AGRICULTURE CONTINGENCY PLAN FOR

LUNGLEI DISTRICT, MIZORAM

2018

KRISHI VIGYAN KENDRA

LUNGLEI DISTRICT, HNAHTHIAL

1.0 District Agriculture profile*				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	**Humid Eastern Himalayan Region**		
	Agro-Climatic Zone (Planning Commission)	**Eastern Himalayan Region (2)**		
	Agro Climatic Zone (NARP)	**North-Eastern Hills (Purvachal), warm per humid eco-region with red and lateritic soil and GP<210 days**		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	**All District of Mizoram**		
	Geographic coordinates of district headquarters	**Latitude**	**Longitude**	**Altitude**
		22.03°N - 23.18°N	**92.15°E - 93.10°E**	**1163 mtr**
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	**ICAR Research Complex for NEH Region, Mizoram Centre, Kolasib, 796081, Mizoram**		
	Mention the KVK located in the district with full address	**Krishi Vigyan Kendra, Lunglei District** **Hnahthial – 796571. Mizoram** **Ph No: 0372-2332637, Email – *kvklunglei@gmail.com/ kvkhnahthial@gmail.com***		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	**Automatic Weather Station installed at KVK Complex, Hnahthial by ISRO**		

 # Source: Statistical Handbook, Mizoram 2014

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	1376.85	72.50 ..	. 1st week of June	Last week of September
	NE Monsoon(Oct-Dec):	85.83	07	3rd week of October	2nd week of December
	Winter (Jan- February)	12.75	03	1st week of Jan	2nd week of Feb
	Summer (March-May)	535.75 .	32.55 .	4th week of March .	2nd week of May .
	Annual	1912.60 .	105.05 .	-	-

 # Source: ***Source: Statistical Abstract, Department of Agriculture (Crop Husbandry), Mizoram, 2011-12***

1.3	**Land use pattern of the district** (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	453.8 ha	16.576	354.458 ha	16.964 ha	1.530 ha	1.652 ha	27.334 ha	1.050 ha	5.140 ha	28.011 ha

 # Source: ***Statistical Abstract, Department of Agriculture (Crop Husbandry), Mizoram, 2012-13***

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area (‘000 ha)****	**Percent (%) of total geographical area**
	1. Laterite soil	195.048	43
	2. Alluvial soil	163.296	36
	3. Forest soil	149.688	33

1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	16.576	113.5
	Area sown more than once	0.400	
	Gross cropped area	18.819	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	0.472		
	Gross irrigated area	0.472		
	Rainfed area			
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals			Area may be indicated
	Tanks			
	Open wells			
	Bore wells			
	Lift irrigation schemes			
	Micro-irrigation			
	Other sources (please specify)	Rain water		
	Total Irrigated Area			
	Pump sets			

	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical			
	Safe			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

 # Source: Statistical Abstract 2010-2011 Department of Agriculture (Crop Husbandry), Mizoram

1.7 Area under major field crops & horticulture

1.7	**S.No.**	**Major field crops cultivated**	**Area ('000 ha)**							
			Kharif			***Rabi***				
			Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	1	Paddy WRC		0.845 ha	0.845 ha		0.240 ha	0.240 ha		1.085 ha
	2	Jhum paddy		3.250 ha	3.250 ha					3.250 ha
	3	Maize		0.499 ha	0.499 ha		0.019 ha	0.019 ha		0.518 ha
	4	Sesamum		0.815 ha	0.815 ha		-	-		0.815 ha
	5	Tapioca		0.049 ha				-		0.049 ha
	6	Ginger		-	0.598 ha		-	-		0.598 ha

	7	Sugarcane		-	0.173 ha		-	-		0.173 ha
	8	Field Pea					0.049 ha	0.049 ha		0.049 ha
	9	Cow Pea		0.094 ha	0.094 ha		0.007 ha	7 ha		0.101 ha
	Others (specify)									

 # Source: Agriculture Statistical Abstract Department of Agriculture, Crop Husbandry 2016-2017

	S.No.	**Horticulture crops - Fruits**	**Area ('000 ha)**		
			Total	**Irrigated**	**Rainfed**
	1	Mandarin Orange	0.587 ha		0.587 ha
	2	Banana	0.3135 ha		0.3135 ha
	3	Pineapple	0.140 ha		0.140 ha
	4	Papaya	0.0285 ha		0.0285 ha
	Others (specify)				
		Horticulture crops -	**Total**	**Irrigated**	**Rainfed**

		Vegetables			
	1	Cabbage	0.0405 ha	0.0405 ha	
	2	Tomato	0.02645ha	0.02645ha	
	3	Bird eye chilli	0.02 ha		0.02 ha
	Others (specify)				
		Medicinal and Aromatic crops	**Total**	**Irrigated**	**Rainfed**
	1				
	2				
	3				
	4				
	5				
	Others (specify)				
		Plantation crops	**Total**	**Irrigated**	**Rainfed**
	1	Tea	0.008 ha		0.008 ha
	2	Arecanut	0.084 ha		0.084 ha

