

**State: Bihar**  
**Agriculture contingency Plan for the District: Purnea**

Krishi Vigyan Kendra, Purnea (Jalalgarh)  
 Bihar Agricultural University, Sabour, Bhagalpur

1.0	<b>District Agriculture Profile</b>		
1.1	Agro-Climatic Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Eastern Plain, Hot Subhumid (moist) Eco-sub region (13.1)	
	Agro-Climatic Zone (Planning Commission)	Middle Gangetic Plain Region (IV)	
	Agro Climatic Zone (NARP)	North East Alluvial Plain Zone (BI-2)	
	List all the districts falling under the NARP Zone*(*>50% area falling in the zone)	Begusarai, Saharsa, Supaul, Madhepura, Purnea , Kishanganj, Araria, Katihar	
	Geographical location of the district	Latitude	Longitude
		25°13'N and 25°54' N	87°12'E and 88°5'E
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Altitude	
		32.66 m above msl	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	R.R.S.S Agwanpur	
	Mention the KVK located in the district	KVK, Purnea	
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	-	

1.2	<b>Rainfall</b>	<b>Average (mm)</b>	<b>Normal onset</b>	<b>Normal cessation</b>
	SW Monsoon (June-September)	313.83	3 <sup>rd</sup> Week of June	1 <sup>st</sup> week of September
	NE- monsoon (Oct.-Dec.)	119.60	-	-
	Winter (January –March)	9.56	-	-
	Summer (April-May)	38.13	-	-
	Annual	1314.6	-	-

1.3	<b>Land use pattern of the district (Latest Statistics )</b>	<b>Geographical area</b>	<b>Forest area</b>	<b>Land under non agricultural use</b>	<b>Permanent pastures</b>	<b>Cultivable wasteland</b>	<b>Land under mis crops and grasses</b>	<b>Barren and uncultivable land</b>
	Area (ha)	320231	116	45856	454	12725	8939	36164

Source: Com. Dist. Agri. Plan 2008

<b>1.4</b>	<b>Major soils</b>	<b>Area (000 ha)</b>	<b>Percent (% of total )</b>	
	Sandy loam soils	-	21.66	
	Loam soils	-	40.76	
	Clay loam soils	-	21.74	
	Other soils		15.87	
<b>1.5</b>	<b>Agricultural land use</b>	<b>Area (000 ha)</b>	<b>Cropping intensity %</b>	
	Net sown area	215235	132	
	Area sown more than once	94.680	-	
	Net irrigated area	60181.2	-	
	Gross cropped area	284067	-	
<b>1.6</b>	<b>Irrigation</b>	<b>Area (000 ha)</b>	<b>Percent (%)</b>	
	Net cultivated area			
	Net irrigated area			
	Gross cultivated area			
	Gross irrigated area			
	Rainfed area	-	-	
	<b>Source of irrigation</b>	<b>Number</b>	<b>Area</b>	<b>% area</b>
	Canals		59492.47	
	Tanks			
	Open wells		1119.39	
	Bore wells			
	Lift irrigation			-
	Other sources		19959.72	-
	Total			-
	Pump sets		-	-
	Micro irrigation		-	
	<b>Ground water availability and use</b>	<b>No. of blocks</b>	<b>% area</b>	<b>quality of water</b>
	Over exploited			
	Critical			
	Semi critical			
	Safe			
	Waste water availability and use			

Over exploited ground water utilization > 100% Critical 90-100% Semi critical 70-90% safe < 70%

#### 1.7 Area under major field crops & horticulture etc

<b>1.7</b>	<b>Horticulture crops – fruits</b>	<b>Total area (ha)</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Fruits (Total)	3022	-	-
	<b>Horticultural crops-Vegetables</b>	<b>Total area</b>	<b>Irrigated</b>	<b>Rainfed</b>



