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# FAO Drought AA Trigger: Early Warning and Monitoring

## February 2024



Anticipatory Action Team

*FAO Pakistan*



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# An Introduction to Anticipatory Actions and Shock Responsive Social Protection





# Defining Anticipatory Action

- **It's not totally new!** You may already be doing Anticipatory Action ahead of shocks (i.e. early warning communications ahead a flood or delaying rice planting on a dry spell forecast).
- Have you heard of Early Warning Early Action or Forecast-based Financing? They **mean the same thing** as Anticipatory Action!
- As of early 2020, shift towards Anticipatory Action as the main term.
- Simple definition: *Anticipatory Action is an innovative approach which systematically links forecast information to actions (and financing) designed to protect families, their assets and livelihoods, ahead of a hazard.*



# Anticipatory Action and Shock Responsive Social Protection

## BACKGROUND

## (AA-SRSP)

**Anticipatory Action (AA)** is an innovative mechanism that aims to trigger pre-agreed early actions with pre-approved financing when science-based forecasts reach a pre-defined impact threshold by releasing funding in anticipation of a crisis.

**Shock-responsive social protection (SRSP)** is a term used to bring focus on shocks that affect a large proportion of the population simultaneously (covariate shocks). It encompasses adapting routine social protection programmes and systems to cope with changes in context and demand following large-scale shocks.



## FAO Anticipatory Action Approach

FAO advocates for a faster, more effective humanitarian system by shifting from disaster response to anticipation.

**Anticipatory Action** is driving a change in the way humanitarian and development actors are approaching predictable crises. The fact is, increasingly, we can predict disasters. Thanks to technological advances, early warning information is more accurate and readily available than ever before. These gains also come with the responsibility to act on them.

FAO has been [a long-time advocate of anticipatory interventions](#). It is one of the agencies spearheading the global paradigm shift towards **more proactive approaches to predictable shocks**, be they typhoons, droughts, the consequence of conflicts or economic crises.



# Key characteristics of Anticipatory Action



Time bound



- AA occurs between warning and disaster
- Flood – could be between 3 – 7 days
- Drought – Could be up to 3 – 8 months in advance



Protective Intent



- Protective intent is based on knowledge of past disaster impacts
- AA intends to avert damage and protect people and assets, not respond to needs developed post-disaster



Pre-agreed and risk  
informed triggers



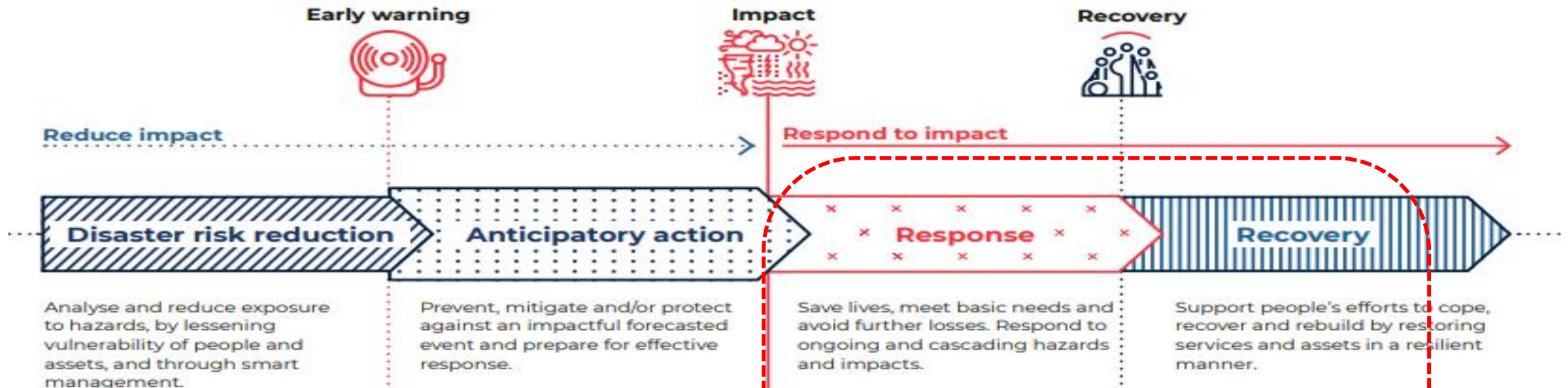
- AA systems need a threshold or trigger to decide when to act
- Could be when a certain level of alert is reached within EWS
- ‘Soft’ to fully automated triggers



