

**State: NAGALAND**

**Agriculture Contingency Plan for District: WOKHA**

<b>1.0 District Agriculture profile</b>				
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>			
	Agro Ecological Sub Region (ICAR)	Assam And Bengal Plain, Hot Subhumid To Humid (Inclusion Of Perhumid) Eco-Region (15.4)		
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region (II)		
	Agro Climatic Zone (NARP)	Sub-Tropical Hill Zone (NEH-3)		
	List all the districts or part thereof falling under the NARP Zone	Wokha, Mokokchung, Kohima.		
	Geographic coordinates of district headquarters	<b>Latitude</b>	<b>Longitude</b>	<b>Altitude</b>
		26 <sup>0</sup> 05'39.28" N	94 <sup>0</sup> 15'37.25" E	1551 M
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	-		
Mention the KVK located in the district	KVK , Wokha, Post Box No. 137. Distt. Wokha – 797111 Nagaland			

<b>1.2</b>	<b>Rainfall</b>	<b>Normal RF(mm)</b>	<b>Normal Rainy days (number)</b>	<b>Normal Onset</b>	<b>Normal Cessation</b>
	SW monsoon (June-Sep):	1541.4	99	1 <sup>st</sup> Week of June	2 <sup>nd</sup> week of October
	NE Monsoon(Oct-Dec):	108.8	15	3rd week of October	2 <sup>nd</sup> Week of November
	Winter (Jan- March)	35.6	7		
	Summer (Apr-May)	347.2	27		
	Annual	2033	148		

<b>1.3</b>	<b>Land use pattern of the district</b> (latest statistics)	Geographical area ('000 ha)	Cultivable area ('000 ha)	Forest area ('000 ha)	Land under non-agricultural use ('000 ha)	Permanent Pastures ('000 ha)	Cultivable wasteland ('000 ha)	Land under Misc. tree crops and groves ('000 ha)	Barren and uncultivable land ('000 ha)	Current Fallows ('000 ha)	Other fallows ('000 ha)
	Area ('000 ha)	158.2	40.4	74.4	7.1	-	4.1	8.5	0.3	12.5	10.6

<b>1.4</b>	<b>Major Soils (common names like red sandy loam deep soils (etc.,))</b>	<b>Area ('000 ha)</b>	<b>Percent (%) of total</b>
	New alluvial soils		69
	Old alluvial soils		9
	Red Brown loamy soils		8
	Lateritic soils		14

Data source : District Soil and Water Conservation Officer, Wokha, Nagaland).

<b>1.5</b>	<b>Agricultural land use</b>	<b>Area ('000 ha)</b>	<b>Cropping intensity %</b>
	Net sown area	31.7	130
	Area sown more than once	8.7	
	Gross cropped area	40.4	

<b>1.6</b>	<b>Irrigation</b>	<b>Area ('000 ha)</b>		
	Net irrigated area	0.1		
	Gross irrigated area	0.1		
	Rainfed area= Net sown-Net irrigated	26.4		
	<b>Sources of Irrigation</b>	<b>Number</b>	<b>Area ('000 ha)</b>	<b>% of total irrigated area</b>
	Canals		-	-
	Tanks	-	-	-
	Open wells	-	-	-
	Bore wells	-	-	-
	Lift irrigation schemes	-	-	-
	Micro-irrigation		-	-
	River Channels/Streams	-	5.355	16.89
	Total Irrigated Area		5.355	16.89
	Pump sets	-		
	No. of Tractors	4		
	<b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b>	<b>No. of blocks/ Tehsils</b>	<b>(%) area</b>	<b>Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)</b>
	Over exploited	-	-	-
	Critical	-	-	-
	Semi- critical	-	-	-
	Safe	-	-	-
Wastewater availability and use	-			
Ground water quality				

Source: SREP ATMA.

1.7 Area under major field crops & horticulture (as per latest figures) year 2008 – 09.

	Major field crops cultivated	Area ('000 ha)						Grand total
		Kharif			Rabi			
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	
	Paddy		18.6	18.6	-	-	-	18.6
	Maize		0.5	0.5	-	-	-	0.5
	Oilseeds (Groundnut, soyabean, sesamum, mustard.)		0.5	0.5	-	0.3	0.3	0.5
	Pulses (Ricebean, beans, Kholar, pea)		0.3	0.3	-	0.1	0.1	0.3
	Potato		0.1	0.1	-	-	-	0.1
	<b>Horticulture crops - Fruits</b>	<b>Total ('000' ha)</b>						
	Passion Fruit	0.2						
	Orange	0.2						
	Banana	0.5						
	Pineapple	0.1						

Source: SREP ATMA, KVK vision 2020, DHO Office & DAO Office Wokha.