	Tomato	-	-	-	-	-	-	-	125
	Onion	-	-	-	-	-	-	-	500
	Brinjal	-	-	-	-	-	-	-	2332

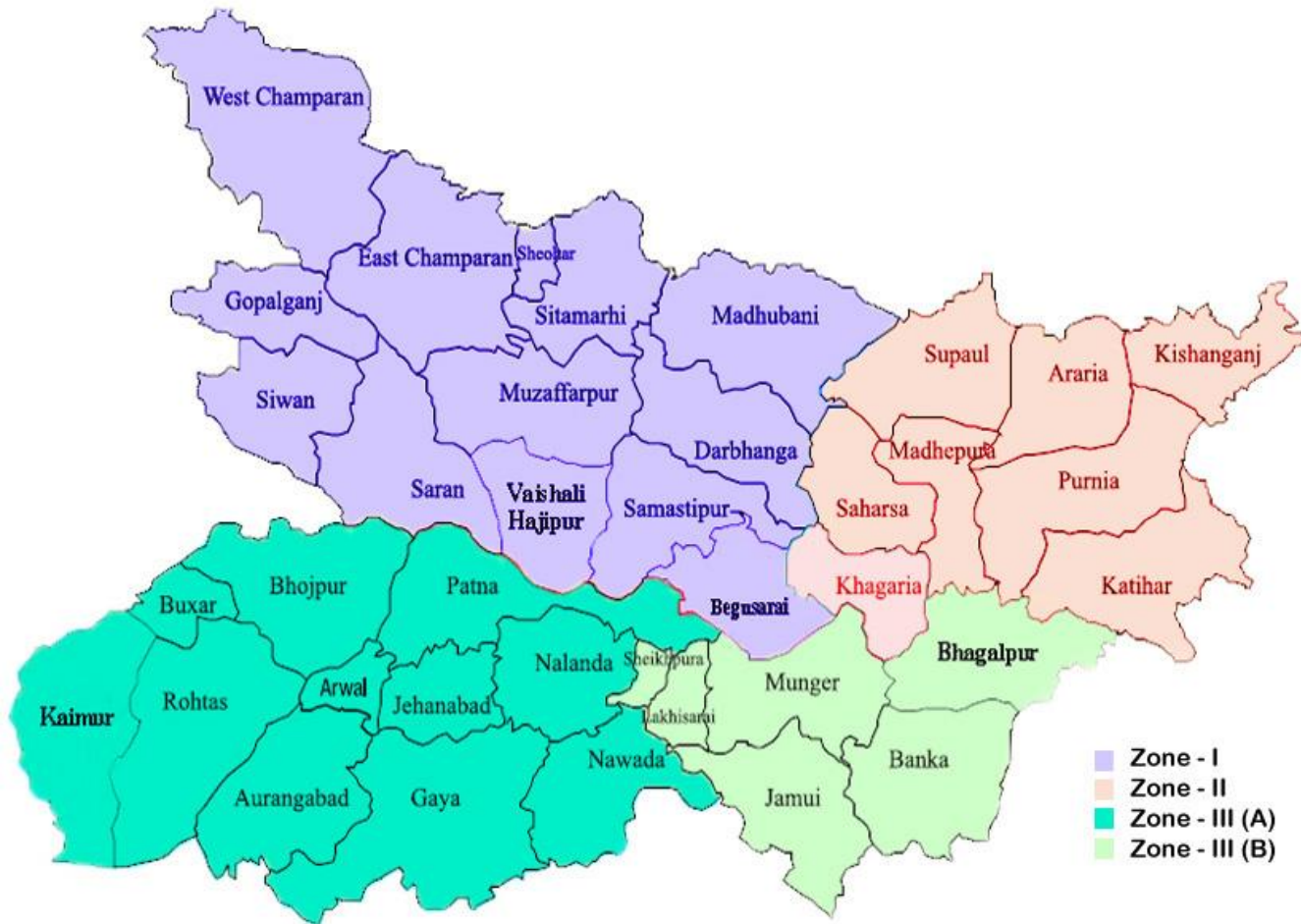
1.12	Sowing window for 5 major crops (Start and end of sowing period)	Rice	Wheat	Boro-Paddy	Pulses	Maize
	Kharif Rainfed	May-June	-		June	May-June
	Kharif Irrigated	May-June	-	-	July-August	May-June
	Rabi Rainfed	-	1 <sup>st</sup> -2 <sup>nd</sup> week of November	October- December	October November	-
	Rabi Irrigated	-	2 <sup>nd</sup> week of November-1 <sup>st</sup> week of January	2 <sup>nd</sup> week of October.-2 <sup>nd</sup> week of December	November-December	October.-November

1.13	What is the major contingency the district is prone to?	Regular	Occasional	None
	Drought		√ (June)	
	Flood	√		
	Cyclone			√
	Heat storm			√
	Heat wave	√		
	Cold wave	√		
	Frost	√		
	Sea water inundation			√
	Pests and diseases (specify)	√		

1.14	Include digital maps of the district for	Location map of district within state as Annexure-1	Enclosed: Yes
		Mean annual rainfall as annexure	Enclosed: Yes
		Soil map as Annexure	Enclosed: Yes

