



भारतीय कृषि
ICAR

INDIAN COUNCIL OF
AGRICULTURAL RESEARCH

DISTRICT WISE CONTINGENCY PLAN TO DEAL WITH **EL NIÑO**

PREPAREDNESS | RESPONSE | RESILIENCE



BUILDING A
DROUGHT RESILIENT
ARUNACHAL PRADESH

ARUNACHAL PRADESH



PADDY



MAIZE



MILLETS



EARLY WARNING
& MONITORING



WATER
MANAGEMENT



SUSTAINABLE
AGRICULTURE



COMMUNITY
PARTICIPATION

TOGETHER, LET'S BUILD A RESILIENT ARUNACHAL PRADESH

PREPARE TODAY • PROTECT TOMORROW • PROSPER TOGETHER

Arunachal Pradesh

Arunachal Pradesh located in the eastern Himalayan region of India and Agriculture is the primary source of livelihood for a majority of the population in Arunachal Pradesh and plays a crucial role in the state's economy and socio-cultural life. Arunachal Pradesh is endowed with diverse agro-climatic conditions, abundant rainfall, fertile valleys, rich forest resources, and a wide range of altitudes ranging from tropical foothills to alpine regions. These varied ecological conditions support the cultivation of numerous agricultural and horticultural crops throughout the state.

Arunachal Pradesh practices both traditional and modern farming. Shifting cultivation (locally known as jhum cultivation) has been practiced for centuries by many tribal communities, although efforts are being made to promote settled and sustainable agriculture. The major food crops grown in the state include rice, maize, millets, wheat, and pulses. Rice is the staple crop and occupies the largest share of cultivated land, particularly in the valley regions. Other important crops include oilseeds, sugarcane, ginger, turmeric, and large cardamom.

Horticulture is one of the fastest-growing sectors in Arunachal Pradesh due to its favourable climatic conditions. The state is known for the cultivation of fruits such as orange, kiwi, apple, pineapple, banana, and pear, as well as a variety of vegetables and spices. Plantation crops, medicinal and aromatic plants, and floriculture also hold significant potential for income generation and agricultural diversification.

Despite its vast agricultural potential, the sector faces several challenges, including limited irrigation facilities, difficult terrain, fragmented landholdings, inadequate market infrastructure, poor transportation connectivity, and dependence on monsoon rainfall. Nevertheless, agriculture continues to be the backbone of the state's economy, providing livelihood support to a large proportion of the rural population. With increasing emphasis on sustainable farming, organic agriculture, improved technologies, and value addition, Arunachal Pradesh has significant opportunities to enhance agricultural productivity and strengthen rural livelihoods while preserving its rich ecological heritage.

Historical impact of El Nino in Arunachal Pradesh

Arunachal Pradesh, located in the Eastern Himalayan region of India, generally receives high annual rainfall from the southwest monsoon and is less directly affected by El Niño than the drought-prone regions of central and western India. However, strong El Niño events have historically influenced rainfall patterns, temperature regimes, and agricultural productivity in the state. The impacts are often reflected through delayed monsoon onset, uneven rainfall distribution, prolonged dry spells, reduced soil moisture, and increased temperatures during critical crop growth periods.

Major El Niño years such as 1982–83, 1987, 1997–98, 2002, 2009, 2015–16, and 2023–24 were associated with rainfall anomalies across Northeast India, including Arunachal Pradesh. During these periods, several districts experienced below-normal rainfall, reduced stream flow, and moisture stress in rainfed farming systems. The adverse effects were particularly noticeable in upland and jhum cultivation areas, where agriculture is highly dependent on seasonal rainfall.

El Niño-induced dry conditions have increased the incidence of forest fires in several parts of Arunachal Pradesh, affecting biodiversity, soil health, and watershed functions. Reduced water availability in springs and streams during strong El Niño years has also impacted irrigation, livestock, and rural livelihoods. Although the state remains relatively resilient due to its generally high rainfall, increasing climate variability and recurring El Niño events have heightened concerns regarding agricultural sustainability and food security.

Effect on major crops

Rice (Paddy): Delayed monsoon and dry spells affect sowing, tillering, and grain filling, leading to yield reduction.

Maize: Moisture stress during germination and flowering reduces plant growth and grain formation.

Millets: Reduced rainfall during critical growth stages lowers biomass production and grain yield.

Pulses (Rajma, Black Gram, Green Gram, Lentil): Moisture stress during flowering and pod filling decreases pod formation and seed yield.

Rapeseed-Mustard: Low residual soil moisture affects germination, flowering, and seed development, reducing productivity.

Ginger: Inadequate rainfall hampers rhizome development and lowers yield and quality.

Turmeric: Dry conditions reduce rhizome growth and curcumin content, resulting in lower yields.

Large Cardamom: Moisture stress reduces flowering, capsule formation, and overall productivity.

Apple: Higher temperatures and moisture deficits affect flowering, fruit size, and yield.

Vegetables: Heat stress and erratic rainfall increase flower drop, pest incidence, and yield losses.

Sugarcane: Moisture deficits reduce cane growth, biomass accumulation, and sugar recovery.

Contingency plans for major crops in Arunachal Pradesh

Crop	Contingency Situation	Recommended Contingency Measures
Rice (Paddy)	Delayed monsoon, drought, moisture stress	Adopt short-duration and drought-tolerant varieties, raise community nurseries, undertake direct seeding where feasible, practice mulching and moisture conservation, provide life-saving irrigation.
Maize	Delayed sowing and prolonged dry spells	Use short-duration varieties, sow immediately after receipt of rainfall, adopt ridge-furrow planting, conserve moisture through mulching, provide protective irrigation at tasselling and grain filling stages.
Millets	Moisture stress in upland areas	Promote drought-tolerant millet varieties, undertake timely sowing, adopt intercropping with pulses, practice in-situ moisture conservation and mulching.
Pulses	Delayed sowing and moisture deficit	Use short-duration varieties, adjust sowing dates, utilize residual soil moisture, undertake seed treatment and foliar nutrient application, practice mulching.
Rapeseed-Mustard	Low residual soil moisture after <i>kharif</i>	Adopt early-maturing varieties, ensure timely sowing, practice minimum tillage and mulching, provide protective irrigation during flowering and pod formation.
Ginger	Inadequate rainfall and soil moisture deficit	Apply organic mulches, conserve soil moisture through contour bunding, use healthy seed rhizomes, provide supplemental irrigation during dry periods.
Turmeric	Prolonged dry spells	Adopt mulching with crop residues, ensure timely planting, harvest rainwater, provide protective irrigation during rhizome development.
Large Cardamom	High temperature and rainfall deficit	Maintain adequate shade, apply organic mulches, conserve soil moisture through trenching, undertake rainwater harvesting, replace dried plants promptly.

