

State: Bihar
Agriculture contingency Plan for the District: Purnea

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 Bihar Agricultural University, Sabour, Bhagalpur

| | | | |
|-----|--|---|--------------------|
| 1.0 | District Agriculture Profile | | |
| 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 | Rainfall | Average (mm) | Normal onset | Normal cessation |
| | SW Monsoon (June-September) | 313.83 | 3 rd Week of June | 1 st week of September |
| | NE- monsoon (Oct.-Dec.) | 119.60 | - | - |
| | Winter (January –March) | 9.56 | - | - |
| | Summer (April-May) | 38.13 | - | - |
| | Annual | 1314.6 | - | - |

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

Source: Com. Dist. Agri. Plan 2008

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

| | | | | |
|------------|---------------------------------------|------------------------|------------------|----------------|
| 1.7 | Horticulture crops – fruits | Total area (ha) | Irrigated | Rainfed |
| | Fruits (Total) | 3022 | - | - |
| | Horticultural crops-Vegetables | Total area | Irrigated | Rainfed |

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

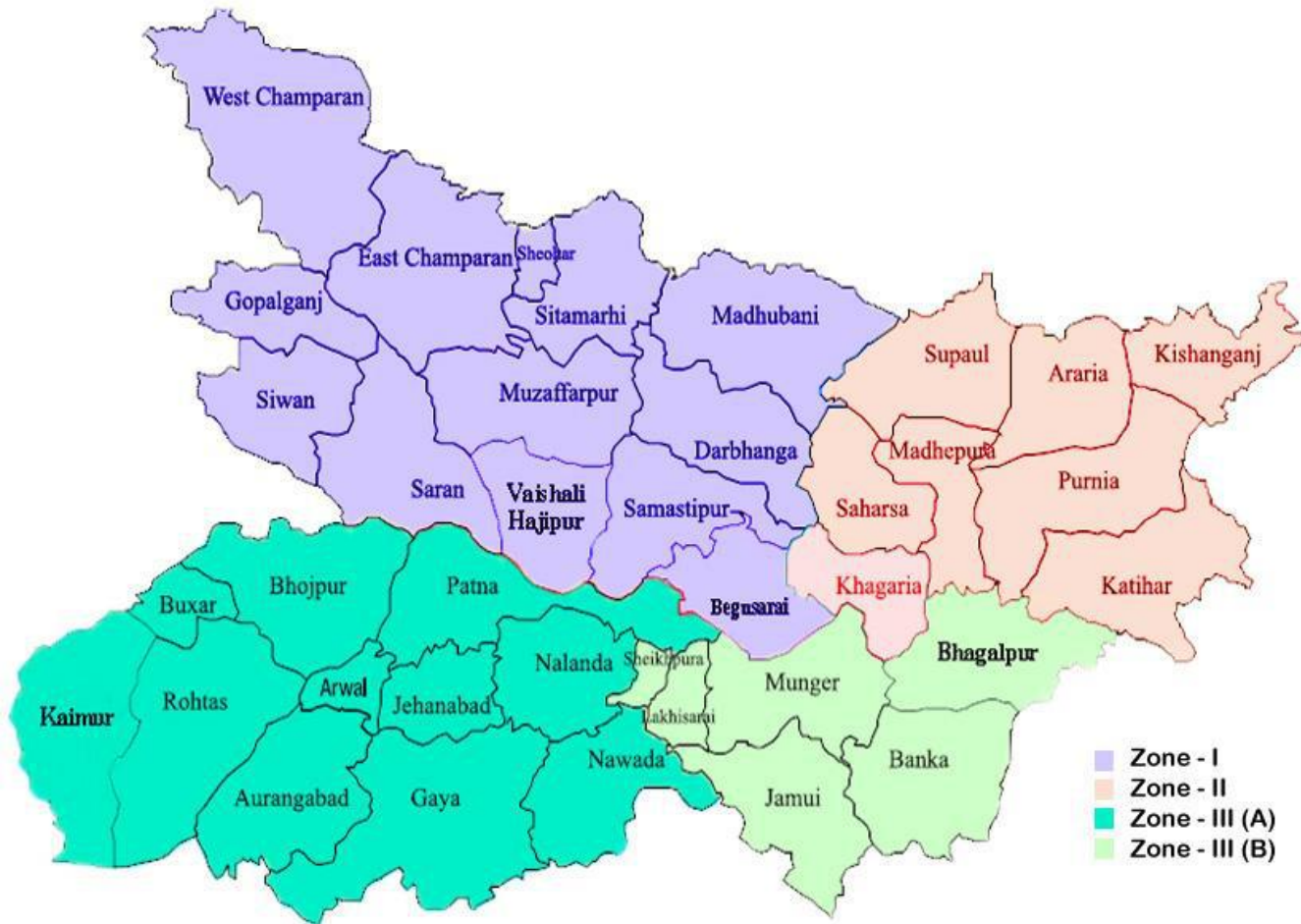
| 1.12 | Sowing window for 5 major crops (Start and end of sowing period) | Rice | Wheat | Boro-Paddy | Pulses | Maize |
|------|--|----------|--|---|-------------------|--------------------|
| | Kharif Rainfed | May-June | - | | June | May-June |
| | Kharif Irrigated | May-June | - | - | July-August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