### Annexure I

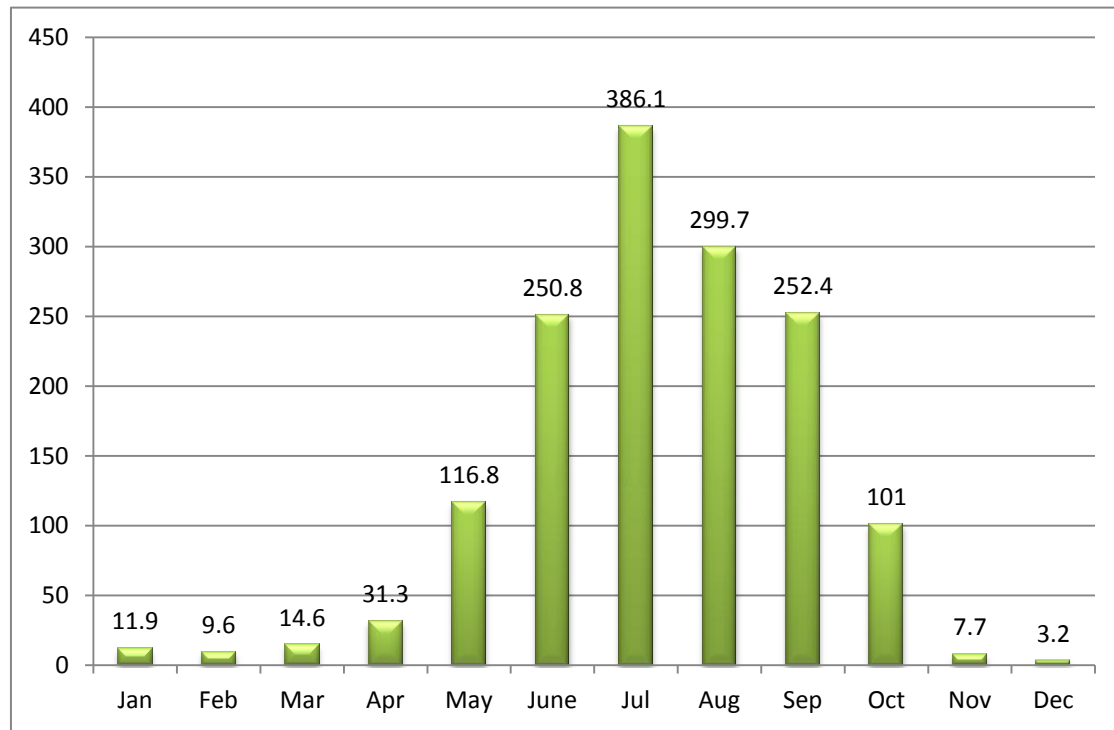
#### Agro climatic Zones of Bihar



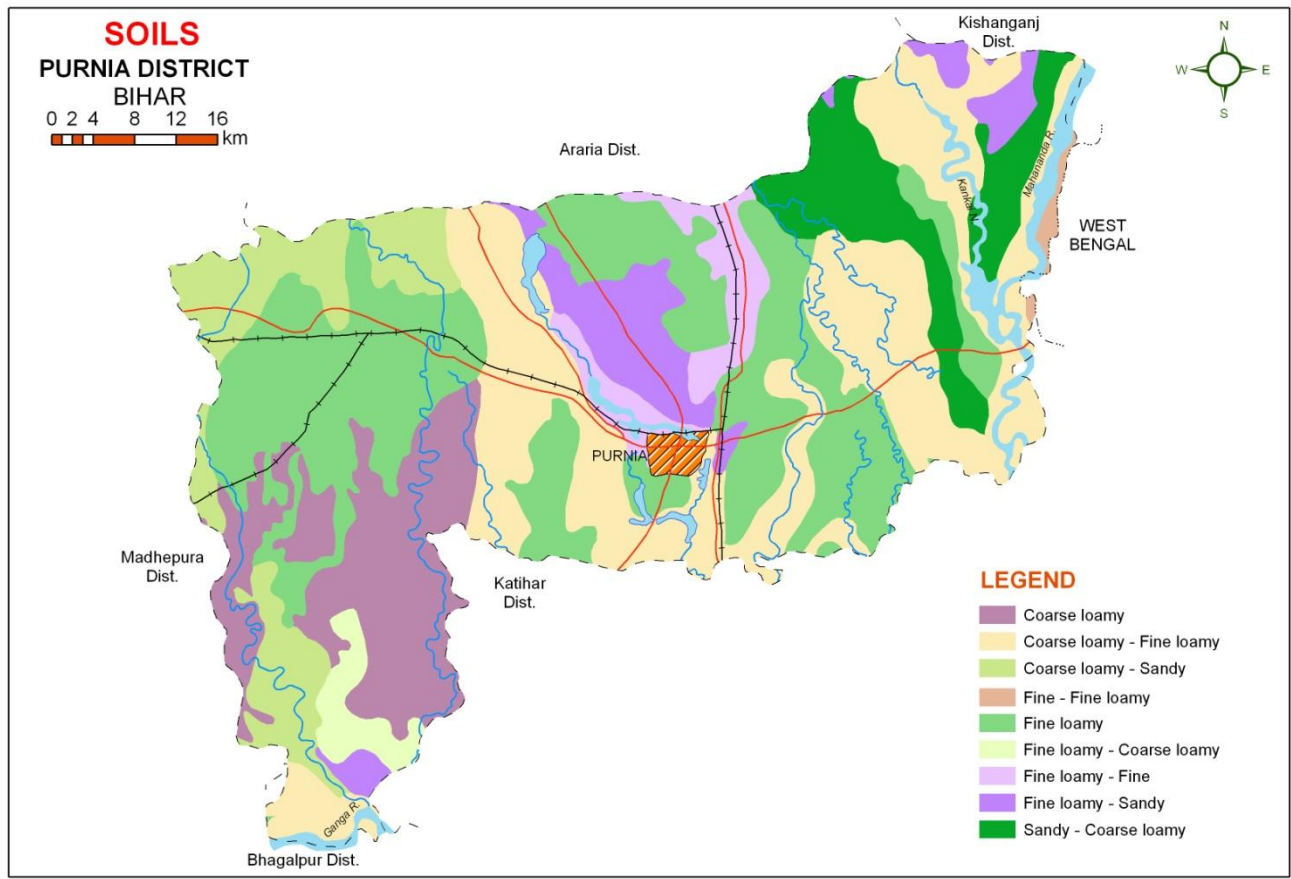
Source: [krishi.bih.nic.in](http://krishi.bih.nic.in)