	Others (Specify)	Eg., industrial pulpwood crops etc.			
		Fodder crops	**Total**	**Irrigated**	**Rainfed**
	1				
	2				
	3				
	4				
	5				
	Others (Specify)				
		Total fodder crop area			
		Grazing land, reserve areas etc			
		Availability of unconventional feeds/by products			

		eg., breweries waste, food processing, fermented feeds bamboo shoots, fish etc			
		Sericulture etc **Other agro enterprises (mushroom cultivation etc specify)**			
		Others (specify)			

 # Source: Department of Horticulture, Lunglei District 2016-2017

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Indigenous cattle			4.188
	Improved / Crossbred cattle			1.535
	Buffaloes (local low yielding)			0.039
	Improved Buffaloes			
	Goat			5.656
	Sheep			0.010
	Pig			31.541
	Mithun			
	Yak			
	Dog			6.125
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial			

	Backyard			225104			
1.10	**Fisheries** (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		NA	**NA**	**NA**	**NA**	**NA**	**NA**
	ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
	B. Culture						
				Water Spread Area (ha)	**Yield (t/ha)**	**Production ('000 tons)**	
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)			**NA**	**NA**	**NA**	
	ii) **Fresh water** (Data Source: Fisheries Department)			**NA**	**NA**	**NA**	
	Others						

 # Source: Livestock census of India, 2011

1.11 Production and Productivity of major crops (Average of last 5 years)

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)	
Major Field crops (Crops to be identified based on total acreage)										
Crop 1	Jhum Paddy	3.9	1945					3.90	1945	
Crop 2	Paddy WRC	2.006	2587	0.25				2.256	2340	
Crop 2	Maize	1.661		0.036				1.697	2062	
Crop 3	Tapioca							0.419	3521	
Crop 4	Rice bean							0.13	2045	
Crop 5	Arhar							0.034	1103	
Crop 6	Field Pea							0.035	1125	
Crop 7	Cow pea							0.104	1652	
Others										
Major Horticultural crops (Crops to be identified based on total acreage)										
Crop 1	M. Orange							3.029	5.40	
Crop 2	Banana							1.508	4.50	
Crop	Pineapple							1.216	3.80	

3										
Crop 4	Papaya							0.126	3.50	
Crop 5										
Others										

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Crop 1: Jhum Paddy/ Maize	2: WRC Paddy/ Cow pea/ Sesame	3: Soyabean	4: Rape seed and Mustard	5: Cabbage/ Cauliflower /Tomato
	Kharif- Rainfed	April- May	June- July	July- August		
	Kharif-Irrigated					
	Rabi- Rainfed					
	Rabi-Irrigated				Sept- Oct	Oct- Nov
	Summer-irrigated					
	Summer-rainfed					

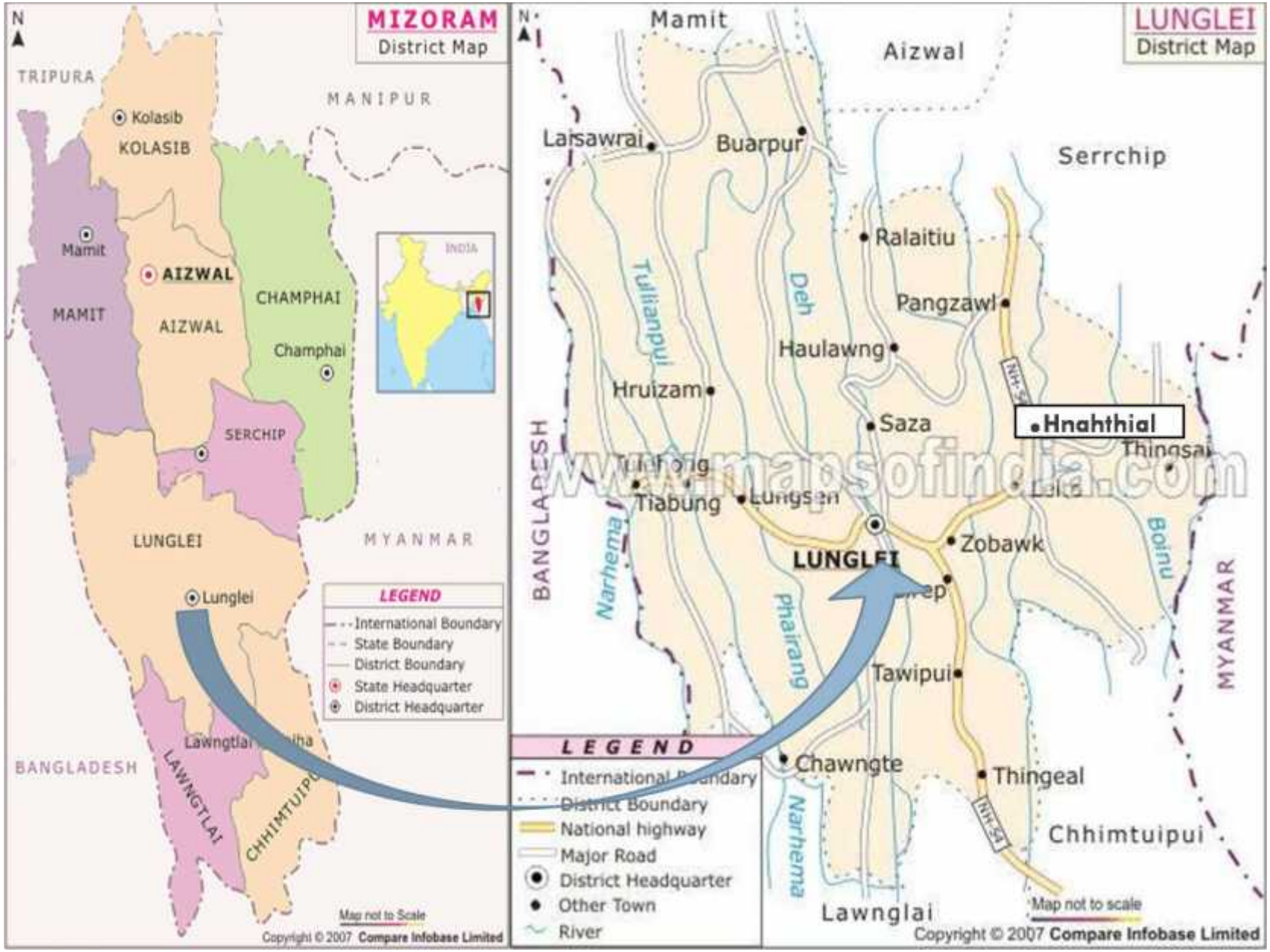
1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular***	**Occasional**	**None**
	Drought		√	
	Flood (Flash floods)		√	
	Cyclone (Storm)		√	
	Hail storm		√	
	Heat wave			√
	Cold wave			√
	Frost			√
	Sea water intrusion			√
	Snowfall			√
	Landslides		√	