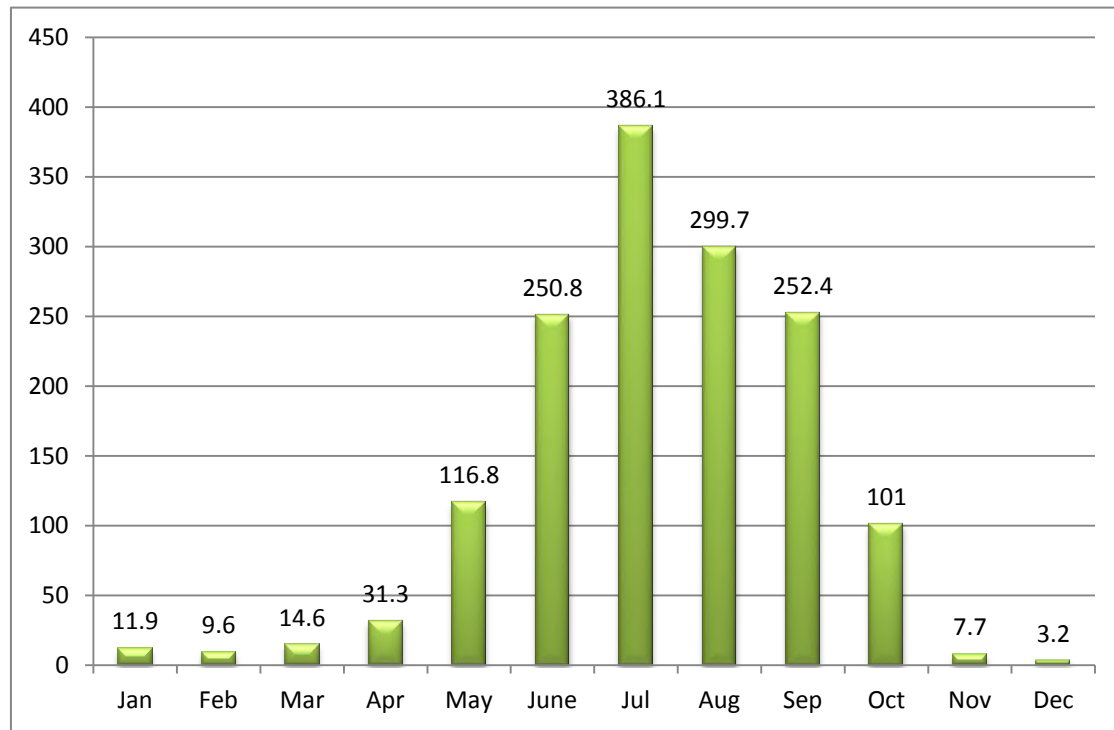
Agro climatic Zones of Bihar



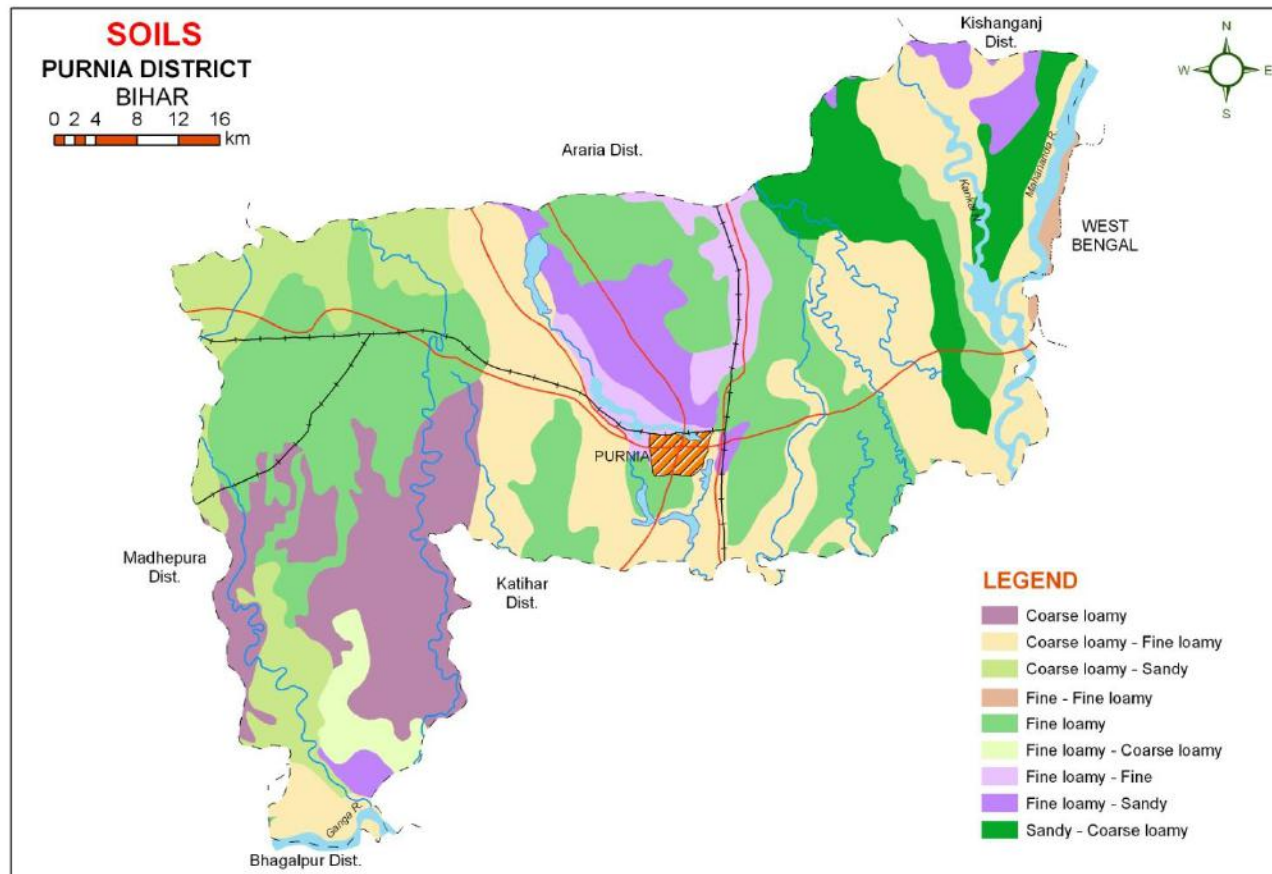
Source: krishi.bih.nic.in

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 st 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"> • Adopt normal package of practices • Use 3-4 seedling per hill • Raise staggered community nursery preferably with medium duration varieties in mid lands • Dapog Nursery • Adopt SRI technology • Interculture for timely weed control | |
| | Lowland | (Shallow Lowland) Rice-PairaLentil Rice-Late Wheat-Green gram(Local) (Deep Lowland) 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 |
| Delay by 4 weeks 3 rd week of July | Upland | Maize-wheat-Green gram(Local) Sesame-Lentil-Green gram(Local) Maize-Maize/Potato | Short Duration maize-Shaktiman1 to5. Sesame-Krishana | Normal package of practices ▪ Interculture for timely weed control. | Seeds from BAU, Sabour, NSC,TDC, BRBN etc. • Para grass cultivation for fodder in Lowland |
| | Medium land | Rice-wheat-Green gram(Local) Rice-Lentil/Potato Rice-Maize Jute-Potato | Short duration Rice – wheat Rice – Prabhat, Sahbhagi, Rajendra Bhagawati, Rajendra Suwasni Rajshree, -44 | <ul style="list-style-type: none"> • Use Community nursery/ dapog nursery for quick availability of young seedlings for transplanting of short duration varieties by first fortnight of August in mid lands. • Transplant with 3-4 seedling per hill with close spacing. | |
| | Lowland | (Shallow Lowland) Rice-PAIRaLentil Rice-Late Wheat-Green gram(Local) (Deep | Medium duration Rice-Direct sowing with brown manuring. Long duration/Deep | <ul style="list-style-type: none"> • Timely interculture for weed control in direct seeded rice. | |