### Annexure II

Mean annual rainfall (mm)



**Annexure III**



Source : NBSS& LUP, Regional Centre, Kolkata

**2.0 Strategies for weather related contingencies**

**2.1 Drought**

**2.1.1 Rainfed situation**

Condition			Suggested contingency measures.		
Early season drought (delayed onset)	Major Farming situation	Crop/ cropping system	Change in crop/cropping system	Agronomic moistures	Remarks on Implementation
Delay by 2 weeks 1 <sup>st</sup> week of July	Upland	Maize-wheat-Green gram(Local) Sesame-Lentil-Green gram(Local) Maize-Maize/Potato	No Change	Normal package of practices	Seeds from BAU, Sabour, NSC,TDC, BRBN etc.
	Medium land	Rice-wheat-Green gram Rice-Lentil/ Rice-Maize  Jute-Potato	Rice- Prefer Long to medium duration varieties Rice - Rajendra sweta (135-140d), Rajendra mahsuri (140-150 days), Sita (130140d), Rajendra Bhagawati, Rajendra Suwasni, Rajshree (140d)	<ul style="list-style-type: none"> <li>• Adopt normal package of practices</li> <li>• Use 3-4 seedling per hill</li> <li>• Raise staggered community nursery preferably with medium duration varieties in mid lands</li> <li>• Dapog Nursery</li> <li>• Adopt SRI technology</li> <li>• Interculture for timely weed control</li> </ul>	
	Lowland	( <b>Shallow Lowland</b> ) Rice-PairaLentil Rice-Late Wheat-Green gram(Local) ( <b>Deep Lowland</b> )  Rice-Boro Rice	Rice- Prefer Long duration varieties,Rajshree, ,BPT5204,Suwarna sub-1;Satyam, Kishori  Rice- Sudha, Vaidehi	Normal package of practices	





Condition			Suggested contingency measures.		
Early season drought (delayed onset)	Major Farming situation	Crop/ cropping system	Change in crop/cropping system	Agronomic moistures	Remarks on Implementation
		Lowland) Rice-Boro Rice	water Rice.	Transplanted/ Direct sowing with brown manuring.	

Condition			Suggested contingency measures.		
Early season drought (delayed onset)	Major Farming situation	Crop/ cropping system	Change in crop/cropping system	Agronomic moistures	Remarks on Implementation
Delay by 6 weeks 1 <sup>st</sup> week of August	Upland	Maize-wheat- Green gram(Local) Sesame-Lentil- Green gram(Local) Maize- Maize/Potato	Short Duration maize- Shaktiman 1 to5. Sesame-Krishana	<ul style="list-style-type: none"> <li>Life saving irrigation</li> </ul>	Seeds from BAU, Sabour, NSC,TDC, BRBN etc
	Medium land	Rice-wheat- Green gram(Local) Rice-Lentil/Potato Rice-Maize  Jute-EarlyPotato	Toria – wheat- Green gram(Local)  Sesame-Lentil-Green gram(Local) Maize-Maize/Potato  Jute-Mustard- Green gram(Local)	<ul style="list-style-type: none"> <li>Mat nursery (dapog method)/ Community nursery can be raised for quick availability of young seedlings for transplanting of medium duration varieties by first fortnight of August</li> <li>Direct seedling of Rice</li> <li>Raise staggered community nursery preferably with medium duration varieties in mid and lowlands</li> </ul>	
	Lowland	( <b>Shallow Lowland</b> ) Rice-PairaLentil Rice-Late Wheat- Green gram(Local) ( <b>Deep Lowland</b> )  Rice-Boro Rice	Medium duration Rice – PairaLentil	<ul style="list-style-type: none"> <li>Enhanced basal dose of NPK to boost the early vegetative growth</li> <li>Life saving irrigation</li> </ul>	