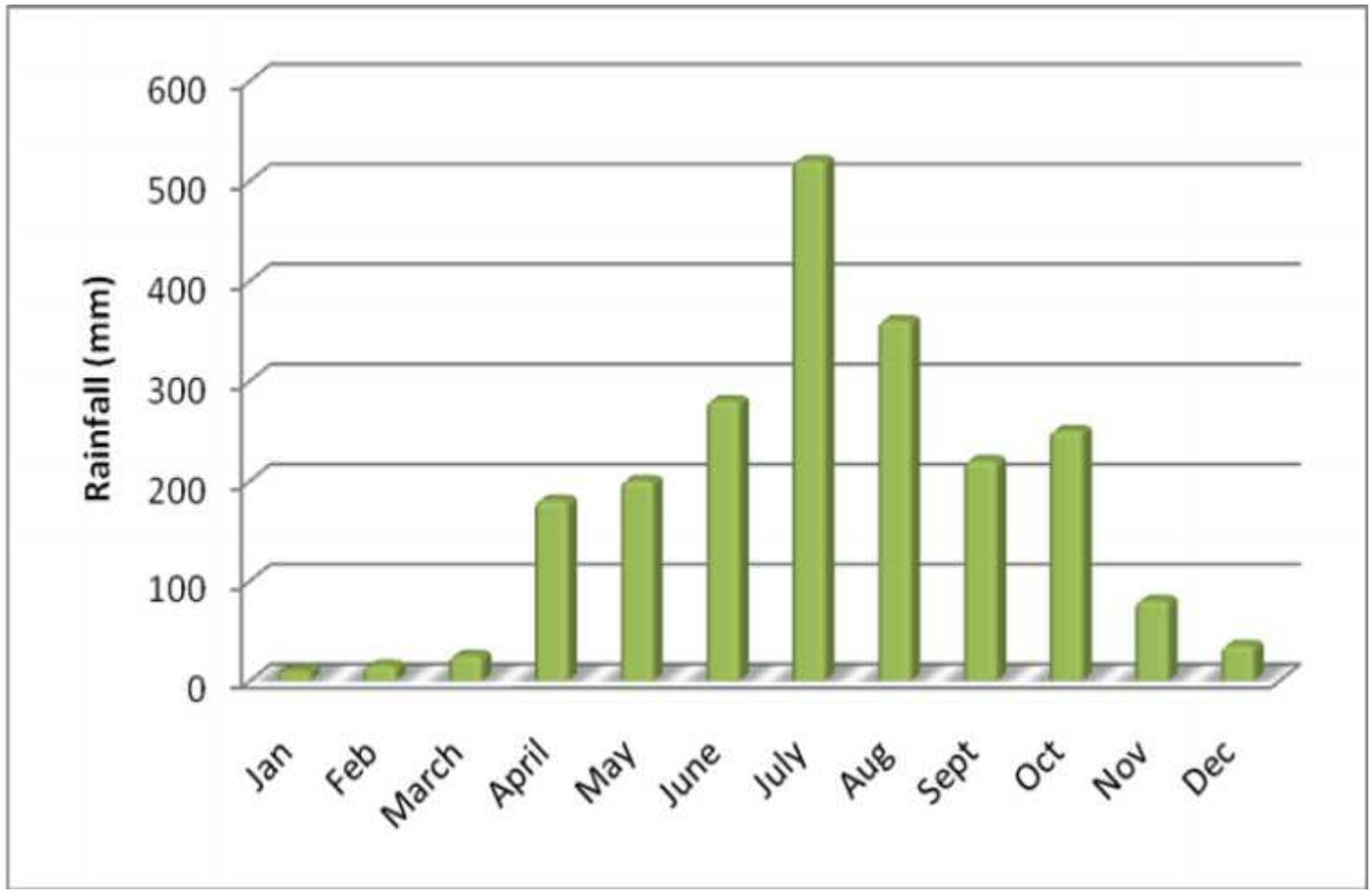
	Earthquake		√	
	Pests and disease outbreak (specify)		√	
	Others (like fog, cloud bursting etc.)			

