State: HARYANA

Agriculture Contingency Plan: KURUKSHETRA

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Punjab and Rohilkhand plains, hot dry, subhumid eco-subregionplains, hot dry, subhumid eco-subregion (9.1)		
	Agro-Climatic Region (Planning Commission)	Trans Gangetic Plain region (VI)		
	Agro Climatic Zone (NARP)*	Eastern Zone (HR-1)		
	List all the districts falling under the NARP Zone	Panchkula, Ambala, Yamunanagar, Kurukshetra, Karnal, Kaithal, Jind, Panipat, Sonipat, Faridabad, Mewat, Palwal and parts of Rohtak, Jhajjar and Gurgaon		
	Geographical coordinates of district	Latitude	Longitude	Altitude
		29º57'58.92" N	76º49'42.79" E	283 M
	Name and Address of the concerned ZRS/ZARS/RARS/RRTTS	ZRS, Karnal – 132 001		
	Mention the KVK located in the district	Krishi Vigyan Kendra, 430/13 Urban Estate, Kurukshetra - 132118		
1.2	**Rainfall**	Average (mm)	Normal Onset (week and month)	Normal Cessation (week and month)
	SW monsoon (June-September):	535.3	1st week of July	3rd week of September
	NE Monsoon(October-December):	28.1	-	-
	Winter (January-February)	55.9		
	Summer (March-May)	26.4		
	Annual:	645.7		

1.3	**Land use pattern of the district** (latest statistics)	Total geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable waste land	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area (000 ha)	168	150	1	15	1	0.1	0.02	-	-	-

(Source: Statistical Abstract Haryana: 2007-08)

1. 4	**Major Soil types**	Area ('000 ha)	Per cent (%) of total geographical area
	Loamy soils (Alluvial)	78	46
	Sandy loam soils	63	37.5
	Others (specify)	-	-

1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	150	177
	Area sown more than once	116	
	Gross cropped area	266	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	150		
	Gross irrigated area	266		
	Rainfed area	-		
	Sources of Irrigation	Number	Area (‘000 ha)	% area
	Canals		27	18

	Tanks	-	-	-
	Open wells	-	-	-
	Bore wells	35116	123	82
	Lift irrigation	-	-	-
	Other sources	-	-	-
	Total	-	150	-
	Pumpsets	39945	-	-
	Micro-irrigation	-	-	-
	Groundwater availability and use	No. of blocks	% area	Quality of water
	Over exploited*	5	100	
	Critical	-	-	
	Semi- critical	-	-	
	Safe	-	-	
	Wastewater availability and use	-	-	
	Ground water quality	Alkaline in nature (EC: Nil, F: 1.78-2.06mg/l, As: nil, Fe: 1.45-2.86mg/l) (sodicity and Flouride problem)		

*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

1.7 Area under major field crops & Horticulture (2008-09)

1.7	**Major Field Crops cultivated**	**Area ('000 ha)***							
		Kharif			***Rabi***			**Summer**	**Grand Total**
		Irrigated	***Rainfed***	***Total***	***Irrigated***	***Rainfed***	***Total***		
	Rice	109							109
	Sugarcane (Gur)	15.2							15.2
	Wheat				110.3		110.3		110.3
	Rapeseed-mustard				0.9				0.9

	Horticulture crops - Fruits	**Total area**
	Mango	0.4
	Guava	0.2
	Peach, Plum, Pear	0.2
	Horticultural crops - Vegetables	**Total area**
	Potato	6.6
	Tomato	1.8
	Cauliflower	1.1
	Radish	1.1
	Medicinal and Aromatic crops	**-**
	Plantation crops	**-**
	Fodder crops	**-**
	Total fodder crop area	-
	Grazing land	-
	Sericulture etc	-
	Others (Specify)	-

1.8	**Livestock** (2008-09)			**Male ('000)**		**Female ('000)**	**Total ('000)**
	Cattle			-		-	83
	Buffaloes total			-		-	257
	Commercial dairy farms			-		-	-
	Goat			-		-	5
	Sheep			-		-	13
	Others (Camel, Pig, Yak etc)						16
1.9	**Poultry**			**No. of farms**		**Total No. of birds ('000)**	
	Commercial			NA		1317	
	Backyard			NA		59	
1.10	**Fisheries**						
	A. Capture						
	i) Marine (Data Source: Fisheries Dept.)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
			Mechnised	Non-mechnised	Mechnised (Trawl nets, Grill nets)	Non-mechnised (Shore seines, stake & trap nets)	