Condition			Suggested contingency measures.		
Early season drought (delayed onset)	Major Farming situation *	Crop/ cropping system*	Change in crop/cropping system*	Agronomic moistures *	Remarks on Implementation*
Delay by 8 weeks  3 <sup>rd</sup> week of August	Upland	Maize-wheat- Green gram(Local) Sesame-Lentil- Green gram(Local) Maize- Maize/Potato	Toria- wheat- Green gram(Local) Mustard/Toria-Wheat	<ul style="list-style-type: none"> <li>• Inter culture.</li> <li>• Life saving irrigation.</li> </ul>	Seeds from BAU, Sabour, NSC,TDC, BRBN etc
	Medium land	Rice-wheat- Green gram(Local) Rice-Lentil/Potato Rice-Maize  Jute-EarlyPotato	Toria- wheat- Green gram(Local) Mustard/Toria-Wheat	<ul style="list-style-type: none"> <li>• Fodder varieties of Jowar, Maize, Bajra in combination with legumes (cowpea and horsegram) can be taken up wherever feasible to meet the fodder requirements in deficit rainfall districts</li> </ul>	
	Lowland	( <b>Shallow Lowland</b> ) Rice-PairaLentil Rice-Late Wheat- Green gram(Local) ( <b>Deep Lowland</b> )  Rice-Boro Rice	<u>Euryale ferox salberis</u> ( Makhana)  <u>Euryale ferox salberis</u> ( Makhana)	<ul style="list-style-type: none"> <li>• Vegetables can be taken up on time for maximizing productivity from lowlands in early kharif.</li> <li>•</li> </ul>	

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	Upland	Maize-wheat- Green gram(Local) Sesame-Lentil-Green gram(Local)	<ul style="list-style-type: none"> <li>• Gap filling</li> <li>• Life saving irrigation</li> </ul>	Foliar spray of Potash.	

sowing leading to poor germination/crop stand etc.		Maize-Maize/Potato			
	Medium land	Rice-wheat- Green gram Rice-Lentil/ Rice-Maize  Jute-Potato	*Life saving irrigation * Gap filling	Foliar spray of Potash.	
	Lowland	<u>Euryale ferox salberis</u> ( Makhana)		Normal package of practices.	

Condition			Suggested contingency measures.		
Mid season drought (long dry spell consecutive 2 weeks rainless (>25 mm))	Major Farming situation	Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At vegetative stage	Upland	Maize-wheat- Green gram(Local) Sesame- Lentil-Green gram(Local) Maize- Maize/Potato	Postpon top dressing Life saving irrigation	**Mulching *conservation tillage	
	Medium land	Rice-wheat- Green gram Rice-Lentil/ Rice-Maize  Jute-Potato	*Postpone top dressing Life saving irrigation	*Mulching *conservation tillage	
	Lowland ( Shallow)	<u>Euryale ferox salberis</u> ( Makhana)	*Life saving irrigation	-	
	( Deep)	<u>Euryale ferox salberis</u>			

		( Makhana)		
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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	Upland	Maize-wheat-Green gram(Local) Sesame-Lentil-Green gram(Local) Maize-Maize/Potato	*Life saving irrigation	* Weed Mulching Foliar application with 2% MOP *Life saving irrigation	
	Medium land	Rice-wheat-Green gram Rice-Lentil/ Rice-Maize  Jute-Potato	*Life saving irrigation	*Weed Mulching *Life saving irrigation	

Condition			Suggested contingency measures.		
Terminal drought	Major Farming situation *	Crop/ cropping system*	Crop management*	Soil nutrient & moisture conservation measures*	Remarks on Implementation*
	Upland	Paddy - Wheat		<ul style="list-style-type: none"> <li>Open the furrow during evening and left furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like wheat, Rabi Maize/Pulses /Oilseeds/ Vegetables</li> </ul>	
	Medium land	Paddy - Wheat			
	Lowland	Paddy - Wheat			

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	Rice - Wheat	Short duration Rice – Late variety Wheat	*Direct seeding Rice *Dapog Nursery * Adopt SRI technology * Use of Zero Tillage Machine for paddy sowing + Dhaincha	
	Medium land	Rice - Wheat	Short duration Rice – Late variety Wheat	*Direct seeding Rice *Dapog Nursery * Adopt SRI technology * Use of Zero Tillage Machine for paddy sowing + Dhaincha	
	Lowland	Rice - Wheat	Short duration Rice – Late variety Wheat	*Direct seeding Rice *Dapog Nursery * Adopt SRI technology * Use of Zero Tillage Machine for paddy sowing + Dhaincha	