Apple	Moisture deficit in higher elevations	Apply organic mulches, undertake water harvesting, provide irrigation during flowering and fruit development, maintain orchard sanitation and nutrient management.
Vegetables	Heat stress and erratic rainfall	Raise seedlings in protected nurseries, adopt drip irrigation and mulching, use shade nets during extreme heat, grow short-duration varieties.
Sugarcane	Moisture deficit during growth stages	Adopt trench planting and trash mulching, use drought-tolerant varieties, provide irrigation at critical stages, undertake earthing-up and organic matter application.

Arunachal Pradesh possesses immense agricultural potential owing to its diverse agro-climatic conditions, rich natural resources, and wide range of crops. While the state generally receives abundant rainfall, recurring El Niño events can disrupt monsoon patterns, leading to delayed rainfall, prolonged dry spells, moisture stress, and reduced crop productivity. Major crops such as rice, maize, millets, pulses, rapeseed-mustard, ginger, turmeric, large cardamom, apple, vegetables, and sugarcane are particularly vulnerable to these climatic anomalies. Therefore, promoting climate-resilient agriculture through drought-tolerant varieties, efficient water management, rainwater harvesting, soil moisture conservation, and timely contingency planning is essential to minimize risks and ensure sustainable agricultural growth, food security, and livelihood resilience in Arunachal Pradesh.

Districts vulnerable to El Nino

High	Medium	Low
Longding, Tawang, Tirap, West Kameng	Nil	Nil

Actionable Comprehensive Plans for Contingency

State	ARUNACHAL PRADESH	District	LONGDING
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	0	More than 19%	Less than 0
June			
July			
August			
September			

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	924	Gross irrigated area:	924
Net Rainfed area	7749	Gross rainfed area	9434

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	-	-
Wells	-	-
Tanks	-	-
Other sources	924	924

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	3145	924	2221
2	Jowar	-	-	
3	Maize	1852		1852
4	Bajra	-		
5	Ragi	2779		2779

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	25		25
2	Groundnut	-		
3	Sesamum	-		
4	SOyabean	85		85
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	-		
2	Tobacco	-		
3	Guar seed	-		
4	Other Fodder crops	-		

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 4 weeks (1 st week of July)	AES-I (Very steeply sloping hills-shallow loamy soils)				
	AES-II (Steeply sloping side slopes of hills-very deep fine soils)	Paddy	1, Short duration rice varieties like RCM-11, RCM-12 (90-100 days) etc . 2. drought tolerant varieties crop i.e. Luit, Kapilee, Vandana, Anjali etc	1. Apply life saving irrigation to maintain nursery 2. When the mortality of seedlings is less than 50% gap filling should be done	Schemes from Line Dept. /RKVY/ ATMA

				3..In-situ rain water conservation, practices like summer ploughing, interculture tillage practices, weeds and pest control .	
		Maize	1.Short duration crops/varieties like QPM 9, RCM-75 and RCM-76 (75-80 days). 2.Inter cropping with crops like green gram, cowpea as it helps in risk sharing.	1.Conservation of pre-monsoon soil moisture through soil/straw/grass mulching practices	
		Foxtail Millet	1. Introduction of short duration suitable foxtail varieties. 2. Growing of drought tolerant varieties like PR-202, VL-315, VR-708 etc.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation.	
		Colocasia	1.Instead of cultivating local cultivar, introduce variety like Kandyam – C, ML-1, ML-9 etc.	1. Proper and timely weeding. 2. Balance application of fertilizer, mulching and providing life saving irrigation at critical stages	
		Tapioca	1.Introduction of short duration variety i.e. CO (TP) 4, 2.Growing drought tolerant varieties such as H-87, Sree Vijaya.	1. Proper and timely weeding. 2. Balance application of fertilizer and providing life saving irrigation during critical stages. 3. Integrated Pest Management.	
	AES-III (Moderately side slopes of hills- deep fine soils)	Paddy	Short duration varieties like RCM-11, RCM-12 (90-100days), select drought tolerant varieties i.e. Luit, Kapilee, Vandana, Anjali etc	1. Provide life saving irrigation 2.When the mortality of seedlings 30% or less , gap filling should be done 3..In-situ rain water conservation, practices like summer ploughing, interculture tillage practices, weed control .	Schemes from Line Dept. /RKVY/ ATMA
		Maize	1.Short duration Crops/varieties like QPM 9, RCM-75 and drought tolerant like RCM-76 (75-80 days).	1.Conservation of pre-monsoon soil moisture through soil/straw/grass	