	Horticulture crops - Vegetables	Total area ('000 ha)
1	Brinjal	0.05
2	Beans	
3	Colocasia	
4	Pea	
5	Chilly	
	<b>Medicinal and Aromatic crops</b>	<b>Total area ('000 ha)</b>
1	Centella	0.02
2	Lemon Grass	
3	Citronella	
4	<i>Centella asiatica</i>	
	Plantation crops	Total area ('000 ha)
1	Arecanut	0.01
2	Tea	0.01
	Fodder crops	Total area ('000 ha)
1	Napier (Hybrid)	0.02
	<b>Grazing land</b>	0.1
	<b>Sericulture etc</b>	0.1

<b>1.8</b>	<b>Livestock (in number) for 2007</b>	<b>Male ('000)</b>	<b>Female ('000)</b>	<b>Total ('000)</b>			
	Non descriptive Cattle (local low yielding)	7.75	36.56	44.326			
	Crossbred cattle	4.30	14.59	18.897			
	Non descriptive Buffaloes (local low yielding)	0.44	0.905	1.348			
	Rabbit	3.01	3.763	6.780			
	Goat	15.00	15.87	30.884			
	Sheep (indigenous)	0.09	0.114	.210			
	Others Pig (exotic/ Crossbreed)	21.13	27.26	48.395			
	Pig (indigenous)	19.62	56.87	76.494			
	Dog	14.83	6.78	21.614			
	Horse + Pony	0.031	.018	.049			
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>				
	Commercial	01	6.2				
	Backyard	-	33.3				
<b>1.10</b>	<b>A. Capture (Data source: District Fishery Officer, Wokha)</b>						
	<b>i) Marine (Data Source: Fisheries Department)</b>	<b>No. of fishermen</b>	<b>Boats</b>		<b>Nets</b>		<b>Storage facilities (Ice plants etc.)</b>
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		-	-	-	-	-	-
	<b>ii) Inland (Data Source: Fisheries Department, Wokha)</b>	<b>No. Farmer owned ponds</b>		<b>No. of Reservoirs</b>		<b>No. of village tanks</b>	
		1751		01		120	
<b>B. Culture</b>							
		<b>Water Spread Area (ha)</b>		<b>Yield (t/ha)</b>		<b>Production ('000 tons)</b>	
	<b>i) Brackish water (Data Source: MPEDA/ Fisheries Department)</b>	-		-		- 5	
	<b>ii) Fresh water (Data Source: Fisheries Department)</b>	2.5		1.8		0.5	

### 1.11 Production and Productivity of major crops

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
<b>Major Field crops (Crops to be identified based on total acreage)</b>										
	Paddy	35.7	2100	-	-	-	-	35.7	2100	-
	Pulses	0.5	1200	.0891	1100	-	-	0.5	1200	-
	Maize	1.0	1800	-	-	-	-	1.0	1800	-
	Oilseeds	0.3	773	.230	700	-	-	0.3	736	-
	Potato	0.3	7500	-	-	-	-	0.3	7500	-
<b>Major Horticultural crops (Crops to be identified based on total acreage)</b>										
	Orange	266.8	4922	-	-	-	-	266.8	4922	-
	Passion fruit	140.9	3849	-	-	-	-	140.9	3849	-
	Banana	183.3	1382.3	-	-	-	-	183.3	1382.3	-
	Pineapple	215	1982.6	-	-	-	-	215	1982.6	-
	Vegetables	150	-	-	-	-	-	-	-	-

Source : SREP ATMA, DAO Office Wokha & DHO Office Wokha.

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Paddy	Pulses	Maize	Oilseeds	Potato
	Kharif- Rainfed	March – April	March - June	March - April	March - April	February
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	-	September - October	-	September - October	-
	Rabi-Irrigated	-	-	-	-	-

Source: DHO office, DVO Office & DAO office.