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 catchments	Upland	Rice - Wheat	Short duration Rice – Late variety Wheat	*Direct seeding Rice *Dapog Nursery * Adopt SRI technology * Use of Zero Tillage Machine for paddy sowing + Dhaincha *Use Short duration variety of Paddy	
	Medium land	Rice - Wheat	Short duration Rice – Late variety Wheat	*Direct seeding Rice *Dapog Nursery * Adopt SRI technology * Use of Zero Tillage Machine for paddy sowing + Dhaincha	
	Lowland	Rice - Wheat	Short duration Rice – Late variety Wheat	*Direct seeding Rice *Dapog Nursery * Adopt SRI technology * Use of Zero Tillage Machine	

				for paddy sowing + Dhaincha	
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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	Upland	Paddy - Wheat	Short duration Rice – Late variety Wheat	* Mulching Life saving irrigation	
	Medium land	Paddy - Wheat	Short duration Rice – Late variety Wheat		
		Paddy - Wheat	Short duration Rice – Late variety Wheat		

Condition			Suggested contingency measures.			
	Major Farming situation *	Crop/ cropping system*	Change in crop/cropping system*	Agronomic measures*	Remarks on Implementation*	
Insufficient ground water recharge due to low rainfall	Upland	Paddy – Wheat- Maize	Short duration Rice – Late variety Wheat	* Mulching		
		Paddy - lentil - Maize	Short duration Rice – Lentil			
	Medium land	Paddy – Wheat- Maize	Short duration Rice – Late variety Wheat			
		Paddy - lentil	Short duration Rice – Lentil			
	Lowland	Paddy – Wheat-Boro- Paddy	Short duration Rice – Late variety Wheat			* Mulching
		Paddy – lentil- Boro Paddy	Short duration Rice – lentil			* Mulching
Any other condition (specify)		Vegetable				

## 2.2 Unusual rains (untimely, un-seasonal etc ) (for both rainfed and Irrigated Situation)

Condition	Suggested contingency measure			
High rainfall in a short span	Vegetative Stage	Flowering Stage	Crop Maturity Stage	Post Harvest

Condition	Suggested contingency measure			
leading to water logging				
Rice	Re-plantation, Gap filling	Provide drainage	Drenching	Storage properly
Wheat, Maize, Gram, Lentil	Re-sowing	Provide drainage		
Boro-paddy	Re-plantation, Gap filling	-	Drenching	Storage properly
<b>Horticulture</b>	<b>Vegetative Stage</b>	<b>Flowering Stage</b>	<b>Crop Maturity Stage</b>	<b>Post Harvest</b>
Mango	Re-plantation	Provide drainage	Provide drainage	Storage properly
Banana	Re-plantation	Provide drainage	Provide drainage	Storage properly
Guava	Re-plantation	Provide drainage	Provide drainage	Storage properly
Lemon	Re-plantation	Provide drainage	Provide drainage	Storage properly
Coconut	Re-plantation	Provide drainage	Provide drainage	Storage properly
<b>Heavy rainfall with high speed winds is in short span</b>	<b>Vegetative Stage</b>	<b>Flowering Stage</b>	<b>Crop Maturity Stage</b>	<b>Post Harvest</b>
Rice	Re-plantation, Gap filling	-	Drenching	Storage properly
Wheat	Re-sowing	Provide drainage	Provide drainage	Storage properly
Maize	Re-sowing	Provide drainage	Provide drainage	Storage properly
Gram	Re-sowing	Provide drainage	Provide drainage	Storage properly
Lentil	Re-sowing	Provide drainage	Provide drainage	Storage properly
<b>Horticulture</b>	<b>Vegetative Stage</b>	<b>Flowering Stage</b>	<b>Crop Maturity Stage</b>	<b>Post Harvest</b>
Mango	Re-plantation & Staking	Drainage of water properly	Drainage of water properly & Staking	Storage properly
Banana	Re-plantation & Staking	Drainage of water properly	Drainage of water properly & Staking	Storage properly
Guava	Re-plantation & Staking	Drainage of water properly	Drainage of water properly & Staking	Storage properly
Lemon	Re-plantation & Staking	Drainage of water properly	Drainage of water properly & Staking	Storage properly
Coconut	Re-plantation & Staking	Drainage of water properly	Drainage of water properly & Staking	Storage properly
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Rice	<ul style="list-style-type: none"> <li>❖ For Plant Hopper, Leaf Hopper management spray Imidacloprid 0.01%</li> <li>❖ Seedling treatment with granular insecticide – Cartap hydrochloride</li> <li>❖ or phorate 10G or carbofuran 3G.</li> <li>❖ Maintain shallow water in</li> </ul>	<ul style="list-style-type: none"> <li>❖ For Rice gundhi Bug, dusting carbofuran 3G @ 1kg ai./ha</li> <li>❖ Use copper fungicides against Bacterial leaf blight.</li> <li>❖ Split application of</li> </ul>	<ul style="list-style-type: none"> <li>❖ Harvest at physiological maturity</li> </ul>	Rice weevil infestation can be managed by proper drying and safe storage