## How it all works?

- Anticipatory action means making smart, effective, and proactive investments that soften the blow of disasters. To make this possible, every anticipatory action system, no matter the context, is built with 5 key ingredients:
- **Crisis timelines:** A tool to help understand the usual evolution of a hazard and its relative impacts on livelihoods.
- **Early warnings:** A set of pre-selected, context-specific information points that are monitored to predict a crisis and to trigger action when a warning threshold is crossed.
- **Anticipatory actions:** Early, short-term disaster management interventions implemented as soon as a warning trigger is reached to prevent or mitigate the impact of a hazard.
- **Flexible financing:** Pre-identified resources to enable rapid action when warning triggers are reached. One example of flexible financing is FAO's Special Fund for Emergency and Rehabilitation Activities (SFERA) Anticipatory Action Window.
- **Evidence from the ground:** Impact analyses, beneficiary interviews and return-on-investment studies that allow FAO and others to document, improve, and learn from anticipatory actions.





**Routine social protection for reducing poverty and vulnerability**

orderly transitions from early anticipatory action to response and recovery.

Source: Anticipation Hub (IFRC, Ge...

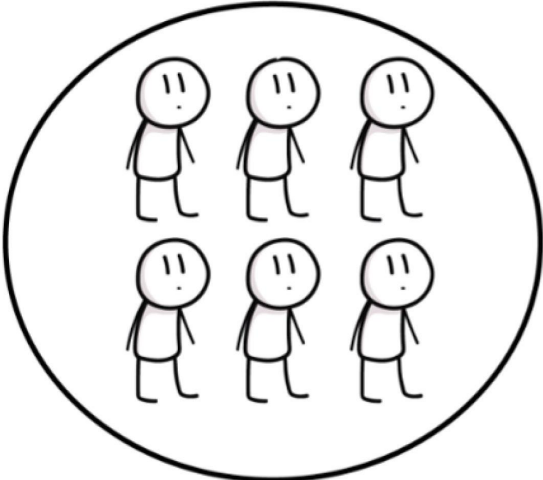
**AA activities via social protection**

mate Centre)

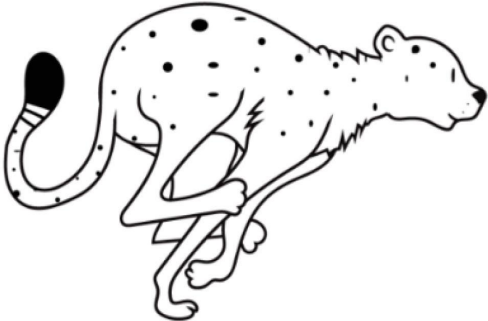
**Shock-responsive social protection scale-ups and expansions**