			2. Inter cropping with green gram, cowpea as it helps in risk sharing.	mulching practices, deeper ploughing	
		Cowpea	Select drought tolerant varieties like VCP 16, CO 6 and CO (CP) 711	1. Mulching 2. Maintain proper dept of sowing. 3. Application of organic manures before sowing & deep ploughing 2-3 times.	
		Soyabean	1. Introduction of short and semi drought resistant varieties like MAUS-71, MAUS-162.	1. Timely weeding. 2. Intercropping with Maize. 3. During large spell of drought life saving irrigation should be provided from any available water sources	
		Vegetable crops (Bottle gourd, Chilli, beans, okra, brinjal)		1. Prefer Drip/sprinkler irrigation if possible to save water 2. Conserved moisture through deep tillage 4. Enhancing cucurbitaceous vegetables by raising nursery in polythene bags and furrow planting to skip 2-3 irrigations.	
		Foxtail Millet	1. Introduction of short duration varieties. 2. Growing of drought tolerant varieties like PR-202, VL-315, VR-708 etc.	1. Proper and timely weeding. 2. Balance application of fertilizer and life saving irrigation	
		Colocasia	1. Instead of cultivating local cultivar, introduce variety like Kandyam – C, ML-1, ML-9 etc.	1. Proper and timely weeding. 2. Balance application of fertilizer and life saving irrigation	
		Tapioca	1. Introduction of short duration Tapioca variety i.e. CO (TP) 4, 2. Growing of drought resistance varieties i.e. H-87, Sree Vijaya.	1. Proper and timely weeding. 2. balance application of fertilizer and life saving irrigation. 3. Integrated Pest Management.	

Contingency measures- Mid season

Condition			Suggested Contingency measures
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Mid season drought (Long dry spell consecutive 2 weeks rainless (> 2.5 mm) period) Vegetative Stage	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
	AES-I (Very steeply sloping hills-shallow loamy soils)				
	AES-II (Steeply sloping side slopes of hills-very deep fine soils)	Paddy	1. Weeding/Intercultural operations to reduce crop stand. It will reduce intra-specific competition and enhanced water availability to the single plant.	1. Mulching with locally available biomass as it will reduce runoff and evaporation from bare soil surfaces. 2. Application of organic fertilizers e.g. crop residues, green manure, slurry and farmyard manure. 3. In situ moisture conservation by construction of bunds. 4. Making jalkund	Schemes from Line Dept. /RKVY/ ATMA
		Maize	1. Weeding/Intercultural operations to reduce crop stand. It will reduce intra-specific competition and enhanced water availability to the single plant.	1. Mulching with locally available biomass. 2. Deep Tillage. 3. Application of anti transpirant like ABA.	
		Foxtail Millet	1. Introduction of short duration suitable foxtail varieties. 2. Growing of drought tolerant varieties like PR-202, VL-315, VR-708 etc.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation.	
		Colocasia	1. Instead of cultivating local cultivar, introduce variety like Kandyam – C, ML-1, ML-9 etc.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation.	
		Tapioca	1. Introduction of short duration Tapioca variety i.e. CO (TP) 4, 2. Growing of drought resistance varieties i.e. H-87, Sree Vijaya.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation. 3. Integrated Pest Management.	

	AES-III (Moderately side slopes of hills- deep fine soils)	Paddy	1. Weeding/Intercultural operations to reduce crop stand. It will reduce intra-specific competition and enhanced water availability to the single plant.	1. Mulching with locally available biomass as it will reduce runoff and evaporation from bare soil surfaces. 2. Application of organic fertilizers e.g. crop residues, green manure, slurry and farmyard manure. 3. In situ moisture conservation by construction of bunds. 4. Making jalkund	
		Maize	1. Weeding/Intercultural operations to reduce crop stand. It will reduce intra-specific competition and enhanced water availability to the single plant.	1. Mulching with locally available biomass. 2. Deep Tillage. 3. Application of anti transpirant like ABA.	
		Cowpea	Prefer drought tolerant varieties like VCP 16, CO 6 and CO (CP) 711	1. Mulching 2. Maintain proper dept of sowing. 3. Adoption of moisture conservation practices like ploughing. 4. Application of organic manures before sowing & deep ploughing 2-3 times. 4. Adoption of Basin listing as it provides enough time to rain water to infiltrate into soil. 5. Adoption of compartmental bunding 6. Making jalkund	
		Soyabean	1. Introduction of soyabean varieties like MAUS-71, MAUS-162.	1. Mulching 2. Maintain proper dept of sowing. 3. Adoption of moisture	

				conservation practices like ploughing. 4. Application of organic manures before sowing & deep ploughing 2-3 times. 4. Adoption of Basin listing as it provides enough time to rain water to infiltrate into soil. 5. Adoption of compartmental bunding. 6. Making jalkund	
		Vegetable crops (Bottle gourd, Chilli, beans, okra, brinjal)		1. Mulching 2. Maintain proper dept of sowing. 3. Adoption of moisture conservation practices like ploughing. 4. Application of organic manures before sowing & deep ploughing 2-3 times. 4. Adoption of Basin listing as it provides enough time to rain water to infiltrate into soil. 5. Adoption of compartmental bunding. 6. Making jalkund 7. Enhancing cucurbitaceous vegetables by raising nursery in polythene bags followed by transplanting in order to save 2-3 irrigations.	
		Tapioca	1. Introduction of short duration Tapioca variety i.e. CO (TP) 4, 2. Growing of drought resistance varieties i.e. H-87, Sree Vijaya.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation. 3. Integrated Pest Management.	

		Foxtail Millet	1. Introduction of short duration suitable foxtail varieties. 2. Growing of drought tolerant varieties like PR-202, VL-315, VR-708 etc.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation.	
		Colocasia	1. Instead of cultivating local cultivar, introduce variety like Kandyam – C, ML-1, ML-9 etc.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation.	

Condition			Suggested Contingency measures		
Mid season drought (Long dry spell consecutive 2 weeks rainless long dry)	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
At flowering/Fruiting Stage	AES-I (Very steeply sloping hills-shallow loamy soils)				
	AES-II (Steeply sloping side slopes of hills-very deep fine soils)	Paddy	1. Changing crop calendars to avoid extreme heat and drought. 2. Weeding/Intercultural operations to reduce crop stand. It will reduce intra-specific competition and enhanced water availability to the single plant.	Mulching with locally available biomass as it will reduce runoff and evaporation from bare soil surfaces. 2. Application of organic fertilizers e.g. crop residues, green manure, slurry and farmyard manure. 3. In situ moisture conservation by construction of bunds. 4. Making jalkund	Schemes from Line Deptt. /RKVY/ ATMA
		Maize	1. Changing crop calendars to avoid extreme heat and drought. 2. Weeding/Intercultural operations to reduce crop stand. It will reduce intra-specific competition and enhanced water availability to the single plant.	1. Mulching with locally available biomass. 2. Deep Tillage. 3. Application of anti transpirant like ABA.	
		Tapioca	1. Introduction of short duration Tapioca variety i.e. CO (TP) 4,	1. Proper and timely weeding.	