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought		√	
	Flood		√	
	Cyclone			√
	Hail storm		√	
	Heat wave			√
	Cold wave		√	
	Frost			√
	Sea water intrusion			√
	Pests and disease outbreak ( <b>Citrus trunk borer</b> , gundhi bug, aphids)		√	

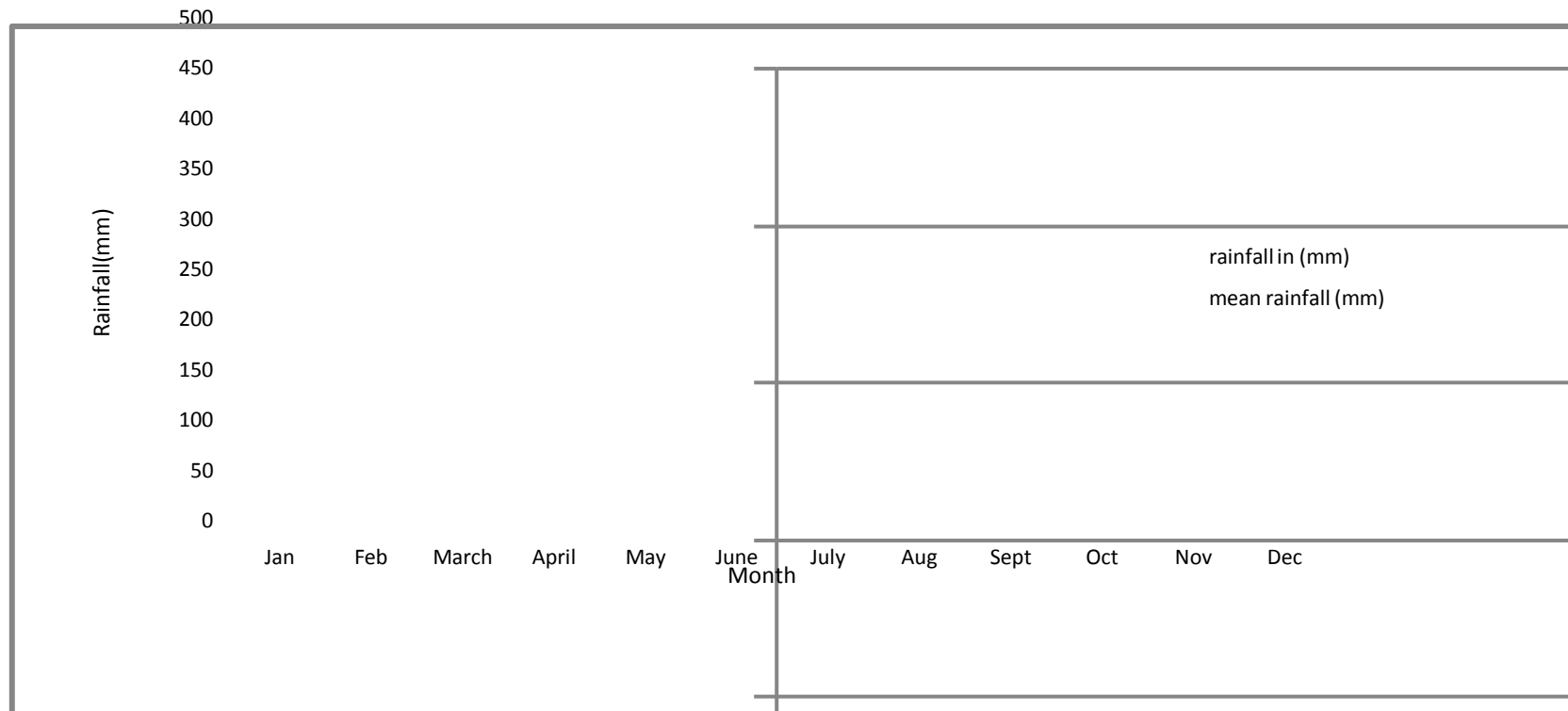
1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