# What are the six criteria of effective Shock-Responsive Social Protection Systems?

**Cover those in need**

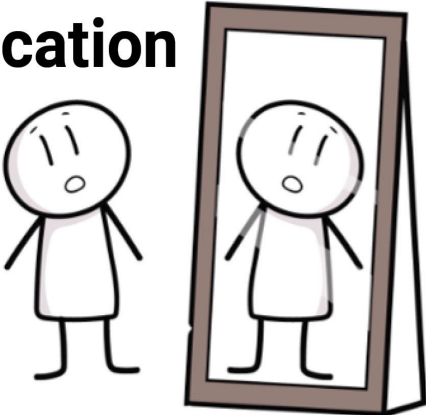


**Be quicker!**

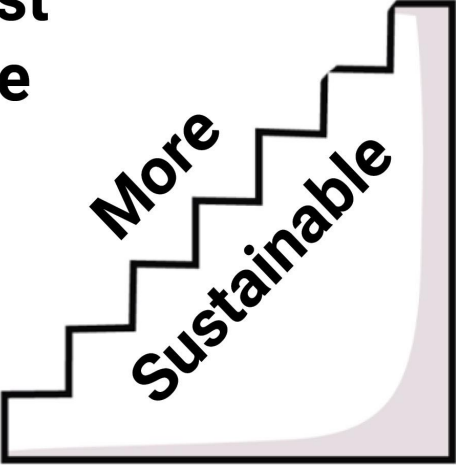


**More predictable**

**Less duplication**



**More cost effective**





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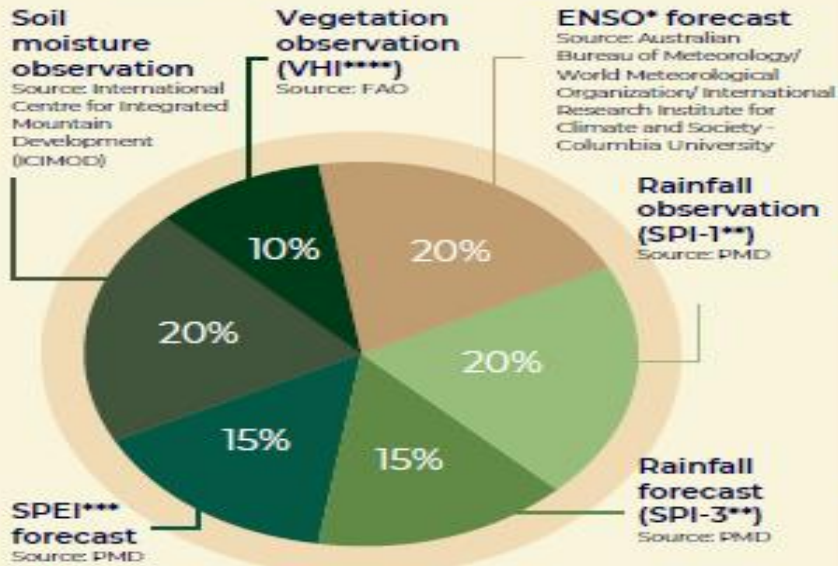
# **Drought Early Warning System for Tharparkar , Umerkot and Dadu**



## Early Warning System and Trigger Points

### Combined Drought Index (CDI)

A combination of the below indicators with their respective thresholds is used for activating anticipatory actions.



Total: 100%

Weighting will be used to calculate this index.

\*El Niño-Southern Oscillation

\*\*Standardized Precipitation Index

\*\*\*Standardized Precipitation Evapotranspiration Index

\*\*\*\*Vegetation Health Index

Above 70% of CDI in at least 2 districts

and/or if there is a declaration of drought at the provincial level



#### Phase 1

- If the CDI passes 70% in at least 2 districts, start phase 1 actions
- Conduct field assessments and review indicators to inform phase 2 activation.



#### Phase 2

- If the CDI passes 70% in at least two districts, start phase 2 anticipatory actions
- Call for a coordination meeting to confirm the activation of phase 3.

Monitor groundwater observation (where available)

Monitor the Agriculture Stress Index and temperature forecasts

#### Phase 3

- If the CDI is above 70% and/or there is a declaration of drought at the provincial level, start implementing phase 3 anticipatory actions
- Coordinate with the government for further analysis of the evolving situation.