			2. Growing of drought resistance varieties i.e. H-87, Sree Viajya.	2. Application of fertilizer and proper irrigation. 3. Integrated Pest Management.	
		Foxtail Millet	1. Introduction of short duration suitable foxtail varieties. 2. Growing of drought tolerant varieties like PR-202, VL-315, VR-708 etc.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation.	
		Colocasia	1. Instead of cultivating local cultivar, introduce variety like Kandyam – C, ML-1, ML-9 etc.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation.	
	AES-III (Moderately side slopes of hills- deep fine soils)	Paddy	1. Changing crop calendars to avoid extreme heat and drought. 2. Weeding/Intercultural operations to reduce crop stand. It will reduce intra-specific competition and enhanced water availability to the single plant.	Mulching with locally available biomass as it will reduce runoff and evaporation from bare soil surfaces. 2. Application of organic fertilizers e.g. crop residues, green manure, slurry and farmyard manure. 3. In situ moisture conservation by construction of bunds. 4. Making jalkund	
		Maize	1. Changing crop calendars to avoid extreme heat and drought. 2. Weeding/Intercultural operations to reduce crop stand. It will reduce intra-specific	1. Mulching with locally available biomass. 2. Deep Tillage. 3. Application of anti transpirant like ABA.	

			competition and enhanced water availability to the single plant.		
			1. Growing vegetables such as cluster bean, cowpea, lablab bean, radish, peas which can sustain with less amount of water.	1. Making fields free of weeds for full utilization of water and nutrients by the crops. 2. Strengthen the field and contour bunds for in-situ moisture conservation.	
		Cowpea	Prefer drought tolerant varieties like VCP 16, CO 6 and CO (CP) 711	1. Mulching 2. Maintain proper dept of sowing. 3. Adoption of moisture conservation practices like ploughing. 4. Application of organic manures before sowing & deep ploughing 2-3 times. 4. Adoption of Basin listing as it provides enough time to rain water to infiltrate into soil. 5. Adoption of compartmental bunding 6. Making jalkund	
		Soyabean	MAUS-71)	1. Mulching 2. Maintain proper dept of sowing. 3. Adoption of moisture conservation practices like ploughing. 4. Application of organic manures before sowing & deep ploughing 2-3 times. 4. Adoption of Basin listing as it provides enough time to rain water	

				to infiltrate into soil. 5. Adoption of compartmental bunding. 6. Making jalkund	
		Vegetable crops (Bottle gourd, Chilli, beans, okra, brinjal)		1. Mulching 2. Maintain proper dept of sowing. 3. Adoption of moisture conservation practices like ploughing. 4. Application of organic manures before sowing & deep ploughing 2-3 times. 4. Adoption of Basin listing as it provides enough time to rain water to infiltrate into soil. 5. Adoption of compartmental bunding. 6. Making jalkund 7. Enhancing cucurbitaceous vegetables by raising nursery in polythene bags followed by transplanting in order to save 2-3 irrigations.	
		Tapioca	1. Introduction of short duration Tapioca variety i.e. CO (TP) 4, 2. Growing of drought resistance varieties i.e. H-87, Sree Vijaya.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation. 3. Integrated Pest Management.	
		Foxtail Millet	1. Introduction of short duration suitable foxtail varieties. 2. Growing of drought tolerant varieties like PR-202, VL-315, VR-708 etc.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation.	
		Colocasia	1. Instead of cultivating local cultivar, introduce variety like Kandyam – C, ML-1, ML-9 etc.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation.	

Contingency measures- End of the season

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
	AES-I (Very steeply sloping hills-shallow loamy soils)				
	AES-II (Steeply sloping side slopes of hills-very deep fine soils)	Paddy	1.Changing crop calendars to avoid extreme heat and drought. 2. Weeding/Intercultural operations to reduce crop stand. It will reduce intra-specific competition and enhanced water availability to the single plant.	1.Mulching 2. Adoption of moisture conservation practices like ploughing. 3. Application of organic manures before sowing & deep ploughing 2-3 times. 4Making jalkund	Schemes from Line Dept. /RKVY/ ATMA
		Maize		1. Mulching with locally available biomass. 2. Application of anti transpirant like ABA,PMA, Aspirin etc.	
		Tapioca	1.Introduction of short duration Tapioca variety i.e. CO (TP) 4, 2.Growing of drought resistance varieties i.e. H-87, Sree Vijaya.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation. 3. Integrated Pest Management.	
		Foxtail Millet	1. Introduction of short duration suitable foxtail varieties. 2. Growing of drought tolerant varieties like PR-202, VL-315, VR-708 etc.	1. Proper and timely weeding. 2. Application of fertilizer and proper irrigation.	
		Colocasia	1.Instead of cultivating local cultivar, introduce variety like Kandyam – C, ML-1, ML-9 etc.	1. Proper and timely weeding. 2.Applclation of fertilizer and proper irrigation	
	AES-III (Moderately side slopes of hills- deep fine soils)	Paddy	1. Changing crop calendars to avoid extreme heat and drought. 2. Weeding/Intercultural operations to reduce crop stand. It will reduce intra-specific	1.Mulching 2. Adoption of moisture conservation practices like ploughing. 3. Application of organic manures before sowing &	

			competition and enhanced water availability to the single plant.	deep ploughing 2-3 times. 4 Making jalkund	
		Maize		1. Mulching with locally available biomass. 2. Application of anti transpirant like ABA, PMA, Aspirin etc.	