**Annexure – 1: LOCATION MAP OF WOKHA DISTRICT IN NAGALAND**

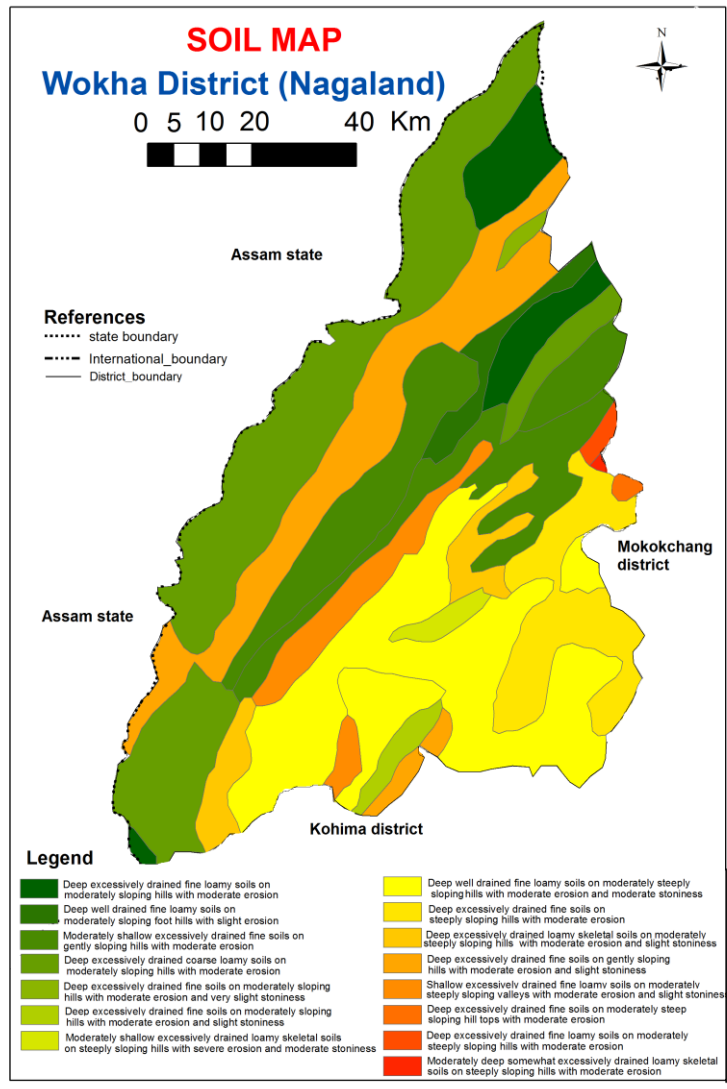




**Annexure – 2: MEAN ANNUAL RAINFALL OF WOKHA DISTRICT**



Average Rainfall map of the district (Source: DSCO Office Wokha)



## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks June 3 <sup>rd</sup> week	Rainfed	Paddy + Local Maize + Vegetables+ Oilseeds + Colocasia	No change in the cropping system/crop and continued	Adopt wider spacing for Maize.	Supply of seeds, cono weeder and low cost water harvesting structures( <i>Jalkund</i> ) for irrigation RKVY, ATMA and other govt programmes
		Potato + Local Maize + Leafy Vegetables		Soil Conservation structures such as contour bunding	
	Chilli + Beans + Ginger	Inter cultural operation and using the weeds as mulch			
	Irrigated	Paddy - <b>Wet Terrace Rice Cultivation (WRC)</b>	-	Proper thinning	
				System of Rice Intensification may be followed with locally available varieties	
				Pre sprouted seeds to be sown for nursery.	
				Wider spacing of 25cmx25cm or 30cmx30cm in case of SRI	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 4 weeks  July 1 <sup>st</sup> week	Rainfed	Paddy + Local Maize + Vegetables + oilseeds + Colocasia (local Varieties)	Paddy: Bhalum-1,2,3&4	Proper soil and water conservation measures adopted  Proper earthing up and mulching done in case of potato and vegetables for moisture conservation	Technical assistance from KVK is required for undertaking these activities and input supply from RKVY and ATMA
		Potato + Local Maize + Leafy Vegetables	Maize: HQPM		
Chilly + Beans + Ginger		French bean: Tuensang Local  Groundnut:ICGS-76 and TAG-24			
	Irrigated	Paddy -Wet Terrace Rice Cultivation (WRC)	Water management should be done properly	Regular weeding with the cono weeder to reduce competition for moisture and subsequent mulching	Supply of seeds ,cono weeder and low cost water harvesting structures( <i>Jalkund</i> ) for water storage and irrigation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 6 weeks  July 3 <sup>rd</sup> week	Rainfed	Paddy + Local Maize + Vegetables + oilseeds + Colocasia (local Varieties)	Paddy: Bhalum-1,2,3&4	Proper soil and water conservation measures adopted  Proper earthing up mulching done in case of potato and vegetables.	Technical assistance from KVK is required for undertaking these activities and input supply from RKVY and ATMA
		Potato + Local Maize + Leafy Vegetables	SARS series		
Chilly + Beans + Ginger		Maize: HQPM  French bean: Tuensang Local  Groundnut:ICGS-76			
	Irrigated	Paddy -Wet Terrace Rice Cultivation	Prefer short duration varieties	Regular weeding with the cono	Supply of seeds ,cono