*When contingency occurs in six out of 10 years

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

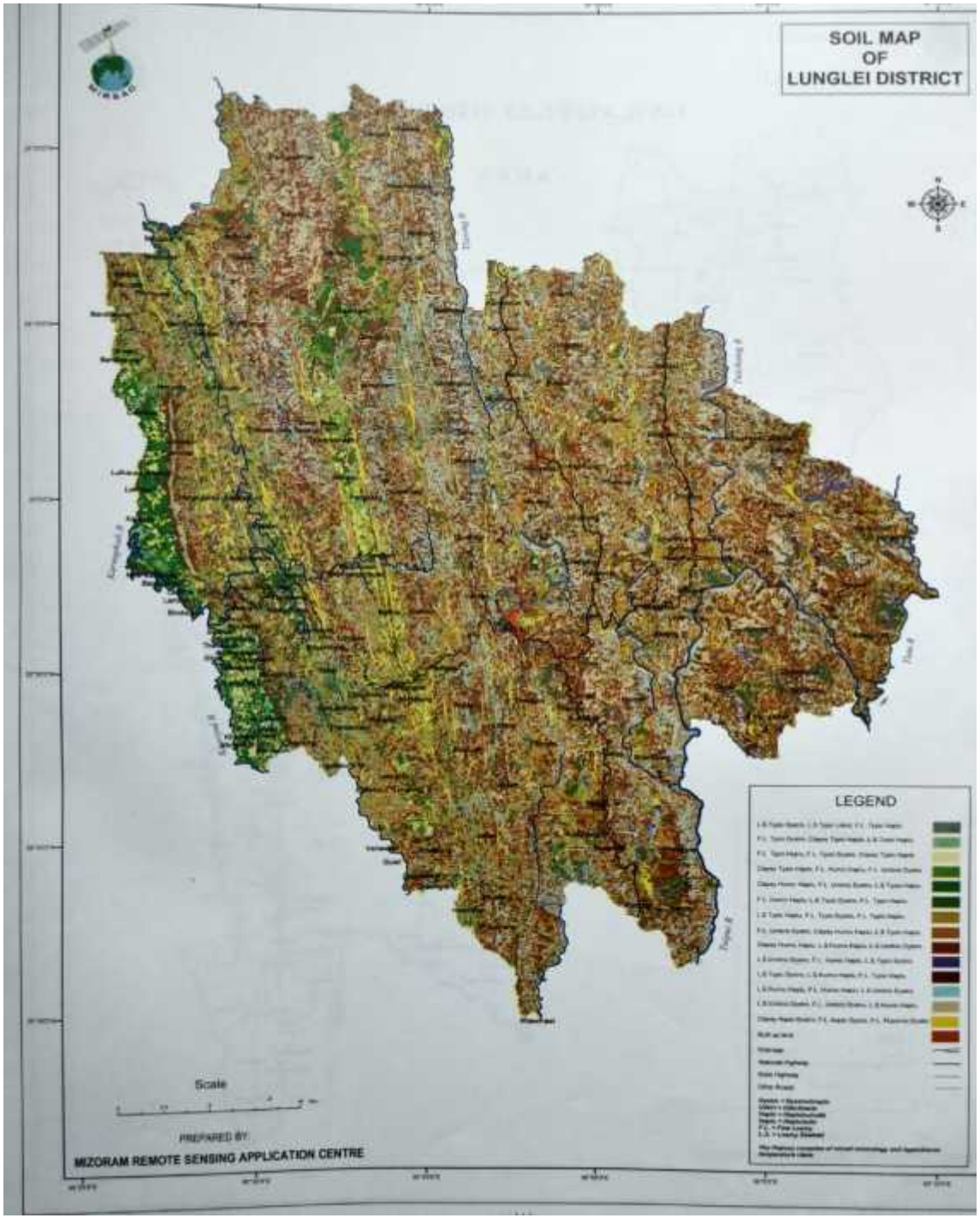
Annexure I: Location Map of Lunglei District





Annexure 2: Average Mean annual rainfall of Lunglei District

Annexure III: Soil Map of Lunglei District



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

2.1.1.1 Pre monsoon (Last week of March)

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/ Cropping system[b]**	**Change in crop/cropping system[c] including variety**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 2 weeks (2nd week of April)	Early rice	Mangbuh, Idaw (Local)	No change	-	-
Delay by 4 weeks (4th week of April)	Early rice	Buhsakei, Idaw, Fazai,Farel (Local)	No change	-	-
Delay by 6 weeks (6th week of)	NA				
Delay by 8 weeks (Specify month)	NA				