Condition	Suggested contingency measure			
	nursery beds ❖ Providing good drainage.	N fertilizer (3-4 times)		
Maize	❖ Stem borer can be managed by applying carbofuran 3G @ 25 kg/ha ❖ Drainage, and yellowing mainly due to nitrogen deficiency apply N split doses ❖ Application of granular insecticides viz. Thimet 10g, or Carbofuran 3g. in whorl of maize	Climbing cutworm can be managed by spraying Imidacloprid 0.01% ❖ Foliar blight control through Mancozeb @ 2.5g/l or Zineb/ Maneb @ 2.5-4 g/lit of water (2-4 applications at 8-10 days interval)	❖ Cob harvesting from standing crop ❖ Harvest at physiological maturity	❖ Ensure 10-12% moisture in grains before storage to prevent further infestation of store grain pest ❖ Storage in safe places like farmer warehouse/tent covering of produce ❖ Proper drying
<b>Horticulture</b>				
Mango	<b>Mango Leaf hopper</b> Spraying Malathion 1litre per ha / Imidacloprid @ 0.01% <b>Anthracnose:-</b> The foliar infection can be controlled by spraying of copper oxychloride (0.3%)  Use bio control agent viz <i>Streptosporangium pseudovulgare</i>  <b>Bacterial canker:</b> Regular inspection of orchards, sanitation and seedling certification are recommended as preventive measures. Mango stones for raising seedlings (root stock) should always be taken from healthy fruits.	<b>Mealy bug</b> Spraying Malathion 1litre per ha / Imidacloprid @ 0.01% <b>Anthracnose:-</b> Apply Carbendazim/ Thiophanate methyl (1g/lit) to control of Anthracnose. Blossom infection can be controlled effectively by spraying of Bavistin (0.1%) at 15 days interval.  <b>Mango powdery mildew:</b> Spray wettable sulphur(0.2%) & calixin or karathane (0.1% ) during second week of December	<b>Fruit fly</b> Spraying Malathion 1litre per ha <b>Mango powdery mildew:</b> Prune diseased leaves and malformed panicles harbouring the pathogen to reduce primary inoculum load.  Spray wettable sulphur (0.2%) when panicles are 3-4" in size  Spray dinocap (0.1%) 15-20 days after first spray. Spray tridemorph (0.1%) 15-20 days after second spray.  Spraying at full bloom	Harvest at proper maturity  <b>Anthracnose:-</b>  Pre-harvest sprays of hexaconazole (0.01%) or Carbendazim (0.1%) at 15 days interval should be done in such a way that the last spray falls 15 days prior to harvest.  Diseased leaves, twigs, and fruits, should be collected and burnt to avoid the spread for next

Condition	Suggested contingency measure			
	Use of wind-breaks helps in reducing brushing/ wounding and thus reduces the chance of infection.		needs to be avoided. <b>Mango bacterial canker:</b> Three sprays of Streptocycline (200 ppm) at 10 days intervals reduce fruit infection.  In severe infection, spraying of Streptocycline (300 ppm) or copper oxychloride (0.3%) is more effective.	season

### 2.3 Floods

Condition	Suggested contingency measure			
	Seeding/ nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Transient water logging partial inundation</b>				
Rice				
Wheat	Proper drainage system, Re-sowing	-	-	Stop irrigation
Maize		Apply sub-surface drainage system	Apply sub-surface drainage system	Stop irrigation
Gram		Raised bed system	Reduce irrigation interval	Proper drainage , stop irrigation
Lentil		Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
<b>Horticulture</b>				
Mango	Proper drainage , stop irrigation	Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
Guava	Proper drainage , stop irrigation	Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
Banana	Proper drainage , stop irrigation	Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
Lemon	Proper drainage , stop irrigation	Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
<b>Continuous submergence for more than 2 days</b>				
Rice	Proper drainage system , stop	Sub-surface drainage system	Proper drainage ,	Proper drainage ,