		(WRC)	such as Jay Bangla, Disang, Luit etc.  Drought Resistant varieties such as RCM-6 and Gitesh from AAU  Life saving irrigation should be provided	weeder to reduce competition for moisture and <i>in situ</i> mulching	weeder and low cost water harvesting structures for life saving irrigation
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Condition			Suggested Contingency measures		
Early season drought(delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Rabi crop planning	Remarks on Implementation
Delay by 8 weeks  August 1 <sup>st</sup> week	Rainfed	Paddy + Local Maize + Vegetables + oilseeds + Colocasia	French bean: Tuensang Local, RCMFB-1, SARS series  Pea :Arkel and Rachna	Proper soil and water conservation measures be adopted  Pre soaked seeds for sowing	Technical assistance from KVK is required for undertaking this activities, RKVY and UNDP for seeds and input supply  Low cost water harvesting( <i>Jalkund</i> ) structures for life saving irrigation
		Potato + Local Maize + Leafy Vegetables Chilly + Beans + Ginger	Oilseeds : M-27 and TS-38	Proper earthing up and mulching done for moisture conservation	
	Irrigated	Paddy - <b>Wet Terrace Rice Cultivation</b> (WRC)	No change in the cropping system.  Water management should be done properly	Regular weeding with the cono weeder to reduce competition for moisture and <i>in situ</i> mulching for moisture conservation	Supply of seeds, cono weeder and low cost water harvesting structures for irrigation

Condition		Suggested Contingency measures			
Early season drought (Normal onset)	Major Farming situation	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measures</b>	<b>Remarks on Implementation</b>
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Rainfed	Paddy + Local Maize + Vegetables + oilseeds + Colocasia	Thinning and gap filling the existing crop  Re sowing	Deep ploughing during pre-kharif season and sowing through minimum or zero tillage,  Mulching through crop and weed residues, Incorporation of organic and green manure  Planting system should be ridge and furrow with effective mulching in case of ginger	Supply of inter cultural implements through RKVY, ATMA etc.
		Potato + Local Maize + Leafy Vegetables			
		Chilly + Beans + Ginger			
	Irrigated	<b>Paddy -Wet Terrace Rice Cultivation (WRC)</b>	Direct seeded rice, Stake bed rice,	Incorporation of <i>Azolla</i> as bio-fertilizer, Integrated nutrient management	Supply of inputs through RKVY, ATMA etc.

Condition		Suggested Contingency measures			
<b>Mid season drought (long dry spell, consecutive 2 weeks rainless (&gt;2.5 mm) period)</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measures</b>	<b>Remarks on Implementation</b>
<b>At vegetative stage</b>	Rainfed	Paddy + Local Maize + Vegetables + oilseeds + Colocasia	Vegetable crops should be supplied with life saving irrigation at the critical stages	Application of water through drip system(if possible)	Technical assistance to be provided by KVK and inputs
		Potato + Local Maize + Leafy Vegetables			

		Chilly + Beans + Ginger		Mulching should be done to conserve the soil moisture.  For Paddy and Maize, weeding operation should be carried out to reduce moisture competition and in situ	support to be provided by District Agriculture Department and ATMA
	Irrigated	<b>Paddy -Wet Terrace Rice Cultivation (WRC)</b>	Spray urea and K @ 0.03%	Life saving irrigation to be applied at critical stages such as panicle initiation stage and flowering stage	-do-

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell)	Rainfed	Paddy + Local Maize + Vegetables + oilseeds + Colocasia	Vegetable crops should be supplied with life saving irrigation.  Spray urea @ 0.02%, Application of water through drip	For Paddy and Maize, weeding operation should be carried out to reduce moisture competition and in situ mulching should be done to conserve the soil moisture	-do-
		Potato + Local Maize + Leafy Vegetables			
Chilly + Beans + Ginger					
	Irrigated	<b>Paddy -Wet Terrace Rice Cultivation (WRC)</b>	Spray urea and B @ 0.02% and 0.01% respectively	Life saving irrigation to be applied at critical stages such as panicle initiation stage and flowering stage	-do-

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)	Rainfed	Paddy + Local Maize + Vegetables + oilseeds + Colocasia	Vegetable crops should be supplied with life saving irrigation. For Paddy and Maize, weeding operation should be carried out to reduce moisture competition and in situ mulching should be done to conserve the soil moisture	Pea(Arkel), French bean, Mustard and Oilseed( M-27, TS-36)	Construction of water harvesting structures for irrigation. Technical assistance to be provided by KVK and inputs support to be provided by District Agriculture Department and ATMA
		Potato + Local Maize + Leafy Vegetables			
		Chilly + Beans + Ginger			
	Irrigated	Paddy -Wet Terrace Rice Cultivation (WRC)	Life saving irrigation to be applied at critical stages such as panicle initiation stage and flowering stage	Green gram, Pea(Arkel) and Mustard and Oilseed( M-27, TS-36)	-do-