2.1.1.2 Southwest monsoon (First week of June)

Condition	***Suggested Contingency measures***				
Early season drought (delayed onset of monsoon)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures including soil and water conservation, life saving irrigation, nutrient sprays, etc.**	**Remarks on Implementation**

Delay by 2 weeks (3rd week of June)	1) Rainfed Upland /Jhum with Rich Alluvial Soil	1) Paddy+ Ginger +Bird's eye Chilli,	No change	Logwood bunding on sloppy land, Sowing can be delayed with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	Supply of seeds through State Dept. ATMAs & KVKs
		2) Ginger (sole crop)	No change	Logwood bunding on sloppy land, Sowing can be delayed with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	
		3) Bird's eye chilli (sole crop)	No change	Logwood bunding on sloppy land, Sowing can be delayed with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	
		4) Maize (sole crop)	No change	Logwood bunding on sloppy land, Sowing can be delayed with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	
		Horticulture crops: Cabbage French Bean Cow pea Brinjal	No change	Logwood bunding on sloppy land, Sowing can be delayed with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	
	2)Terrace / mid land with no irrigation facility with rich alluvial soil	1.Rice 2. Maize 3. Soyabean	RCM7, CAUR1, Maubuh RCM 75, HQPM5 RCS1-1, RCS1-9, RCS1-10	Normal sowing, Logwood bunding on sloppy land, Sowing can be delayed with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	Promote optimum water supply system,

		Horticulture crops: Passion Fruit Pineapple Banana M. Orange	No change	Mulching with organic materials, Earthing up, half moon terraces. Bunding, check dams, promote WHS	WHS
	3) Rainfed Low land	Rice	Paddy var. RCM-10, RCM-11, Buhsakei, CAU R1,	Deep ploughings (3 times), application of fertilizers & manures, Late sowing	
Delay by 4 weeks (1st week of July)	1) Upland /Jhum Rich Alluvial Soil	Rice + Maize + Cucumber	Rice : local short duration var. Idaw, tai, Mangbuh, CAU R1 Maize: Local sticky maize, HQPM Cucumber: Var. Local Local vegs	Late sowing, Sowing by dibbling, Interculture operations, Mulching Earthing up, Log/ bamboo bunding to conserve run –off water & top soil, Spraying of 0.2 % Urea spraying of 0.2 % Potash	
		Ginger	Local var. Thingpui, Thinglaidum, & Thingria,	Mulching with organic materials, Earthing up, Spraying of 0.2 % Urea spraying of 0.2 % Potash	
		Bird's eye chilli	Local variety	Mulching,Spraying of 0.2 % Urea spraying of 0.2 % Potash	
		Horticulture crops Cabbage French Bean Cow pea Brinjal	1. Cabbage var. Ryozeki, Indam 1299, Improved Bahar 2. French Bean var. Local, Arka Komal, Arka Sharat 3. Cow pea var. Local 4. Brinjal var. Rajni, Arka Anand, Pusa Kranti	Logwood bunding on sloppy land, Sowing can be delayed up to May with anticipation of rain. Ridge & Furrow /Raised bed sowing in plain areas and in Terraces. Dibbling instead of broadcasting.	
	2) Terrace / mid land with no irrigation facility	Rice	Mangbuh,Tai	Late sowing, Application of slaked lime & organic manure, Mulching with available bio-mass, Frequent inter-culture operations, Spraying of 0.2 % Urea spraying of 0.2 % Potash	
		Perennial crops Pineapple, Banan, M. Orange	No change	Mulching, Application of slaked lime & organic manure	

	3) Low land with irrigation facility	Rice	Short duration varieties by system of rice intensification	Deep ploughing Application of organic manure Late sowing	
	4) Low land without irrigation facility	Rice	Short duration varieties by system of rice intensification	Deep ploughing Application of organic manure Late sowing	
		Lowland Paddy	Nursery preparation	Dry & Wet bed method	
Delay by 6 weeks (July 3rd week)		NA	NA	NA	NA
Delay by 8 weeks (August 1st week)		NA	NA	NA	NA

Condition			***Suggested Contingency measures***		
Early season drought (Normal onset)	**Major Farming situation[a]**	**Normal Crop/cropping system**	**Crop management[c]**	**Soil nutrient &moisture conservation measure**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination /crop stand etc.	1) Up land/ Jhum Rich Alluvial soil	1. Rice based 2. Ginger 3. Bird's eye chilli	Weeding Gap filling Plant protection measures Use of drought resistant variety local var	Wood log/ bamboo bunding Mulching Earthing up, Optimum irigation technique	To create awareness on moisture management technique.
	2) Terrace/ Mid land Red Alluvial soil	1. Rice 2. Fruit crops	Intercultural operations Gap filling Plant protection measures	Aplication of organic manure, Mulching with biomass, Earthing up Half moon terracing for M. Orange	