		-	-	-	-	-	NA
	ii) Inland (Data Source: Fisheries Dept.)	**No. Farmer owned ponds**		**No. of Reserviors**		**No. of village tanks**	
		NA					
	B. Culture						
		Water Spread Area (ha)		**Yield (t/ha)**		**Production ('000 tons)**	
	i) Brakish water (Data source: MPEDA/Fisheries Dept.)	NA					
	ii) Fresh water (Data source: Fisheries Dept.)						
	Others						

1.11 Production and Productivity of major crops (Average of last 3 years: 2006,07, 08)

1.11	Name of crop	**Kharif**		**Rabi**		**Summer**		**Total**	
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
	Wheat	-	-	514	4672	-	-	514	4672
	Rice	440	4038	-	-	-	-	440	4038
	Sugarcane (Gur)	103.4	6894	-	-	-	-	103.4	6894
	Rapeseed-mustard	-	-	-	-	-	-		
	Major Horticultural crops								
	Mango	2578	-	-	-	-	-	-	-
	Guava	1020	-	-	-	-	-	-	-
	Peach, Plum, Pear	1625	-	-	-	-	-	-	-
	Major Horticultural crops								
	Potato	-	-	-	-	-	-	-	-
	Tomato	-	-	-	-	-	-	-	-
	Cauliflower	-	-	-	-	-	-	-	-
	Radish	-	-	-	-	-	-	-	-

(Source: Statistical Abstract Haryana)

1.12	**Sowing window for 5 major crops** (start and end of sowing period)	**Wheat**	**Rice**	**Sugarcane**	**Rapeseed & Mustard**
	Kharif- Rainfed	-	-	-	-
	Kharif-Irrigated	-	15 May – 30 June	Mid February – End of March	-
	Rabi- Rainfed	-	-	-	-
	Rabi-Irrigated	October end – 15 November	-	-	September end – 20 October

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 inundation	-	-	√
	Pests and diseases	-	√	-

1.14	**Include Digital maps of the district for**	Location map of district with in State as Annexure I	Enclosed: **Yes**
		Mean annual rainfall as Annexure 2	Enclosed: **Yes**
		Soil map as Annexure 3	Enclosed: No

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation (No rainfed area)

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks (Specify month)*	NA				

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks (Specify month)	NA				

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks (Specify month)	NA				

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**

Delay by 8 weeks (Specify month)	NA

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	NA				

Condition			**Suggested Contingency measures**		
Mid season drought **(long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)**	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	NA				

Condition			**Suggested Contingency measures**		
Mid season drought **(long dry spell)**	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At reproductive stage	NA				

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi crop planning**	**Remarks on Implementation**
	NA				

2.1.2 Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed/ limited release of water in canals due to low rainfall	Upland Alluvial soils heavy textured, canal irrigated	Rice-wheat	No change	• 10-15% higher seed rate, • optimum plant spacing • Sprinkler irrigation, Planting on beds, planting with ridger seeder, Laser land leveling, • Conjunctive use of canal and ground waters. • Split application of fertilizer, Application of organic manures, Straw mulching, Limited ground water use, prefer life saving irrigation • Short duration cultivars, • Adoption of plant protection measures • Soaking of wheat seeds before sowing, seed treatment with biofertilizer , deep ploughing during *kharif* season • Shallow irrigation of 4-5 cm depth, weed free environment	Seeds from State, national seed and private seed agencies. The schemes of NREGS, RKRY, NFSM, NHM are in operation. Govt. subsidy on sprinkler, drip irrigation systems and laser leveler
		Sugarcane	No change	• Drip/Furrow irrigation in Sugarcane, paired row planting, optimum plant spacing, Planting on beds, straw mulching • Laser land leveling • Intercultural operation and earthing up, Limited ground water use, prefer life saving irrigation • Conjunctive use of brackish ground waters with canal waters • Short duration cultivars • Adoption of plant protection measures • Weed free environment	-do-