May

July

Sep

Dec

## Drought Early Warning System Monthly Monitoring Tool

### Drought Early Warning System Monthly Monitoring Tool for January 05, 2024

Indicator Group	N.	Indicator	Source	Threshold(s)	Source Link	Indicators, 0 or 0.5, or 1	% Weight of available indicators
Meteorological	1	ENSO (Forecast)	IRI	Use value=0 if neutral, 0.5 if at alert level and 1 if declared	<a href="http://www.bom.gov.au/climate/ensoutlook/">http://www.bom.gov.au/climate/ensoutlook/</a>	1	20%
	2	Rainfall Observation (SPI-1)	PMD	Value=0 if observed SPI-1 is positive, 0.5 if it is between 0 and -0.5, then 1 if below -0.5	<a href="https://ndmc.pmd.gov.pk/new/bulletins.php">https://ndmc.pmd.gov.pk/new/bulletins.php</a>	1	20%
	3	Rainfall Forecast (SPI-3)	PMD, ICIMOD	Value=0 if forecasted SPI-3 is positive, 0.5 if it is between 0 and -1, then 1 if below -1	<a href="http://tethys.icimod.org/apps/droughtpk/seasonal/?d=12/slamabad&amp;p=mm&amp;y=2023&amp;sd=3&amp;ed=6&amp;i=rain_evap_soilMoist.tempExtreme">http://tethys.icimod.org/apps/droughtpk/seasonal/?d=12/slamabad&amp;p=mm&amp;y=2023&amp;sd=3&amp;ed=6&amp;i=rain_evap_soilMoist.tempExtreme</a>	0	15%
	4	Rainfall and temp Forecast SPEI3	ICIMOD	Value=0 if forecasted SPEI3 is positive, 0.5 if it is between 0 and -0.5, then 1 if it is below -0.5	<a href="https://spei.csic.es/map/maps.html#months=2#month=0#year=2023">https://spei.csic.es/map/maps.html#months=2#month=0#year=2023</a>	1	15%
Agro-Meteorological	5	Soil Moisture Observation	Copernicus	Value=0 if SM is normal or above normal, 0.5 if it is between 0 and 20% below normal, then 1 if it is more than 20% below normal	<a href="https://ndmc.pmd.gov.pk/new/outlooks.php?p=soil-moisture-anomaly">https://ndmc.pmd.gov.pk/new/outlooks.php?p=soil-moisture-anomaly</a>	0	20%
Agricultural	6	Vegetation Health Index Observation (VHI)	Copernicus, GIEWS PMD	Is the map showing moderate sized areas with VHI anomaly ( $\leq 0.35$ )	<a href="https://www.fao.org/giews/earthobservation/country/index.jsp?lang=en&amp;type=21&amp;code=PAK">https://www.fao.org/giews/earthobservation/country/index.jsp?lang=en&amp;type=21&amp;code=PAK</a>	0	10%