### 2.1.2 Drought - Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall			NA		
Condition					



	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall			NA		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment			NA		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon			NA		
Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall			NA		

## 2.2 Unusual rains (untimely, unseasonal etc) (for both rainfed and irrigated situations)

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
<b>Continuous high rainfall in a short span leading to water logging</b>				
Rice	Proper drainage	Proper drainage	Drainage should be maintained properly and crop Harvested on time	Proper sun drying to avoid contamination and sprouting.
Maize	Proper drainage followed by earthing up	Proper drainage to prevent water logging	-do-	-do-
<b>Horticulture</b>				
Tomato	Provide drainage	Provide drainage	Harvesting at physiological maturity stage	Store in cool dry place, packed in crates, baskets, or polythene.
Brinjal	-do-	-do-	Harvest crop in immature stage with normal size, tender & have not lost culinary qualities.	Packed the fruit in perforated polythene bag and store at temperature of 10-11 °C & 92 % RH.
Cabbage	-do-	-do-	Provide drainage	Store in cool place
Peas	-do-	-do-	Harvest at green pod stage	Safe storage at low temperature and humidity.
Orange	-do-	-do-	Harvesting at proper maturity stage when the fruits attain full size, develop attractive colour with optimum sugar.	Storing at 8 – 10 °C with 85 – 90 % RH.
<b>Heavy rainfall with high speed winds in a short span</b>				
Rice	Drainage facility drain out excess water	Drainage facility to drain out excess water	Drainage facility should be constructed to drain out excess water and to prevent crop lodging and harvested at the earliest to prevent more crop loss	Sun drying to prevent contamination and sprouting of the harvested grains
Maize	Drainage facility drain	Drainage	Drain out excess water and to	Sun drying to prevent contamination and

	out excess water and earthing up should be done	facility drain out excess water followed by earthing up	prevent crop lodging and harvested at the earliest to prevent more crop loss	sprouting of the harvested grains
<b>Horticulture</b>				
Tomato	Proper drainage	Proper drainage	Proper drainage maintained and harvested	Proper sun drying to avoid contamination and sprouting
Brinjal	Proper drainage followed by earthing up	Continuous monitoring for water lodging	Harvest crop in immature stage with normal size, tender & have not lost culinary qualities.	Sun drying to prevent contamination and sprouting of the harvested grains
Cabbage	Provide drainage		Provide drainage	Store in cool place
Peas	Provide drainage	Provide drainage	Harvest at green pod stage	Store in cool dry place, packed in crates, baskets, or polythene.
Orange	Provide drainage	Provide drainage	Harvesting at proper maturity stage when the fruits attain full size, develop attractive colour with optimum sugar	Packed the fruit in perforated polythene bag and store at temperature of 10-11 °C & 92 % RH.
<b>Outbreak of pests and diseases due to unseasonal rains ( Long dry spell)</b>	-			
<b>Horticulture</b>				
Orange	Destroy the badly infested/infected plant parts	Spray suitable chemicals to prevent infestation	Avoid injury to fruits at harvesting to prevent disease infection	Safe storage against insect pest and diseases
Tomato	Destroy the badly infested/infected plant parts	Spray suitable chemicals to prevent infestation	Harvesting at the right stage and proper handling of the produce	Safe storage against insect pest and diseases
Brinjal	Destroy the badly infested/infected plant	Spray suitable chemicals to	Harvesting at the right stage and proper handling of the produce	Safe storage against insect pest and diseases

	parts	prevent infestation		
Cabbage	Destroy the badly infested/infected plant parts	Spray suitable chemicals to prevent infestation	Harvesting at the right stage and proper handling of the produce	Safe storage against insect pest and diseases
Peas	Destroy the badly infested/infected plant parts	Spray suitable chemicals to prevent infestation	Harvesting at the right stage and proper handling of the produce	Safe storage against insect pest and diseases