	3) Low land with irrigation facility Clayey loam	Rice	Weeding Gap filling Plant protection measures	SRI	
	4) Low land without irrigation facility Sandy loam	Rice	Weeding Gap filling Plant protection measures	SRI	

Condition			***Suggested Contingency measures***		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	1) **Farming situation:** Up land/ Jhum Rich Alluvial soil	1. Rice based	Weeding, mulching with locally available organic materials Plant protection measures	Efficient use of store water for life saving irrigation.	Create awareness on soil conservation measures
		2. Ginger	Weeding, mulching with locally available organic materials PP measures	Mulching with locally available organic materials Earthing up	
		3. Bird's eye chilli	Weeding , mulching with locally available organic material Thinning PP Measures	Mulching with bio mass Earthing up	
	2) Terrace/ Mid land Red Alluvial soil	Rice	Weeding PP Measures Dripping & Wetting method	Earthing up up Mulching with locally available organic materials	
		Fruit crops – Pineapple, Banana, M. Orange	Weeding PP Measures Dripping & Wetting method	Earthing up up, Mulching with available biomass, use of cover crops. Half /fullmoon terrace.	
	3) Low land with irrigation	Rice	Need based PP measures	Wetting & drying	

	facility Clayey loam				
	4) Low land without irrigation facility Sandy loam	Rice	PP measures	Wetting & drying	

Condition			***Suggested Contingency measures***		
Mid season drought (long dry spell)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management**	**Soil nutrient and moisture conservation measures.**	**Remarks on Implementation**
At flowering/ fruiting stage	1) Up land/ Jhum Rich Alluvial soil	1. Rice based	Tolerant/ resistant varieties Plant protection measures	Earthing up, mulching with locally available materials	**NA**
		2. Ginger	Weeding PP measures	Mulching with bio mass Earthing up	
		3. Bird's eye chilli	Weeding PP Measures	Mulching with bio mass Earthing up	
	2) Farming situation: Terrace/ Mid land Red Alluvial soil	Rice	PP Measures Dripping & Wetting method	Earthing up Mulching with available biomass	
		Fruit crops – Pineapple, Banana, M. Orange	PP Measures Dripping & Wetting method	Earthing up Mulching with available biomass	
	3) Low land with irrigation facility Clayey loam	Rice	Need based PP measures	Wetting & drying	
	4) Low land without irrigation facility Sandy loam	Rice	PP measures	Wetting & drying	
Condition			**Suggested Contingency measures**		
Terminal drought	**Major Farming**	**Normal Crop/cropping**	**Crop management**	**Rabi Crop planning**	**Remarks on**

(Early withdrawal of monsoon)	**situation**	**system**			**Implementation**
	1) **Farming situation:** Up land/ Jhum Rich Alluvial soil	1. Rice based	Plant protection measures	Cole crops, tomato, leafy mustard, French bean, Onion, garlic,	Contour trench formation.
		2. Ginger	Weeding PP measures	NA	
		3. Bird's eye chilli	Weeding PP Measures	NA	
	2) Farming situation: Terrace/ Mid land Red Alluvial soil	Rice	PP Measures Dripping & Wetting method	French bean, soybean, groundnut, maize,	
		Fruit crops – Pineapple, Banana, M. Orange	PP Measures Dripping & Wetting method	NA	
	3) Low land with irrigation facility Clayey loam	Rice	Need based PP measures	NA	
	4) Low land without irrigation facility sandy loam	Rice	PP measures	Cole crops, French bean, soybean, onion, garlic, field pea, brinjal, tomato, okra .	

***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)**

Normal onset (Month and week)	**Month and week for specifying condition of early season drought due to delayed onset of monsoon**			
	Delay in onset of monsoon by			
	2 wks	**4 wks**	**6 wks**	**8 wks**
June 1st wk	June 3rd wk	July 1st wk	July 3rd wk	Aug 1st wk
June 2nd wk	June 4th wk	July 2nd wk	July 4th wk	Aug 2nd wk
June 3rd wk	July 1st wk	July 3rd wk	Aug 1st wk	Aug 3rd wk
June 4th wk	July 2nd wk	July 4th wk	Aug 2nd wk	Aug 4th wk
July 1st wk	July 3rd wk	Aug 1st wk	Aug 3rd wk	Sep 1st wk
July 2nd wk	July 4th wk	Aug 2nd wk	Aug 4th wk	Sep 2nd wk

2.1.2 Drought - Irrigated situation

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Delayed release of water in canals due to low rainfall	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; **tankfed medium deep black soils**	Cropping system 1:	NA	NA	NA
		Cropping system 2:			
		Cropping system 3:			

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
	2) Farming situation:	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Limited release of water in canals due to low rainfall	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; **tankfed medium deep black soils**	Cropping system 1:	NA	NA	NA
		Cropping system 2:			
		Cropping system 3:	NA	NA	NA
	2) Farming situation:	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Non release of water in canals under delayed onset of monsoon in catchment	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; **tankfed medium deep black soils**	Cropping system 1:	NA	NA	NA
		Cropping system 2:			
		Cropping system 3:			
	2) Farming situation:	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour	Cropping system 1:	NA	NA	NA
		Cropping system 2:			
		Cropping system 3:			