Resource management technologies

1. Construction and renovation of low cost water harvesting structure Jalkunds for providing supplemental irrigations to *rabi* crops and during dry spells to produce higher yields
2. Lifesaving irrigation to rabi crops from Jalkund and natural stream to get more crop yield
3. Low cost vermicompost unit to enhance the soil fertility and also increase the moisture holding capacity of the soil
4. Green manuring (Dhaincha) to enhance the soil fertility
5. Bio-mulching and bio degradable plastic to conserve moisture, obtain higher yield in cash crops
6. Organic mulching in pea (Chakra) to conserve moisture and increase crop yield
7. Location specific intercropping systems of potato + pea, maize + black gram to increase the cropping intensification thereby increasing crop yield
8. Zero tillage in pea to conserve soil moisture thereby increase crop yield

Actionable Comprehensive Plans for Contingency

State	ARUNACHAL PRADESH	District	TAWANG
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	983	More than 19%	Less than 796.23
June	204.7		
July	327.7		
August	230.6		
September	220		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	394	Gross irrigated area:	407
Net Rainfed area	4096	Gross rainfed area	6026

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	-	-
Wells	-	-
Tanks	-	-
Other sources	394	407

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	952	143	809
2	Jowar	-	-	
3	Maize	960		960
4	Bajra	-		
5	Ragi	1302		1302

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	-		
2	Groundnut	-		
3	Sesamum	-		
4	SOyabean	337		337
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	-		
2	Tobacco	-		
3	Guar seed	-		
4	Other Fodder crops	-		

Crop Plan- Beginning of the season

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
Early season drought (delayed onset)			Change in crop /cropping system including variety	Agronomic measures	Remarks on Implementation
Delayed by 2 weeks (2nd to 3rd week of April)	Moderately sloping side slopes with deep loamy soils (600-1200m MSL).	Maize	Short duration crops/varieties like RCM-1-75, RCM-1-76	- Conservation of pre-monsoon soil moisture through soil/straw/grass mulching practices - Maize + groundnut/soya bean/rice bean inter cropping. - Hydropriming/ seed soaking in water for 24hr and followed by shade drying before sowing.	Schemes for line department/RKVY/ ATMA

				▪ Application of organic manure before sowing.	
		Millet	Short duration crops/varieties of finger millet (VR-708, GPU-67)	-	-
		Black gram	Short duration crops/varieties like USJD113, KU301	-	-
	Steeply sloping hill loamy soil (> 1200m MSL)	Millet	Short duration crops/varieties of finger millet (VR-708, GPU-67), foxtail millet (SR-16, Meera)	-	-

Contingency measures- Mid season

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm)period)	Major Farming situation	Normal Crop /cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Vegetative stage	Moderately sloping side slopes with deep loamy soils (600-1200m MSL).	Maize	▪ Weeding ▪ Interculture ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching with locally available material	Schemes for line department/RKVY/ ATMA
		Millet	▪ Weeding ▪ Interculture ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching with locally available material	-
		Black gram	▪ Weeding ▪ Interculture ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching with locally available material	-
	Steeply sloping hill loamy soil (> 1200m MSL)	Millet	▪ Weeding ▪ Interculture ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching with locally available material	-
Reproductive stage	Moderately sloping side slopes with deep loamy soils (600-1200m MSL).	Maize	▪ Weeding ▪ Interculture ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching with locally available material	Schemes for line department/RKVY/ ATMA

		Millet (finger millet)	▪ Weeding ▪ Interculture ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching with locally available material	-
		Black gram	▪ Weeding ▪ Interculture ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching with locally available material	-
	Steeply sloping hill loamy soil (> 1200m MSL)	Millet (finger millet)	▪ Weeding ▪ Interculture ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching with locally available material	-

Contingency measures- End of the season

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Moderately sloping side slopes with deep loamy soils (600-1200m MSL).	Maize	▪ Harvest at physiological maturity.	▪ Planning for zero tillage cultivation of pea. ▪ Preparation for cole crops	Schemes for line department/RKVY/ATMA
		Millet (finger millet)	▪ Harvest at physiological maturity.	▪ Planning for zero tillage cultivation of pea. ▪ Preparation for cole crops	-
		Black gram	▪ Harvest at physiological maturity.	▪ Planning for zero tillage cultivation of pea. ▪ Preparation for cole crops	-
	Steeply sloping hill loamy soil (> 1200m MSL)	Millet (finger millet)	▪ Harvest at physiological maturity.	▪ Planning for zero tillage cultivation of pea. ▪ Preparation for cole crops	-

Resource management technologies

9. Construction and renovation of low cost water harvesting structure Jalkunds for providing supplemental irrigations to *rabi* crops and during dry spells to produce higher yields
10. Lifesaving irrigation to rabi crops from Jalkund and natural stream to get more crop yield
11. Low cost vermicompost unit to enhance the soil fertility and also increase the moisture holding capacity of the soil
12. Green manuring (Dhaincha) to enhance the soil fertility
13. Bio-mulching and bio degradable plastic to conserve moisture, obtain higher yield in cash crops

14. Organic mulching in pea (Chakra) to conserve moisture and increase crop yield
15. Location specific intercropping systems of potato + pea, maize + black gram to increase the cropping intensification thereby increasing crop yield
16. Zero tillage in pea to conserve soil moisture thereby increase crop yield

Actionable Comprehensive Plans for Contingency

State	ARUNACHAL PRADESH	District	TIRAP
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1948.9	More than 19%	Less than 1578.609
June	520.6		
July	632.7		
August	389.5		
September	406.1		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	1694	Gross irrigated area:	1713
Net Rainfed area	7382	Gross rainfed area	10246

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	-	-
Wells	-	-
Tanks	-	-
Other sources	1694	1713

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	3137	1292	1845
2	Jowar	-	-	
3	Maize	4054		4054
4	Bajra	-		
5	Ragi	1678		1678