Condition			Suggested Contingency measures		
	Major Farming situation	**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	Upland Alluvial soils heavy textured, canal irrigated	Rice-wheat	No change	Follow measures given for Rice- wheat cropping system for Delayed/limited release of water in canals	Seeds from State, national seed and private seed agencies. The schemes of NREGS, RKRY, NFSM, NHM are in operation. Govt. subsidy on sprinkler, drip irrigation systems and laser leveler.
		Sugarcane	No change	Follow measures given for Sugarcane for Delayed/limited release of water in canals	-do-

Condition			Suggested Contingency measures		
	Major Farming situation	**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	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Upland Alluvial soils, tube well irrigated	Rice-wheat	Maize-wheat	Follow measures given for Rice- wheat cropping system for Delayed/limited release of water in canals	Seeds from State, national seed and private seed agencies. The schemes of NREGS, RKRY, NFSM, NHM are in operation.

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
					Govt. subsidy on sprinkler, drip irrigation systems and laser leveler
		Sugarcane	No change	Follow measures given for Sugarcane for Delayed/limited release of water in canals	Seeds from State, national seed and private seed agencies. The schemes of NREGS, RKRY, NFSM, NHM are in operation. Govt. subsidy on sprinkler, drip irrigation systems and laser leveler

2.2 Unusual rains (untimely, unseasonal etc)

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Rice		Drainage	Drainage	Shifting to dry place
Wheat	Planting on beds and drainage	-do-	-do-	-do-
Sugarcane	-do-	-do-	-do-	-do-
Vegetables	-do-	-do-	-do-	-do-
Rapeseed-mustard	Drainage, if depth of standing water is > 5-6 cm	Drainage	Drainage	Shifting to dry place
Horticulture				

All Crops	• No adverse effect • Removal of unwanted sprouts • Spray insecticides & pesticides to control the insect & pest • Drain out water excess water	• Drain out the excess water to avoid flower and fruit drop • To control the fruit drop apply foliar application of nutrients and growth regulators • Apply insecticide & pesticides to control the insect & pest and diseases on young developing fruits • Plough the field to increase the root aeration.	Harvest the fruit crops timely and send to the market immediately.	• Apply fungicide to avoid post harvest diseases. • Proper covering of the produce. • Proper grading and cleaning of fruits immediately after harvest. • Use the damaged fruits for processing • Use water proof packaging
Heavy rainfall with high speed winds in a short span				
Rice	Drain stagnant water	Drainage	Drainage	Shifting to dry place
Wheat	-do-	-do-	-do-	-do-
Sugarcane	-do-	-do-	-do-	-do-
Vegetables	-do-	-do-	-do-	-do-
Rapeseed-mustard	Drainage, if depth of standing water is > 5-6 cm	-do-	-do-	-do-
Horticulture				
All crops	Drain out excess water	• Drain out the excess water to avoid flower and fruit drop • To control the fruit drop apply foliar application of nutrients and growth regulators • Apply insecticide & pesticides to control the insect & pest and diseases on young developing fruits • Plough the field to increase the root aeration.	Harvest the fruit crops timely and send to the market immediately.	• Apply fungicide to avoid post harvest diseases. • Proper covering of the produce. • Proper grading and cleaning of fruits immediately after harvest. • Use the damaged fruits for processing • Use water proof packaging

Outbreak of pests and diseases due to unseasonal rains				
Rice	Bacterial leaf blight, blast disease and false smut increases due to rains Soak 10 kg of seed in 10 lt. water suspension of Emisan / Bavistin 10 gm +1 g Streptocycline for 24 hrs. before sowing. No recommendation at vegetative stage for BLB control	Follow recommended control measures		
Wheat	Yellow and brown rust of wheat become severe Powdery mildew intensity becomes low to moderate Karnal bunt increases Spray 600 – 800 gm Mancozeb 200 lt. of water/acre at the appearance of disease and repeat after 15-20 days For powdery mildew control spray 600-800 gm wettable sulphur/200 lt. of water/acre			
Sugarcane	Red rot becomes severe due to heavy rains Use disease free setts treated with Emisan containing 6% mercury (Hg) for 4-5 min. or hot steam treated disease free setts			
Horticulture				
Potato	Early and late blight of potato increases with rainfall viral disease decreases Spray Mancozeb @ 0.25% 4-5 times at an interval of 15 days			