### 2.3 Floods:

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Transient water logging/ partial inundation</b>				
Rice	Proper drainage facility should be made available to prevent nursery loses.  Flood tolerant variety Gitesh from AAU may be used.	Proper drainage facility should be made available to maintain optimum level of water	Proper drainage facility should be made available to maintain optimum level of soil moisture	Proper drainage facility should be made available and harvesting should not be delayed
Maize	Proper drainage facility should be made available to prevent loses	Proper drainage facility should be made available to maintain optimum soil moisture and earthing up operation should be carried out regularly	Proper drainage facility should be made available to maintain optimum soil moisture	Proper drainage facility should be made available and harvesting should not be delayed
<b>Horticulture</b>				
Chilly	Rising seedling on raised nursery bed or proper drainage	Provide drainage	Proper drainage	Proper drainage & harvesting at green stage
Tomato	Rising seedling on raised nursery		Proper drainage	Harvesting at mature green

	bed or proper drainage	Provide drainage & staging to support the crop.		stage.
<b>Continuous submergence for more than 2 days</b>				
Rice	Nursery should be raised on an elevated location	Proper drainage facility should be made available to maintain optimum level of water	Proper drainage facility should be made available to maintain optimum level of soil moisture	Proper drainage facility should be made available and harvesting should not be delayed
Maize	Proper drainage facility should be made available to prevent loses	Proper drainage facility should be made available to maintain optimum soil moisture and earthing up operation should be carried out regularly	Proper drainage facility should be made available to maintain optimum soil moisture	Proper drainage facility should be made available and harvesting should not be delayed
<b>Horticulture</b>				
Chilly	Raising seedling on raised nursery bed or proper drainage	Provide drainage	Provide drainage	Proper drainage & harvesting at green stage
Tomato	Rising seedling on raised nursery bed or proper drainage	Provide drainage & staging to support the crop	Proper drainage	Harvesting at mature green stage.
<b>Sea water intrusion<sup>3</sup></b>	NA	NA	NA	NA

#### 2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone: Occasionally encountered

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Heat Wave</b>	NA			
<b>Cold wave</b>				
Rice	Cold tolerant varieties such as Megha Rice-1 and Megha rice-2 should be selected for cultivation. Re sowing may be done in case of severe damage.	Gap filling may be done in case of severe damage	If severely affected, proper crop planning should be done for rabi season to compensate the kharif loss.	Timely harvesting room dried and stored properly

Maize	Re sowing may be done in case of severe damage.	-do-	-do-	-do-
<b>Horticulture</b>				
Orange	-	-	Proper crop management for the succeeding years	Timely harvesting
Tomato	Resowing	Gap filling	Proper crop planning for rabi season	Harvesting at crop maturity
Brinjal	-do-	-do-	-do-	-do-
Cabbage	-do-	-do-	-do-	-do-
Peas	-do-	-do-	-do-	-do-
NA				
<b>Frost</b>				
<b>Hailstorm</b>				
Rice	Proper shade may be provided to protect the nursery from damage. Resowing may be done in case of severe damage	Gap filling may be done in case of severe damage	If severely affected, proper crop planning should be done for rabi season to compensate the kharif loss.	Harvesting on time, room dried and stored properly
Maize	Resowing may be done in case of severe damage	-do-	-do-	-do-
<b>Horticulture</b>				
Orange	Provide shade to protect from damage	-	Proper crop management for the succeeding years	Harvesting at crop maturity stage and proper storage
Tomato	Resowing may be done in case of severe damage	-	Proper crop planning for rabi season	Harvesting at crop maturity stage and proper storage
Brinjal	Resowing may be done in case of severe damage	-	-	-
	Resowing may be done in case of	-	-	-

Cabbage	severe damage			
Peas	Resowing		-	-
<b>Cyclone</b>	NA			

## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
<b>Drought</b>			
Feed and fodder availability	Insurance Encourage perennial fodder on bunds and waste land on community basis Establishing fodder banks, encouraging fodder crops in irrigated area Silage – using excess fodder for silage	Utilizing fodder from perennial trees and Fodder bank reserves Utilizing fodder stored in silos Transporting excess fodder from adjoining districts Use of feed mixtures	Availing Insurance  Culling unproductive livestock
Drinking water	Preserving water in the tank for drinking purpose Excavation of Bore wells	Using preserved water in the tanks for drinking Wherever ground water resources are available priority for drinking purpose	
Health and disease management	Veterinary preparedness with medicines and vaccines	Conducting mass animal Health Camps and treating the affected once in Campaign	Culling sick animals
<b>Floods</b>			
Feed and fodder availability	Insurance Establishing fodder banks	Utilizing fodder bank reserves Transporting excess fodder from adjoining districts Use of feed mixtures	Availing Insurance
Drinking water	Preserving water in the tank for drinking purpose	Using preserved water in the tanks for drinking	

Health and disease management	Veterinary preparedness with medicines and vaccines	Conducting mass animal Health Camps and treating the affected once in Campaign	Culling sick animals
<b>Cyclone</b>			
Feed and fodder availability	NA	NA	NA
Drinking water	NA	NA	NA
Health and disease management	NA	NA	NA
<b>Cold wave</b>			
Shelter/environment management	Insurance. Locally available straw (like Paddy, Maize) to used as bedding material on the floor in animal sheds to provide warming.	In case of extreme cold, animals particularly cattle be covered with blanket or cotton cloth during morning and evening. Dry fodder should be fed during morning and evening hours. Green leaves should be fed during the afternoon.	Availing insurance Culling unproductive livestock
Health and disease management	Veterinary preparedness with medicines and vaccines	Conducting mass animal Health Camps and treating the affected animals.	Culling sick animals / unproductive livestock.