Condition	Suggested contingency measure			
	Seeding/ nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Transient water logging partial inundation</b>	irrigation & Replanting		stop irrigation	stop irrigation
Wheat	Proper drainage system , stop irrigation & Replanting	Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
Maize	Proper drainage system , stop irrigation & Replanting	Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
Gram	Proper drainage system , stop irrigation & Replanting	Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
Lentil				
<b>Horticulture</b>				
Mango	Proper drainage system , stop irrigation	Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
Guava	Proper drainage system , stop irrigation	Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
Banana	Proper drainage system , stop irrigation	Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
Lemon	Proper drainage system , stop irrigation	Sub-surface drainage system	Proper drainage , stop irrigation	Proper drainage , stop irrigation
<b>Sea-water inundation</b>	Not applicable			

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

Extreme events type	Suggested contingency measure			
	Seedling/nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Heat Wave</b>				
Rice	Light irrigation	Light irrigation	Light irrigation	-
Wheat	Light irrigation	Light irrigation	Light irrigation	-
Maize	Light irrigation	Light irrigation	Light irrigation	-
Gram	Light irrigation	Light irrigation	Light irrigation	-
Lentil	Light irrigation	Light irrigation	Light irrigation	-
<b>Horticulture</b>				-
Mango, Guava, Banana, Lemon	Drip irrigation, Light irrigation			
<b>Cold Wave*</b>				

Extreme events type	Suggested contingency measure			
	Seedling/nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Horticulture</b>				
Mango, Guava, Banana, Lemon	Provide light irrigation, Mulching Create smoke to generate heat in orchards	Provide light irrigation, Mulching Create smoke to generate heat in orchards	Provide light irrigation, Mulching Create smoke to generate heat in orchards	-

## 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	Emergency stock maintaining	Use of emergency stock	Give light and nutritive feed
Drinking water	Use clean water , Stocking + Bleaching powder	Use clean water	Use clean water
Health & Disease management	Vaccination	Treatment if required	Proper care of animals health
<b>Floods</b>			
Feed and fodder availability	Emergency stock maintaining	Use of emergency stock	Give light and nutritive feed
Drinking water	-	Use of bleaching powder	Use clean water
Health & Disease management	Vaccination	Treatment if required	Proper care of animals health
<b>Cyclone</b>			
Feed and fodder availability	-	Kept in house	Give light and nutritive feed
Drinking water	-	Use clean water	Use clean water
Health & Disease management	-	Vaccination	Proper care of animals health
<b>Heat wave and cold wave</b>			
Storage of feed ingredients	Storage of Dry feed & fodder	Use of stored feed	Give light and nutritive feed
Health & Disease management	Vaccination	Treatment if required	Proper care of animals health

### 2.5.2 Poultry

	Suggested contingency measures		
	Before the event	During the event	After the event
<b>Drought</b>			
Storage of feed ingredients	Emergency stock maintenance	Use of emergency stock	Give light and nutritive feed
Drinking water	Emergency stock	Use of stock	Use clean water
Health & Disease management	Vaccination	Treatment if required	Proper care of animals health
<b>Floods</b>			
Storage of feed ingredients	Emergency stock maintained	Use of emergency stock	Give light and nutritive feed

Drinking water	Emergency stock	Use bleaching powder & medicines	Use clean water
Health & Disease management	Vaccination	Treatment if required	Proper care of animals health
<b>Cyclone</b>			
Storage of feed ingredients	Emergency stock maintained	Use of emergency stock	Give light and nutritive feed
Drinking water	-	-	Use clean water
Health & Disease management	Vaccination	Treatment if required	Proper care of animals health
<b>Heat wave and cold wave</b>			
Storage of feed ingredients	Emergency stock maintained	Use of emergency stock	-
Health & Disease management	-	Treatment if required	-

### 2.5.3 Fisheries

	Suggested contingency measures		
	Before the event	During the event	After the event
<b>Drought</b>			
Storage water in ponds due to insufficient rain/inflows	Alignment of water in pond (arrangement)	Alignment of water in pond	Give light and nutritive feed
Impact of heat & cold load build up in ponds / change in water quantity	Shady trees to be implanted	Over population in the pond fish specially in upper layer	Proper care of animals health
<b>Floods</b>			
Inundation with flood water	Uplifting of border of ponds	Use of Net for stopping flow of fish	Give light and nutritive feed
Water contamination and changes in BCO	Use of Bleaching powder	Use of bleaching powder	Proper care of animals health
<b>Cyclone</b>			
Overflow/flooding of ponds	Uplifting border of ponds	-	Give light and nutritive feed
Change in fresh briniest water ratio	-	-	Use clean water
Health & Disease management	Covering of poultry house, plantation of trees	Use of medicines if required	Proper care of animals health
<b>Heat wave and cold wave</b>			
Management of pond environment	Plantation of trees around pond	-	Give light and nutritive feed
Health & Disease management	-Do-	Use of medicines if required	Proper care of animals health

\* based on for warning wherever available