2.3 Floods

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Rice	Drainage, if stagnant water	Drainage	Drainage	Shifting to dry place
Wheat	-do-	-do-	-do-	-do-
Sugarcane	-do-	-do-	-do-	-do-
Vegetables	-do-	-do-	-do-	-do-
Rapeseed-mustard	Drainage, if depth of standing water is > 5-6 cm	Drainage	Drainage	Shifting to dry place
Horticulture				
Crop1 (specify) Crop2 Crop3	• Drain out the flood water • Spray of nutrients/supplementation • Prefer plantation of water logging resistant crop like Jamun. • Mount planting of fruit trees			Drain out the flood water
Continuous submergence for more than 2 days				
Rice	No adverse effect on crop	No adverse effect on crop	No adverse effect on crop	Shifting the produce to dry place
Wheat	Drainage, if stagnant water	Drainage	Drainage	-do-
Sugarcane	-do-	-do-	-do-	-do-
Vegetables	-do-	-do-	-do-	-do-
Rapeseed-mustard	Drainage, if depth of standing water is > 5-6 cm	-do-	-do-	-do-
Horticulture				
Crop1 (specify) Crop2 Crop3	➢ Drain out the flood water ➢ Spray of nutrients/supplementation ➢ Prefer plantation of water logging resistant crop like Jamun. ➢ Mount planting of fruit trees			Drain out the flood water
Sea water inundation	NA			

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

Extreme event type	Suggested contingency measurer			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave				
Rice	Micro-irrigation, avoid irrigation during hot hours with poor quality waters	Micro-irrigation avoid irrigation during hot hours with poor quality waters		
Sugarcane	-do-	-do-	Micro-sprinkler irrigation Avoid irrigation during hot hours With poor quality waters	
Wheat				
Horticulture				
Mango				
Guava				
Crop3				
Cold wave				
Wheat	Irrigation and proper nutrition	Irrigation and proper nutrition	Irrigation and proper nutrition	
Rapeseed-mustard	-do-	-do-	-do-	
Horticulture				
Vegetables	Irrigation and proper nutrition	Irrigation and proper nutrition	Irrigation and proper nutrition	Vegetables
Frost				
Wheat	Irrigation and proper nutrition	Irrigation and proper nutrition	Irrigation and proper nutrition	
Vegetables	Irrigation and proper nutrition, covering the crop with straw or plastic sheet	Irrigation and proper nutrition, covering the crop with straw or plastic sheet	Irrigation and proper nutrition, covering the crop with straw or plastic sheet	
Rapeseed-mustard	Irrigation and proper nutrition	Irrigation and proper nutrition	Irrigation and proper nutrition	
Hailstorm				
Cyclone	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**
Drought			
Feed and fodder availability	• All Districts should be asked to locate their feed and fodder banks in view of submergence situation arising due to draught. Sufficient care must be taken to sensitize the farmers to protect their feed and fodder much ahead of onset of monsoon. The sources for procurement of feed / rice bran (Kunda) within the district and nearest locations should be identified, and the suppliers kept informed about the emergency situation, which might require action at their level for production and supply to the identified areas within the shortest possible time. • Complete feed blocks should be prepared and stored in the feed banks for scarcity periods. • The livestock holders of small ruminants should be educated/ informed to collect sufficient amount of green leaves from edible plants for use during the period of submergence at the earliest, after receipt of draught warning. The district authorities of Animal Husbandry Department should chalk out a complete programme to cater the feed & fodder needs of livestock. • Increase the sown area under fodder crops • Looking to scarcity of crop residues, burning of paddy straw and stubbles should not be allowed in Haryana. This can be properly harvested, baled, densified and fortified using 4% urea with molasses and transported to areas of	• The best option is to open fodder depots for milch animals which farmers will never deposit into the cattle camps and establish cattle camps for dry and scrub animals. These camps should be established along assured source of water or canals for drinking and growing fodder. • Facilities like storing densified roughages transported from other districts should also be established adjacent to these camps. • Complete feed blocks stored in the feed banks should be provided to productive, lactating and pregnant animals for scarcity periods • Since stall feeding adversely affects the breeding efficiency in case of sheep, therefore, sheep should always be resorted to natural grazing. • Special care is required for productive, lactating and pregnant animals. These animals must be supplemented with additional concentrates and fodders. • Most of such animals will be retained by the farmers and arrangements for fodder, feed and drinking water should be made accordingly.	• Immediate efforts are needed to grow fodder crops like oats, barley, *kasni* and *lucern* etc. in the canal command areas. • Farmers might have to be compensated for abandoning food or commercial cash crop to meet contingent fodder requirements.