July 2023

**DEWS score: 35% - moderate drought risk.**

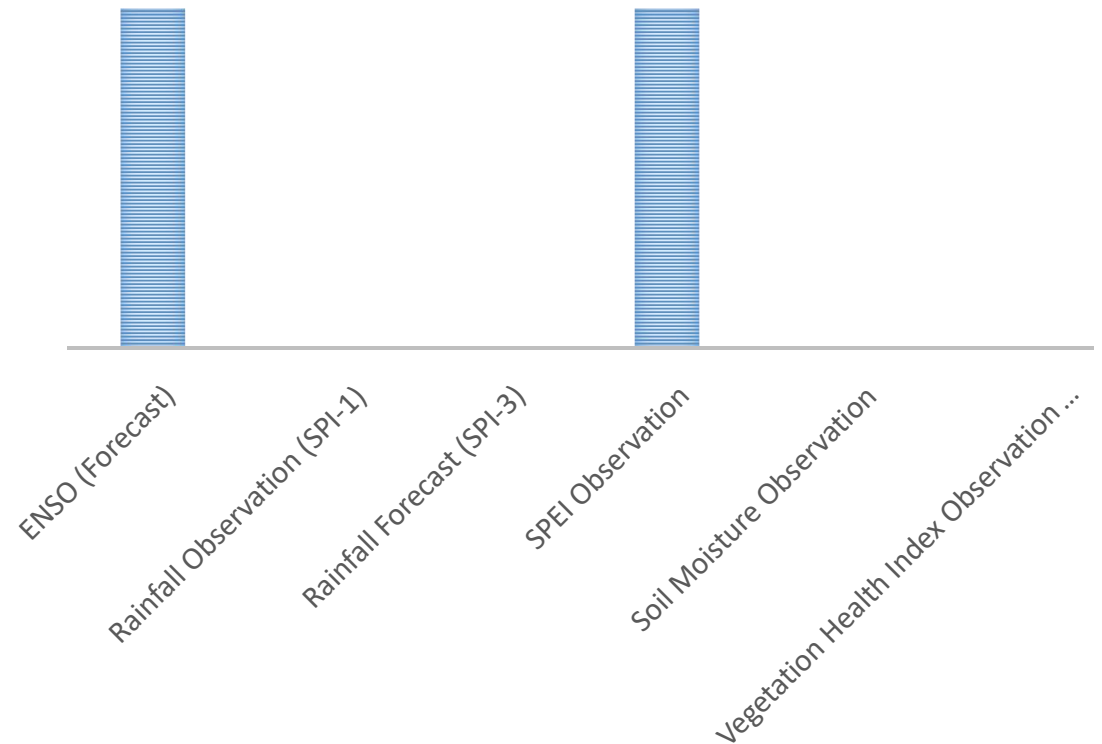
**El Niño conditions present.**

**Rainfall and temperature forecast SPEI3 (standardized precipitation evapotranspiration index) indicated below-normal conditions.