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	37		37
2	Groundnut	-		
3	Sesamum	-		

4	SOyabean	113		113
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	-		
2	Tobacco	-		
3	Guar seed	-		
4	Other Fodder crops	-		

Crop Plan- Beginning of the season

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 (July 1st week)	Medium rainfall Sandy loam soil, plain lands	Rice	Grow medium duration rice varieties like Satya, Basundhara etc Prefer drought tolerant varieties of Paddy crop i.e. Luit, Kapilee, Vandana, Anjali etc	- Apply lifesaving irrigation to maintain nursery - When the mortality of seedlings is less than 50% gap filling should be done - In-situ rain water conservation, practices like summer ploughing, interculture, tillage practices, weed control. - Use of minimum tillage	Supply of seeds through Dept.pf Agri, ATMA
		Sesamum	Use of varieties like Gouri, Vinayak, AST-1683, AST-1		
		Soybean	Variety like JS-335, Bragg, moti	- Intercropping with maize (Last stage of maize) - Maintain 1:2 row ratio	

	Medium rainfall, low land	Rice	Prefer drought tolerant varieties of Paddy crop i.e. Luit, Kapilee, Vandana, Anjali etc Sujata, Durga, PDM-11& 54	- Nursery can be raised for transplanting after Use of bulky organic manures with full P,K and 50% N of recommended dose for basal application. - Maintain more plant population - When the mortality of seedlings is less than 50%, gap filling should be done.	Supply of seeds through Dept.pf Agri, ATMA
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Contingency measures- Mid season

Condition	Suggested Contingency Measures				
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measure	Remarks on Implementation
At vegetative stage	Medium rainfall Sandy loam soil, plain lands	Rice Maize Mustard Vegetable Pulse	- Proper weed management - Maintain proper spacing - Foliar application of nutrients 2% Urea or 2% DAP	- Remove weeds - Strengthen the field bunds & close the holes - Provide life saving irrigation. - Application of mulching - Organic mulching with previous crop residues. - Follow ridge and furrow method of planting - Making jalkund - Minimize runoff and percolation loss of water.	Supply of seed drills and intercultural implements Supply seeds from ATMA, Dept. of Agril.
	Medium rainfall low land	Rice	- Foliar application of nutrients 2% Urea or 2% DAP - Gap filling Foliar application of nutrients 2% Urea or 2% DAP or 1% KNO₃	. Remove weeds - Strengthen the field bunds & close the holes - Provide life saving irrigation.	Supply of seed drills and intercultural implements Supply seeds from ATMA, Dept. of Agril.

At reproductive stage	Medium rainfall Sandy loam soil, plain lands	Rice Maize Mustard Vegetable Pulse	- Rice variety: CAU R-1, Ranjit - Mustard: TS-38, TS-46 - Foliar application of 2% urea at pre-flowering and flowering stage to pulses and oilseeds - Remove and destroy pest and disease affected plants - Spray 2% KCl + 0.1 ppm boron to non paddy crops to overcome drought	- Provide irrigation at flowering and grain filling stage. - Harvesting and recycling of rain water - Provide life saving irrigation. - In case of complete failure of Kharif crop, go for pre-rabi crops/ pulses/vegetable crop cultivation.	Supply of seed drills and intercultural implements Supply seeds from ATMA, Dept. of Agril.
	Medium rainfall low land	Rice	Foliar application of 2% urea at pre-flowering	- Provide irrigation at flowering and grain filling stage. - Harvesting and recycling of rain water - Provide life saving irrigation. - In case of complete failure of Kharif crop, go for early rabi crop cultivation.	Supply of seed drills and intercultural implements Supply seeds from ATMA, Dept. of Agril.

Contingency measures- End of the season

Condition	Suggested Contingency Measures				
Terminal drought	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Medium rainfall Sandy loam soil, plain lands	Rice Maize Mustard Vegetable Pulse	Harvesting at physiological maturity stage of the crop not at visual maturity. Vegetable should be harvested at early than full maturity	- Construction of Jalkund - Utilization of residual moisture for early sowing of rabi crops through mulching, ridge planting	Construction of Farm ponds through NREGS, RKVY Supply seeds through ATMA, RKVY
	Medium rainfall low land	Rice	Harvesting at physiological maturity stage of the crop	- Construction of Jalkund - Utilization of residual moisture for early sowing of rabi crops	Construction of Farm ponds through NREGS, RKVY Supply seeds through ATMA, RKVY

Drought- Irrigated situation

Condition	Suggested Contingency Measures				
Delayed/ limited release of water in streams due to low rainfall	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Sandy loam soils, stream / lift irrigation system	Rice-Fallow Rice – Mustard/rabi vetable	Rice – potato Rice – Rapeseed Rice – rabi pulses/ vegetables/ potato	Mulching in rabi season Limited & life saving irrigation, alternate furrow irrigation, drip irrigation, Irrigation in root zone, Proper intercultural operation	Seeds through ATMA, RKVY, Dept. of Agril. Supply of seed drill and intercultural implements

Resource management technologies

17. Construction and renovation of low cost water harvesting structure Jalkunds for providing supplemental irrigations to *rabi* crops and during dry spells to produce higher yields
18. Lifesaving irrigation to rabi crops from Jalkund and natural stream
19. Low cost vermicompost unit to enhance the soil fertility and also increase the moisture holding capacity of the soil
20. Green manuring (Dhaincha) to enhance the soil fertility
21. Bio-mulching and bio degradable plastic to conserve moisture, obtain higher yield in cash crops
22. Organic mulching in pea (Chakra) to conserve moisture and increase crop yield
23. Zero tillage in pea to conserve soil moisture thereby increase crop yield

Actionable Comprehensive Plans for Contingency

State	ARUNACHAL PRADESH	District	WEST KAMENG
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1696.4	More than 19%	Less than 1374.084
June	452.4		
July	496.7		
August	382.6		
September	364.7		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	326	Gross irrigated area:	337
Net Rainfed area	7888	Gross rainfed area	8998

