perennial & reserve sources, Open grazing in forests and alpine slopes/ community lands. and feeding of crop residues; use of mangers and chaff cutters , feeding of household waste, Prepare the silage of non-leguminous fodder crops for the scarcity period.	Availing Insurance, culling undesirable Livestock; Raising of fodder trees, replacement of unproductive animals with improved ones

Drinking water	Storage of water in tanks , Traditional water ponds , rivers	Utilization of stored water, Stall drinking , rivers , traditional water ponds	Rejuvenation of water sources
Health and disease management	Advance preparation with medicines and vaccination, local ethno pharmaceutical and alternate medicines, keeping of disease resistance varieties.	Treatment of affected livestock by mass campaign, Modern veterinary care , veterinary camps , insulation, create smoke during nights in the cattle sheds to protect animals from mosquito and fleabites	Proper veterinary care , awareness , capacity building of locals, health care management
Floods			
Feed and fodder availability			
Drinking water			
Health and disease management			
Cyclone			
Feed and fodder availability			
Drinking water			
Health and disease management			
Cold wave			
Shelter/environment management	Brought back from high hill pasture lands to nearby pastures; restricted open grazing,	Stationary conditions in cowsheds , group living, dry grass flooring, gunny bags on windows, gunny bags wrapped on the belly of milking animals , restricted open grazing during sunny days only, adequate shelter. Prevent water-logging conditions in animal houses. In <i>Kachha</i> houses, the floor should be elevated with bricks, Feed straw & other fodder to milch animals with concentrates and protect the young ones from cold.	Open grazing, grazing in open sun , massage of milking animals and other species, hot water bath of animals
Health and disease management	Traditional herbs fed to animals	Warm living conditions, syrup of lassi (curd juice) after roasting fed to animals, avoid exposure to cold and rains/ snow. The prophylactic and preventive measures for the control of diseases should be adopted on the advice of veterinarian. For control of liver flukes, do the deworming of animals.	Open grazing in sunny days and feeding of medicinal herbs. In case of acute problem , veterinary care

2.5.2 Poultry

	Before the event ^a	During the event	After the event	
Drought				
Shortage of feed ingredients	Surplus storage of poultry feed ; No special preparations these are kept as backyard activity	Utilization of surplus feed; No impact as these is kept in captivity. Moreover these are kept as backyard and household waste is sufficient for their keeping	Kept as backyard activity Availing Insurance Culling affected birds	Feed can be supplied through fair price shops , cooperatives and the SHGs/ VOs
Drinking water	Storage of water in tanks	Utilize stored water	Kept as backyard activity	Water storage structures can be constructed in collaboration with MNERAGA
Health and disease management	Advance preparation with medicines and vaccination	Mass Vaccination, Locally managed with the help of veterinary care	Kept as backyard activity and local health care is practiced	Collaboration with rural development programmes
Heat wave and cold wave				
Shelter/environment management	Proper Ventilation	Proper aeration and fan , open spacing, water supply , gunny bags on windows during cold wave, proper warming .supply of hot water during cold waves.	Kept as backyard activity	
Health and disease management	Local	Local and Veterinary care	Kept as backyard activity	

2.5.3 Fisheries/ Aquaculture

	Before the event ^a	During the event	After the event
1) Drought			
(i) Shallow water depth due to insufficient rains/inflow	<ul style="list-style-type: none"> Water harvesting structures with rain water impounding from catchment areas Keep a deeper portion as a refuge 	<ul style="list-style-type: none"> Up to 50% of pond surface area may be covered with floating algae like azolla to reduce evaporation. Water to supplement at least 20% of the 	Water harvesting structures with rain water impounding from catchment areas; watershed development

	pond/ depression/trench preferably at lowside of pond	impoundment of pond to safeguard the stocked fish biomass may be arranged if available. •Partial or complete fish harvesting may be done in extreme events to reduce the density.	planning and implementations with focus on renovation and desilting of pond.
2) Heat wave and cold wave			
Management of pond environment	Keep a deeper portion as a refugee pond / depression preferably at lower side of pond		
Health and disease management	Rapid mobile veterinary team (RMVT) may be formed		