**2.5.2 Poultry**

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
<b>Drought</b>				
Shortage of feed ingredients	Insurance & Integration Establishing feed serve Bank	Utilizing from feed serve banks	Availing insurance Strengthening feed Reserve Banks	



Drinking water	Reserving water in the tanks for drinking purpose	Using reserved water in the tanks for drinking	Continuous monitoring for any sign of health improvement or diseases	Low cost water harvesting structures( <i>Jalkund</i> ) may be provided to the farmers through RKVY, NABARD etc
Health and disease management	Emergency Veterinary preparedness with medicines vaccination	Campaign and Mass Vaccination	Culling affected birds	Technical assistance by KVK and input supply by ATMA and Veterinary Department, Wokha
<b>Floods</b>				
Shortage of feed ingredients	Insurance & Integration Establishing feed serve Bank	Utilizing from feed serve banks Transporting excess feeds from adjoining districts Use of feed mixtures	Availing insurance Strengthening feed Reserve Banks	
Drinking water	Reserving water in the tanks for drinking	Using reserved water in the tanks	Continuous monitoring for any sign of health improvement or diseases	Water harvesting tanks may be provided to the farmers through RKVY, NABARD etc
Health and disease management	Emergency Veterinary preparedness with medicines vaccination to birds	Campaign and Mass Vaccination	Culling affected birds	Technical assistance by KVK and input supply by ATMA and Veterinary Department, Wokha
<b>Cyclone</b>	NA			
<b>Cold wave</b>				
Shelter/environment management	Insurance. Poultry shed/ house should be covered by plastic sheet or jute bags to prevent from cold wave.	Maintenance of temperature at the shed/ house i.e. 19 – 27 °C. Feeding of high caloric feed during cold weather.	Availing insurance.	Technical assistance by KVK and input supply by ATMA and Veterinary Department, Wokha, RKVY, NABARD etc

		Provisions of sufficient lighting in poultry shed/ houses.		
Health and disease management	Emergency veterinary preparedness with medicines and vaccines	Campaign and mass vaccination. Treating of affected birds.	Culling of affected birds.	Technical assistance by KVK and input supply by ATMA and Veterinary Department, Wokha

### 2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
<b>1) Drought</b>			
<b>A. Capture</b>			
Marine	NA		
Inland			
(i) Shallow water depth due to insufficient rains/inflow	Increase pond water depth wherever possible	Thinning of fish stocks population	Renovation of ponds followed by refilling of ponds, fertilization & stocking.
(ii) Changes in water quality	Assessment of different water parameters such as temperature, pH, dissolved water level.	Correction of abnormal fluctuation in water parameters/ quality	Reassessment of the different water parameters after correction by maintaining optimum water quality.
<b>B. Aquaculture</b>			
(i) Shallow water in ponds due to insufficient rains/inflow	Increase pond water depth wherever possible	Thinning of fish stocks population	Renovation of ponds followed by refilling of ponds, fertilization & stocking.
(ii) Impact of salt load build up in ponds / change in water quality	NA		
<b>2) Floods</b>	NA		
<b>B. Aquaculture</b>			

(i) Inundation with flood water	Harvesting the fish stocks & dewatering of ponds and reinforcement of pond embankments	Proper maintenance of side drains, inlets & outlets of ponds	Refilling of ponds followed by pond fertilization and stocking.
(ii) Water contamination and changes in water quality	Assessment of different water parameters such as temperature, pH, dissolved water level.	Correction of abnormal fluctuation in water parameters/ quality	Reassessment of the different water parameters after correction by maintaining optimum water quality.
(iii) Health and diseases	Arrangement for medicines	Treating with medicines	Removal of diseased stock
(iv) Loss of stock and inputs (feed, chemicals etc)	-	-	-
(v) Infrastructure damage (pumps, aerators, huts etc)	-	-	-
<b>3. Cyclone / Tsunami</b>	NA		
<b>4. Heat wave and cold wave</b>	NA		