**

**Other indicators remained normal or above-normal.**

**Recommendation: Continued monitoring and potential implementation of mitigation measures.**

## DEWS SCORE STANDS AT 35%

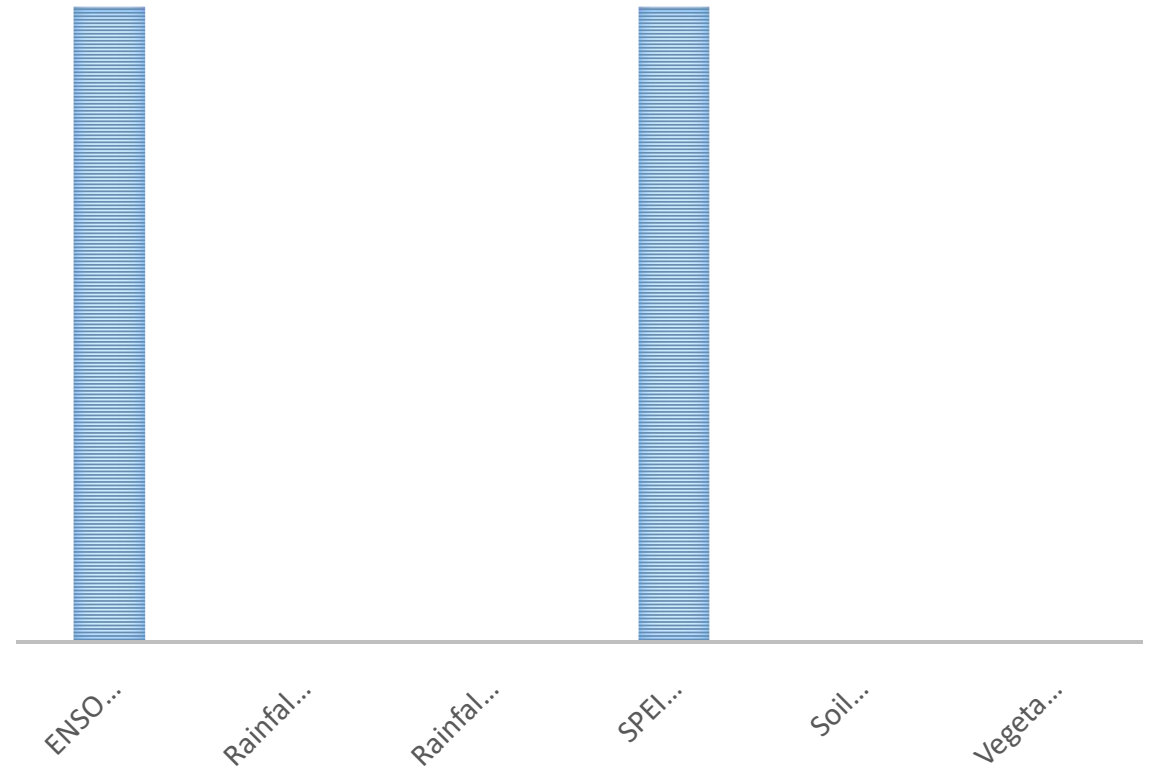
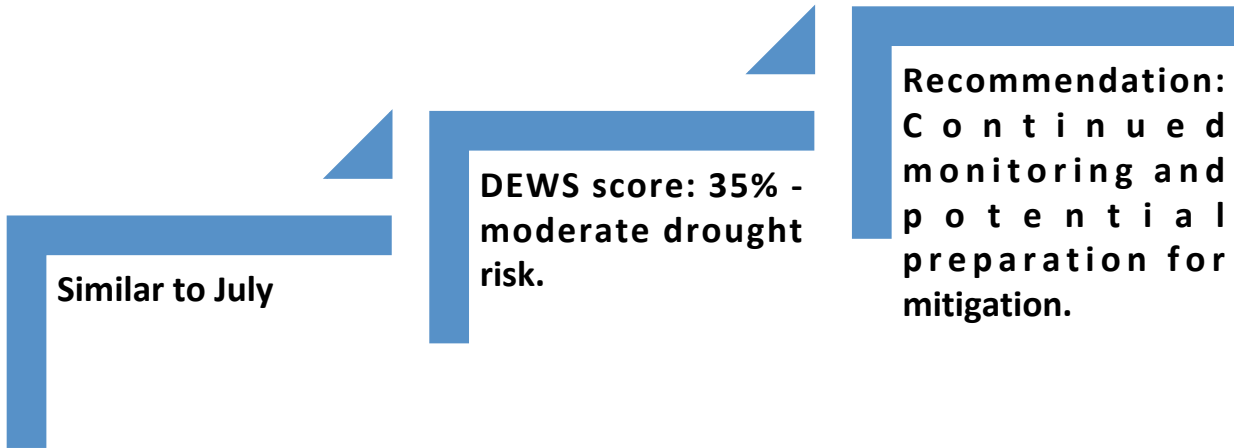