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
	& depth Eg; canal irrigated shallow red soils; **Tube well irrigated medium red soils**				
	2) Farming situation:	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			
Insufficiency of surface water for irrigation					

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Insufficient groundwater recharge due to low rainfall	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; **tankfed medium deep**	Cropping system 1:	NA	NA	NA
		Cropping system 2:			
		Cropping system 3:			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
	black soils				
	2) Farming situation:	Cropping system 1:	NA	NA	NA
		Cropping system 2:			
		Cropping system 3:			
Any other condition (specify)			NA	NA	NA

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
Crop1 – Paddy	Provide drainage	Provide drainage	Drain out excess water	Dry in shade
Crop2 – Maize	Provide drainage	Provide drainage	Drain out excess water	Dry in shade
Crop3 – Sesamum	Provide drainage	Provide drainage	Drain out excess water	Dry in shade
Crop4 – Ginger	Provide drainage	Provide drainage	Provide drainage	Dry place
Crop5 – Sugarcane	Provide drainage	Provide drainage	Drain out excess water	Dry in shade
Horticulture				
Crop1 – Mandarin Orange	Provide drainage	Earthing up	Drain out excess water	Provision of proper storage
Crop2 – Banana	Provide drainage	Earthing up	Drain out excess water	Provision of proper storage
Crop3 – Pineapple	Provide drainage	Earthing up	Drain out excess water	Provision of proper storage

Crop5 – Vegetables	Seedling raised in nursery beds	Earthing up	Drain out excess water	Provision of proper storage
Heavy rainfall with high speed winds in a short span[2]				
Crop1 – Paddy	Drainage in water logging area	Drainage	Large panicles is to be harvested at physiological maturity stage	Drainage required
Crop2 – Maize	Drainage to be provided	Drainage	Large cob may be harvested at physiological maturity stage	Shift to safe dry place
Horticulture				
Crop1 – Banana	Provide drainage	Earthing up/ Propping	Physiological matured fruits may be harvested	Provision of proper storage
Crop2 – Pineapple	Provide drainage	Earthing up	Physiological matured fruits may be harvested	Provision of proper storage
Outbreak of pests and diseases due to unseasonal rains				
Crop1 – Paddy	Proper ploughing, Light trap, Soil application of phorate, Spray monochrotophos, chloropyriphos	Spray dithane M-45,monochrotophos, conservation of natural enemies	Spray malathion, quinalphos, conservation of natural enemies	Sun drying
Crop2 – Maize	Spray imidachloprid, Seed treatment with carbendazim, intercrop with leguminous crop	Spray monochrotophos, dimethoate	Monitoring crops against attack of birds	Dry place
Crop1 – Fruits	Spraying of fungicide,	Spraying of	Spraying of	Store at clean & dry

	bordeaux mixture, micro-nutrients	growth hormones, micro-nutrients	fungicide/insecticide	place
Crop2 – Vegetables	Spraying of malathion	Spraying of fungicide/insecticide	Spraying of fungicide/insecticide	Provision of proper storage
Crop3				
Crop4				
Crop5				

2.3 Floods

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Crop1 (specify)	.NA	NA.	NA.	..NA
Crop2				
Crop3				
Crop4				
Crop5				
Horticulture /Plantation crops	.NA	NA.	NA.	..NA
Crop1 (specify)				
Crop2				
Crop3				
Crop 4				
Crop 5				

Continuous submergence for more than 2 days[2]	.NA	NA.	NA.	..NA
Crop1				
Crop2				
Crop3				
Crop4				
Crop5				
Horticulture / Plantation crops	.NA	NA.	NA.	..NA
Crop1 (specify)				
Crop2				
Crop3				
Crop 4				
Crop 5				
Sea water intrusion[3]	.NA	NA.	NA.	..NA
Crop1				
Crop2				
Crop3				
Crop4				
Crop5				

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

Extreme event type	**Suggested contingency measure[r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave[p]	NA	NA	NA	NA

Crop1				
Crop2				
Crop3	**Provide Shade**			
Crop4				
Crop 5				
Horticulture	.NA	NA.	NA.	..NA
Crop1 (specify)				
Crop2				
Crop3				
Cold wave[q]	NA	NA	NA	NA
Crop1				
Crop2				
Crop3				
Crop4				
Crop 5				
Horticulture				
Crop1 (specify)				
Crop2				
Crop3				
Frost	NA	NA	NA	NA
Crop1				
Crop2				
Crop3				
Crop4				