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	-	-
Wells	-	-
Tanks	-	-
Other sources	326	337

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	963	223	740
2	Jowar	-	-	
3	Maize	3172		3172
4	Bajra	-		
5	Ragi	1318		1318

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	-		
2	Groundnut	-		
3	Sesamum	-		
4	SOyabean	143		143
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	-		
2	Tobacco	-		
3	Guar seed	-		
4	Other Fodder crops	-		

Crop Plan- Beginning of the season

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
Early season drought (delayed onset)			Change in crop /cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 2 weeks (3 rd to 4 th week of April)	Moderately steep sloping hills with deep loamy soils (200-800 m MSL)	Maize	No change - Short duration varieties like RCM-1-75, RCM-1-76, All-rounder - Maize + groundnut/soya bean/rajma inter cropping.	- Adopt mulching with locally available mulch - Summer ploughing to conserve moisture - Hydropriming/ seed soaking in water for 24hr and followed by shade drying before sowing. - Application of FYM/organic manure before sowing.	Schemes from Line Deptt. /RKVY/ ATMA
		Millets	No change Short duration varieties of finger	Application of FYM/organic manure before sowing.	

			millet (VR-708, GPU-67)	Summer ploughing to conserve moisture	
		Rajmaah	No change	- Application of FYM/organic manure before sowing. - Summer ploughing to conserve moisture - Adopt short duration varieties - Maintain closer spacing - Adopt intercropping with soyabean and maize	
		Vegetable crops	No change Kashi Anmol, Arka Lohit, Kashi Early, IIHR -Sel. 132	<u>Chilli</u> - Apply well decomposed FYM 5 tones/ha or vermicompost 1 ton/ha - Mulching with locally available biomass - Mixed cropping of various seasonal vegetable crops. <u>Tomato</u> - Apply well decomposed FYM 5 tones/ha or vermicompost 1 ton/ha - Mulching with locally available biomass - Adopt short duration varieties	
		Soybean	No change	- Mulching with locally available biomass - Intercropping with other beans - Application of organic manure before sowing.	
	Steep sloping deep loamy soils (800-1500m MSL)	Maize	No change - Short duration varieties like RCM-1-75, RCM-1-76, All-rounder - Maize + groundnut/soya bean/rajma inter cropping.	- Planting across slope - Adopt mulching with locally available mulch - Summer ploughing to conserve moisture - Hydropriming/ seed soaking in water for 24hr and followed by shade drying before sowing. - Application of FYM/organic manure before sowing.	
		Millets	No change Short duration varieties of finger millet (VR-708, GPU-67)	- Planting across slope - Application of FYM/organic manure before sowing. - Summer ploughing to conserve moisture	
		Vegetables crops	No change Kashi Anmol, Arka Lohit, Kashi Early, IIHR -Sel. 132	<u>Chilli</u> Apply well decomposed FYM 5 tones/ha or vermicompost 1 ton/ha	

				- Mulching with locally available biomass - Mixed cropping of various seasonal vegetable crops. Tomato - Apply well decomposed FYM 5 tones/ha or vermicompost 1 ton/ha - Mulching with locally available biomass - Adopt short duration varieties	
		Rajmaah	No change	- Application of FYM/organic manure before sowing. - Summer ploughing to conserve moisture - Adopt short duration varieties - Maintain closer spacing - Adopt intercropping with soyabean and maize	
		Soybean	No change	- Mulching with locally available biomass - Intercropping with other beans - Application of organic manure before sowing.	
	Very steep sloping hills with shallow sandy loam soils (1500-3500m MSL)	Maize	No change Short duration varieties like RCM-1-75, RCM-1-76, All-rounder	- Planting across slope - Adopt mulching with locally available mulch - Summer ploughing to conserve moisture - Maize + groundnut/soya bean/rajma intercropping. - Hydropriming/ seed soaking in water for 24hr and followed by shade drying before sowing. - Application of FYM/organic manure before sowing.	
		Millets	Short duration varieties of finger millet (VR-708, GPU-67)	- Planting across slope - Application of FYM/organic manure before sowing. - Summer ploughing to conserve moisture	

Contingency measures- Mid season

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2	Major Farming situation	Normal Crop /cropping system	Crop management	Soil nutrient & moisture	Remarks on Implementation

weeks rainless (>2.5 mm)period)				conservation measures	
Vegetative stage	Moderately steep sloping hills with deep loamy soils (200-800 m MSL)	Maize	▪ Weeding ▪ Thinning of more sensitive intercrop ▪ Intercultural operations ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching with locally available material	Schemes from Line Deptt. /RKVY/ATMA
		Millet (finger millet)	▪ Weeding ▪ Interculture ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching of locally available material	
		Vegetable crops (Tomato, chilli)	▪ Proper rouging ▪ Intercultural operations ▪ IPM measures	▪ Provide irrigation from the available sources ▪ Prefer Drip/sprinkler irrigation	Protected cultivation to be promoted/ Schemes from Line Deptt. /RKVY/ATMA
		Rajma	▪ Interculture operations ▪ Application of organic manure/ FYM ▪ Proper weed management	▪ Provide irrigation from any available sources ▪ Mulching with local bio-mass	
		Soybean	▪ Interculture operations ▪ Application of organic manure/ FYM ▪ Proper weed management	▪ Provide irrigation from any available sources ▪ Mulching with local bio-mass	
	Steep sloping deep loamy soils (800- 1500m MSL)	Maize	▪ Weeding ▪ Interculture ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching of locally available material	
		Millet	▪ Weeding ▪ Interculture ▪ Foliar application of 1% MOP	▪ Provide irrigation from the available sources ▪ Mulching of locally available material	
		Vegetable (tomato, chilli)	▪ Proper rouging ▪ Intercultural operations ▪ IPM measures	▪ Provide irrigation from the available sources ▪ Prefer Drip/sprinkler irrigation	Protected cultivation to be promoted/ Schemes from Line Deptt. /RKVY/ATMA