| 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 st 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"> Life saving irrigation | 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"> 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 Direct seedling of Rice Raise staggered community nursery preferably with medium duration varieties in mid and lowlands | |
| | Lowland | (Shallow Lowland) Rice-PairaLentil Rice-Late Wheat- Green gram(Local) (Deep Lowland) Rice-Boro Rice | Medium duration Rice – PairaLentil | <ul style="list-style-type: none"> Enhanced basal dose of NPK to boost the early vegetative growth Life saving irrigation | |

| 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 rd 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"> • Inter culture. • Life saving irrigation. | 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"> • 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 | |
| | Lowland | (Shallow Lowland) Rice-PairaLentil Rice-Late Wheat- Green gram(Local) (Deep Lowland) Rice-Boro Rice | <u>Euryale ferox salberis</u> (Makhana) <u>Euryale ferox salberis</u> (Makhana) | <ul style="list-style-type: none"> • Vegetables can be taken up on time for maximizing productivity from lowlands in early kharif. • | |

| 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"> • Gap filling • Life saving irrigation | 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) | | |
|--|--|------------|--|--|

| 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"> 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 | |
| | 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 | |
|--|--|--|--|-----------------------------|--|

| 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 |
| Horticulture | Vegetative Stage | Flowering Stage | Crop Maturity Stage | Post Harvest |
| 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 |
| Heavy rainfall with high speed winds is in short span | Vegetative Stage | Flowering Stage | Crop Maturity Stage | Post Harvest |
| 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 |
| Horticulture | Vegetative Stage | Flowering Stage | Crop Maturity Stage | Post Harvest |
| 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 |
| Outbreak of pests and diseases due to unseasonal rains | | | | |
| Rice | <ul style="list-style-type: none"> ❖ For Plant Hopper, Leaf Hopper management spray Imidacloprid 0.01% ❖ Seedling treatment with granular insecticide – Cartap hydrochloride ❖ or phorate 10G or carbofuran 3G. ❖ Maintain shallow water in | <ul style="list-style-type: none"> ❖ For Rice gundhi Bug, dusting carbofuran 3G @ 1kg ai./ha ❖ Use copper fungicides against Bacterial leaf blight. ❖ Split application of | <ul style="list-style-type: none"> ❖ Harvest at physiological maturity | 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 |
| Horticulture | | | | |
| Mango | Mango Leaf hopper Spraying Malathion 1litre per ha / Imidacloprid @ 0.01% Anthracnose:- The foliar infection can be controlled by spraying of copper oxychloride (0.3%) Use bio control agent viz <i>Streptosporangium pseudovulgare</i> Bacterial canker: 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. | Mealy bug Spraying Malathion 1litre per ha / Imidacloprid @ 0.01% Anthracnose:- 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. Mango powdery mildew: Spray wettable sulphur(0.2%) & calixin or karathane (0.1%) during second week of December | Fruit fly Spraying Malathion 1litre per ha Mango powdery mildew: 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 Anthracnose:- 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. Mango bacterial canker: 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 |
| Transient water logging partial inundation | | | | |
| 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 |
| Horticulture | | | | |
| 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 |
| Continuous submergence for more than 2 days | | | | |
| 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 |
| Transient water logging partial inundation | 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 | | | | |
| Horticulture | | | | |
| 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 |
| Sea-water inundation | 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 |
| Heat Wave | | | | |
| 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 | - |
| Horticulture | | | | - |
| Mango, Guava, Banana, Lemon | Drip irrigation, Light irrigation | | | |
| Cold Wave* | | | | |

| Extreme events type | Suggested contingency measure | | | |
|-----------------------------------|---|---|---|------------|
| | Seedling/nursery stage | Vegetative stage | Reproductive stage | At harvest |
| Horticulture | | | | |
| 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 |
| Drought | | | |
| 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 |
| Floods | | | |
| 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 |
| Cyclone | | | |
| 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 |
| Heat wave and cold wave | | | |
| 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 |
| Drought | | | |
| 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 |
| Floods | | | |
| 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 |
| Cyclone | | | |
| 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 |
| Heat wave and cold wave | | | |
| 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 |
| Drought | | | |
| 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 |
| Floods | | | |
| 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 |
| Cyclone | | | |
| 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 |
| Heat wave and cold wave | | | |
| 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