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
	fodder scarcity. Standardized machinery for harvesting, bailing, densification and fortification is available with Punjab Agro Federation and in the market.		
Drinking water	Prior to the onset of summer all the water ponds/lakes in the villages/cities should be filled up with canal water/tube wells.	• All the affected livestock should have an access to clean drinking water. Arrangements are required to be made in this regard with the help of concerned Government functionaries of the Districts. • Resorting to alternate day watering to camel, sheep and goats. Experimental evidences show that even watering twice a week did not have much adverse effect on body weight of the sheep. • Avoiding long distance grazing, as tired animals need more and frequent watering and feeding.	Normal supply of water should be restored.
Health and disease management	Constitution of task force at district and sub division level which will formulate guidelines for action should have a mobile veterinary unit at their disposal. Procurement of mineral and feed supplements, life saving drugs, electrolytes, vaccines etc.	Disbursement of supplements, treatment of affected animals in camps, proper disposal of dead animals, deworming and vaccinations.	Rehabilitation of affected animals, provision of veterinary aid and follow up, provide supplements etc to make up losses for deficiencies.
Floods			
Feed and fodder availability	Follow the measures given for drought	Follow the measures given for drought	Follow the measures given for drought
Drinking water	Tube wells should be installed before monsoon to provide underground water to the livestock during flood period.	All the affected livestock and poultry should have an access to clean drinking water. Arrangements are required to be made in this regard with the help of concerned Government functionaries of the Districts. The available water may be chlorinated if required with help of Halogen Tablet prior to drinking by livestock and poultry.	Normal supply of water should be restored.
Health and disease management	Constitution of task force at district and sub division level which will formulate guidelines for action. Procurement of mineral and feed supplements, life saving drugs, electrolytes, vaccines etc. Workout places for evacuation.	Evacuate to safe places, provide veterinary aid to affected animals, proper disposal of dead animals, disainfection of drinking water. If not already done, carry out deworming and vaccinations for HS, FMD, BQ in cattle, PPR, sheep pox, ET in sheep	Rehabilitation of affected animals, provision of veterinary aid and follow up, provide supplements etc. Disinfection of area, control of vectors, prevention of spread of

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
		and goats, swine fever in pigs..	disease/outbreaks. Treatment of affected animals.
Cyclone	NA		
Heat wave and cold wave			
Shelter/environment management	Necessary arrangement of tatties, gunny bags and tirpal should be made available so as to cover the sheds during heat and cold waves	• Window of the sheds should be covered with gunny bags, tatties, and tirpal. Electric fans should be provided in the sheds and if possible desert cooler should be provided during heat period. • High energy and readily available sources of energy nutrients may be provided in the ration.	Normal shelter should be restored
Health and disease management	Provision of shelter/roof/covered and open area to animals, procurement of life saving drugs and vaccines.	Cold waves: Cover the animal with old blanket/gunny bag etc. Heat wave: Sprinkle water/take buffaloes to ponds. Treat affected animals, vaccinate if not done earlier.	Treatment of affected animals, provide veterinary aid and follow up.

2.5.2 Poultry

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	• All Districts should be asked to locate their feed banks in view of submergence situation arising due to draught. Sufficient care must be taken to sensitize the farmers to protect their feed and fodder much ahead of onset of monsoon. The sources for procurement of feed / rice bran (Kunda) within the district and nearest locations should be identified, and the suppliers kept informed about the emergency situation, which might require action at their level for production and supply to the identified areas within the shortest possible time. • The district authorities of Animal Husbandry Department should chalk out a complete programme	Poultry farmers should be provided with sufficient amount of feed ingredients and complete feed during draught situation from the feed banks.	Normal feeding should be restored