Crop 5				
Horticulture	.NA	NA.	NA.	..NA
Crop1 (specify)				
Crop2				
Crop3				
Hailstorm				
Crop1 - Paddy	Re-sowing	Gap filling	-	Harvest at physiological maturity
Crop2 - Maize	Re-sowing	Re-sowing	-	Harvest at physiological maturity
Crop3				
Crop4				
Crop 5				
Horticulture				
Crop1 – Banana/Mandarin orange	Re-planting	Replanting/Application of fungicide		Harvest at physiological maturity
Crop2 - Vegetables	Re-sowing	Provisions of Shade net	Provisions of Shade net	Harvest at physiological maturity
Crop3				
Cyclone				
Crop1 – Paddy	Re-sowing	Re-planting & Gap filling	-	Harvest at physiologic

				al maturity
Crop2 - Maize	Re-sowing	Re-sowing	-	Harvest at physiological maturity
Crop3	**Installation of windbreaks**			
Crop4				
Crop 5				
Horticulture				
Crop1 - Banana/Mandarin orange	Re-planting	Provisions of wind break/Shade net	Provisions of wind break/Propping for banana	Harvest at physiological maturity
Crop2 - Vegetables	Re-sowing	Provisions of wind break/Shade net	Provisions of wind break/Shade net	Harvest at physiological maturity
Crop3				
Sand deposition or heavy siltation	.NA	NA.	NA.	..NA
Specify crop/horticulture/plantation				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event[s]	**During the event**	**After the event**
Drought			
Feed and fodder availability	1. Storage of feed ingredients maize, rice polish etc. 2. Storage of rice straw silage making 3. Cultivation of perennial grass, fodder grass etc.	1. Restricted Stall feeding 2. Non-conventional feeds, kitchen waste etc especially for pigs	1. Rain fed cultivation of both perennial and seasonal fodder 2. Utilization of fodder tree leaves.
Drinking water	1. Provision of either shallow tube well or ring well/Storage of water 2. Community water tank if possible	1. Economizing of water use 2. Utilization of shallow tube or ring well 3. Community water tank if possible	1. Community water tank if possible
Health and disease management	1. Vaccination programs 2. Anti-stress management	1. Heat stress management with restricted movement 2. Showering facility	1. Health tonics and Vitamins 2. Disease management
Floods (Flash)			
Feed and fodder availability	Training on fodder management	Supply silage or urea molasses block	Easy access to feed and fodder
Drinking water	Clean and healthy drinking water	Supply clean water and water treatment	Provision of clean drinking water
Health and disease	Training and prevention	Supply medicines, conducting health	Supply medicines and

management	against diseases	camp	proper disposal of carcass	
Cyclone (Storm)				
Feed and fodder availability	Storing of feed and fodder in safe place	Supplementary feeding of livestock	Plan accordingly for next year	
Drinking water	Preserved water with sanitization	Arrange chlorine tablets for sanitization and bleaching the water for sanitization	Provision of clean drinking water	
Health and disease management	Livestock insurance and vaccination	Conducting animal health camps and treating the affected animals	Culling and proper disposal of death animals	
Heat wave and cold wave	NA	NA	NA	NA
Shelter/environment management				
Health and disease management				
Snowfall	NA	NA	NA	NA
Earthquake				
Landslides	Livestock insurance and vaccination, shifting to safer place	Animal health camp, shifting to safer place, rescue work, evacuation	Providing shelter, clean drinking water, food, treatment, disposal of dead animals and disinfection of infected areas	

[s] based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event[a]	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients	Early storage of feed ingredients	1. Economize feeding 2. Reduction of stock if possible	1. Restricted feeding 2. Reduction of stock if possible	NEDP (New Economic Development Policy)
Drinking water	Provision of water storage	Economize use of water	Economize use of water	
Health and disease management	Vaccination program/Biosecurity	Regular health inspection/Nutrient managemet/Stress management	Stress management/Quarantine of sick animals	
Floods				
Shortage of feed ingredients	Proper feed go-down	Shifting of feeds to higher place	Vitamin and mineral supplementation	NEDP (New Economic Development Policy)
Drinking water	Storage of clean water	Water treatment	Provision of clean water	
Health and disease management				
Cyclone				
Shortage of feed ingredients	Insurance of poultry farm	Supply the compound feed to the poultry farm	Provision of supplementary feeding with vitamins & minerals	NEDP (New Economic Development Policy)

Drinking water	Protecting the water sources	Attempt will be made to provide sanitized drinking water	Application of bleaching powder to sanitized the water	
Health and disease management	Procurement of vaccine & medicine	Feeding antibiotic	Disinfection of sheds and replace wet litters	NICRA
Heat wave and cold wave	NA	NA	NA	NA
Shelter/environment management				
Health and disease management				
Snowfall	NA	NA	NA	NA
Earthquake, Landslides etc	Insurance, shifting to safer place	Conducting free clinic and rescue work	Providing clean drinking water, food, treatment, disposal of dead birds and disinfection of infected areas	NEDP (New Economic Development Policy)

[a] based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1) Drought	NA	NA	NA
A. Capture			
Marine			

Inland			
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow			
(ii) Impact of salt load build up in ponds / change in water quality			
(iii) Any other			
2) Floods	NA	NA	NA
A. Capture			
Marine			
Inland			
(i) Loss of stock			
(ii) Changes in water quality			
(iii) Health and diseases			
B. Aquaculture	NA	NA	NA
(i) Inundation with flood water			
(ii) Water contamination and changes in water quality			

(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, huts etc)			
(vi) Any other			
3. Cyclone / Tsunami	NA	NA	NA
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
4. Heat wave and cold wave	NA	NA	NA

A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			