		Rajma	- Interculture operations - Application of organic manure/ FYM - Proper weed management	- Provide irrigation from any available sources - Mulching with local bio-mass	
		Soybean	- Interculture operations - Application of organic manure/ FYM - Proper weed management	- Provide irrigation from any available sources - Mulching with local bio-mass	
	Very steep sloping hills with shallow sandy loam soils (1500-3500m MSL)	Maize	- Weeding - Interculture - Foliar application of 1% MOP	- Provide irrigation from available sources - Mulching of locally available material	Schemes from Line Deptt. /RKVY/ATMA
		Millet	- Weeding - Interculture operations - Foliar application of 1% MOP	- Provide irrigation from available sources - Mulching of locally available material	
Reproductive stage	Moderately steep sloping hills with deep loamy soils (200-800 m MSL)	Maize	- Weeding - Intercultural operations - Foliar application of 1% MOP	- Provide irrigation from available sources - Mulching of locally available material	Line departments schemes/ATMA/RKVY
		Millet (finger millet)	- Ratooning - Weeding - Intercultural operations - Foliar application of 1% MOP	- Provide irrigation from available sources - Mulching of locally available material	
		Vegetable crops (Tomato, chilli)	- Proper rouging - Intercultural operations - IPM measures	- Provide irrigation from the available sources - Prefer Drip/sprinkler irrigation	Protected cultivation should be promoted
		Rajma	- Interculture operations - Proper weed management - IPM measures	- Provide irrigation from any available sources - Mulching with local bio-mass	
		Soybean	Interculture operations	Provide irrigation from	

			- Proper weed management - IPM measures	- any available sources - Mulching with local bio-mass	
	Steep sloping deep loamy soils (800-1500m MSL)	Maize	- Weeding - Intercultural operations - Foliar application of 1% MOP	- Provide irrigation from available sources - Mulching of locally available material	Line departments schemes/ATMA/RKVY
		Millet (finger millet)	- Ratooning - Weeding - Intercultural operations - Foliar application of 1% MOP	- Provide irrigation from available sources - Mulching of locally available material	
		Vegetable crops (Tomato, chilli)	- Proper rouging - Intercultural operations - IPM measures	- Provide irrigation from available sources - Prefer Drip/sprinkler irrigation	Protected cultivation should be promoted
		Rajma	- Interculture operations - Proper weed management - IPM measures	- Provide irrigation from any available sources - Mulching with local bio-mass	
		Soyabean	- Interculture operations - Proper weed management - IPM measures	- Provide irrigation from any available sources - Mulching with local bio-mass	
	Very steep sloping hills with shallow sandy loam soils (1500-3500m MSL)	Maize	- Weeding - Intercultural operations - Foliar application of 1% MOP	- Provide irrigation from available sources - Mulching of locally available material	Line departments schemes/ATMA/RKVY
		Millet	- Ratooning - Weeding - Intercultural operations - Foliar application of 1% MOP	- Provide irrigation from available sources - Mulching of locally available material	

Contingency measures- End of the season

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Moderately steep sloping hills with deep loamy soils (200-800 m MSL)	Maize	- Harvesting at physiological maturity for fodder purpose - Re-sowing for fodder purpose	Planning of Pulses like pea, oilseeds like toria, and winter grains like wheat and buckwheat, cole crops	Schemes from Line Deptt./RKVY/ATMA
		Finger millet	Harvest at physiological maturity.	- Planning for zero tillage cultivation of pea, toria etc. - Preparation for cole crops	
		Rajma	Harvest at physiological maturity.	Planning for early planting of cole crops (cabbage, cauliflower)	
		Vegetables (tomato, chilli)	Harvest at physiological maturity.	Planning for early planting of cole crops (cabbage, cauliflower)	
		Soyabean	Harvest at physiological maturity.	Planning for early planting of cole crops (cabbage, cauliflower)	
	Steep sloping deep loamy soils (800-1500m MSL)	Maize	- Harvesting at physiological maturity for fodder purpose - Re-sowing for fodder purpose	Planning of Pulses like pea, oilseeds like toria, and winter grains like wheat and buckwheat, cole crops	Schemes from Line Deptt./RKVY/ATMA
		Finger millet	Harvest at physiological maturity.	- Planning for zero tillage cultivation of pea, toria etc. - Preparation for cole crops	
		Rajma	Harvest at physiological maturity.	Planning for early planting of cole crops (cabbage, cauliflower)	
		Vegetables (tomato, chilli)	Harvest at physiological maturity.	Planning for early planting of cole crops (cabbage, cauliflower)	
		Soyabean	Harvest at physiological maturity.	Planning for early planting of cole crops (cabbage, cauliflower)	
	Very steep sloping hills with shallow sandy loam soils (1500-3500m MSL)	Maize	- Harvesting at physiological maturity for fodder purpose - Re-sowing for fodder purpose	Planning of Pulses like pea, oilseeds like toria, and winter grains like wheat and buckwheat, cole crops	Schemes from Line Deptt./RKVY/ATMA

		Millet	▪ Harvest at physiological maturity.	▪ Planning for zero tillage cultivation of pea, toria etc. ▪ Preparation for cole crops	
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Resource management technologies

24. Construction and renovation of low cost water harvesting structure Jalkunds for providing supplemental irrigations to *rabi* crops and during dry spells to produce higher yields
25. Lifesaving irrigation to rabi crops from Jalkund and natural stream to get more crop yield
26. Low cost vermicompost unit to enhance the soil fertility and also increase the moisture holding capacity of the soil
27. Green manuring (Dhaincha) to enhance the soil fertility
28. Bio-mulching and bio degradable plastic to conserve moisture, obtain higher yield in cash crops
29. Organic mulching in pea (Chakra) to conserve moisture and increase crop yield
30. Location specific intercropping systems of potato + pea, maize + black gram to increase the cropping intensification thereby increasing crop yield
31. Zero tillage in pea to conserve soil moisture thereby increase crop yield