	to cater to feed the poultry birds.		
Drinking water	Necessary arrangement for water storage should be made. Hand pumps should be installed around the sheds. Sufficient quantity of electrolytes should be ensured.	All the affected poultry should have an access to clean drinking water. Arrangements are required to be made in this regard with the help of concerned Government functionaries of the Districts.	Normal drinking water restored
Health and disease management	Constitution of task force at district and sub division level which will formulate guidelines for action should have a mobile veterinary unit at their disposal. Commercial poultry farms can procure grain/feed in advance.	In backyard birds, put some grains and sufficient water inside the enclosure, provide some vitamin supplement.	In backyard poultry, carry out deworming and vaccination for Ranikhet disease and Gumboro. Provide vitamins and mineral supplement.
Floods			
Shortage of feed ingredients	Follow measures given for drought	Sufficient quantity of feeds stored in the feed banks should be made available to the poultry farmers.	Normal feeding should be restored
Drinking water	Prior to the onset of monsoon tube wells should be installed in the villages and near to the poultry farms so as to provide underground water during flood.	Follow measures given for Drought drinking water condition	Normal drinking water restored
Health and disease management	Constitution of task force at district and sub division level which will formulate guidelines for action should have a mobile veterinary unit at their disposal. Make provision of shelter for evacuation and arrangement around farm so that flood water does not enter poultry farm/shed. Provision or facilities for disposal of dead birds.	Evacuate the birds to safer places. Carry out deworming and vaccinations. May dispose off/sell birds for meat purpose. Proper disposal of dead birds.	Make the shed dry, sprinkle lime and spray insecticides and disinfectant before placement of birds, use of coccidiostat in feed or water, and proper disposal of dead birds.
Cyclone	-NA-		
Heat wave and cold wave			
Shelter/environment management	Necessary arrangement of tatties, gunny bags and tirpal should be made available so as to cover the sheds during heat and cold waves	• Window of the sheds should be covered with gunny bags, tatties, and tirpal. Electric fans should be provided in the sheds and if possible desert cooler should be provided during heat period. • High energy and readily available sources of energy nutrients may be provided in the ration.	Normal shelter should be restored
Health and disease			

management			

2.5.3 Fisheries

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
A. Capture	NA		
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Further increase the depth of ponds, store the fish stock in 1 & 2 ponds only.	Sell the big fishes and keep the smaller fishes in one tank.	Stock the young fishes in different tanks, species wise.
(ii) Impact of salt load build up in ponds / change in water quality	Continuously add some water from tube well/water source in fish ponds	Do not allow the water level to go below 3.5 feet in fish ponds.	Stock the young fishes in different tanks and keep the water between 3.5 and 6.0 feet.
2) Floods			
A. Capture	NA		
B. Aquaculture			
(i) Inundation with flood water	Boundaries/Bundhs with height >6 feet may be made around fish ponds, will restrict, escape of fishes from ponds	Netout and stock the fishes in one big tanks and make the bundh >6 feet height around the ponds.	Remove the bundh separately and release the fishes, species-wise in tanks.
(ii) Water contamination and changes in water quality	Add more fresh water in each tank (tube well/canal), grow aquatic weeds.	Repeatedly filter and recirculate water from stocking tanks	Filter, recirculate and add new fresh water every week, will decrease fish mortality.
(iii) Health and diseases	Treat the pond water with $KmNO_4$ @ 10 ppm in each fish tanks. Add new fresh water periodically.	Disinfect fish ponds with $KmNO_4$ @ 10g/10,000 liter water fortnightly.	Treatment with $KmNO_4$ must continue for one month even after flood situation is out. Remove the highly infected fishes from ponds.
(iv) Loss of stock and inputs (feed, chemicals etc)	Store the inputs at safer places.	Move stock and inputs to safer places and acquire fresh stock in shortage.	Retain the normal arrangements.

(v) Infrastructure damage (pumps, aerators, huts etc)	Make alternate arrangements according to the anticipated conditions	Proper maintenance/repairing of damaged infrastructure or make new arrangements.	Proper maintenance/repairing of damaged infrastructure.
(vi) Any other			
3. Cyclone / Tsunami	NA		
4. Heat wave and cold wave			
A. Capture	NA		
B. Aquaculture			
(i) Changes in pond environment (water quality)	Keep the ponds water fresh by adding fresh tubewell water, regularly.	Showering the water in air and add fresh tube-well water, periodically.	During heat waves, showering is must and also tubewell water. In winter continue adding of tubewell water with $KmNO_4$.
(ii) Health and Disease management	Treatment of KmNO4 @ 10 ppm. Sale out the bigger fishes.	Treatment of KmNO4 @ 10 ppm. Dump the fishes which were heavily infected	Disinfection with $KmNO_4$ continues. Sale out all the fishes except, infected ones. Dump the infected fishes in a ditch in the ground.
(iii) Any other	-	-	-

Annexure 1

Location map of district in the state of Haryana

Mean Annual rainfall