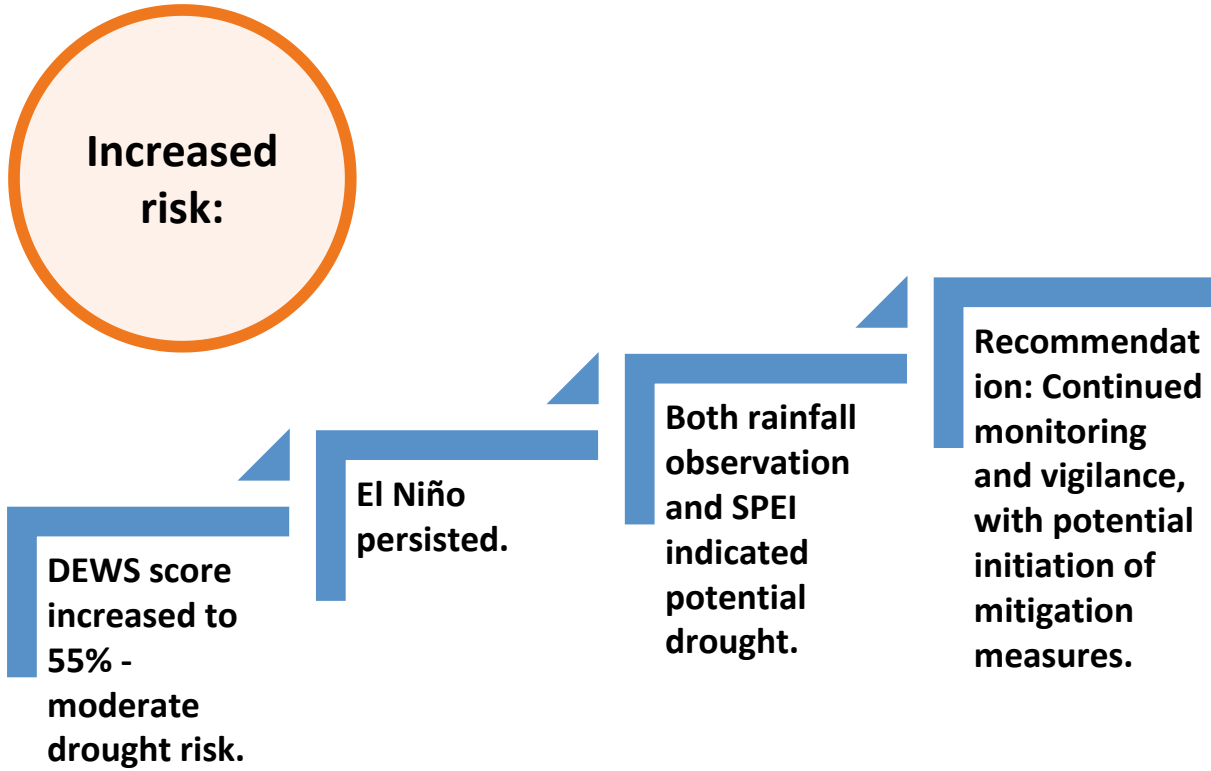


August 2023

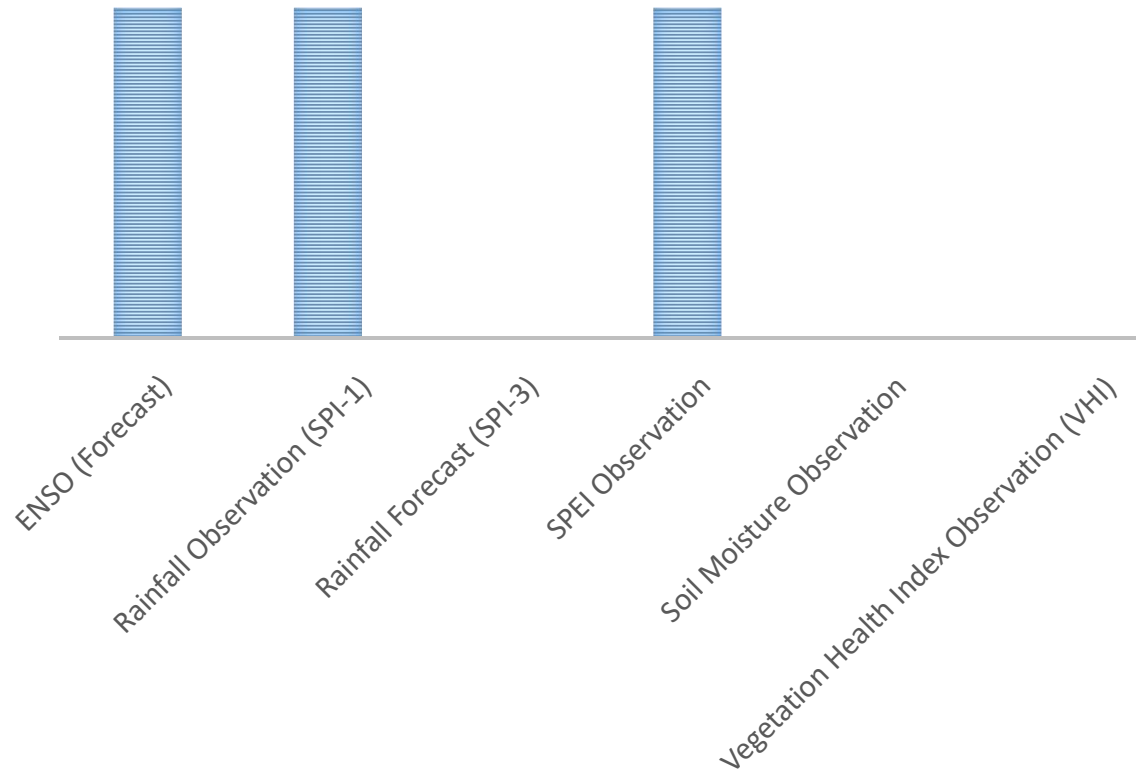
### DEWS SCORE STANDS AT 35%



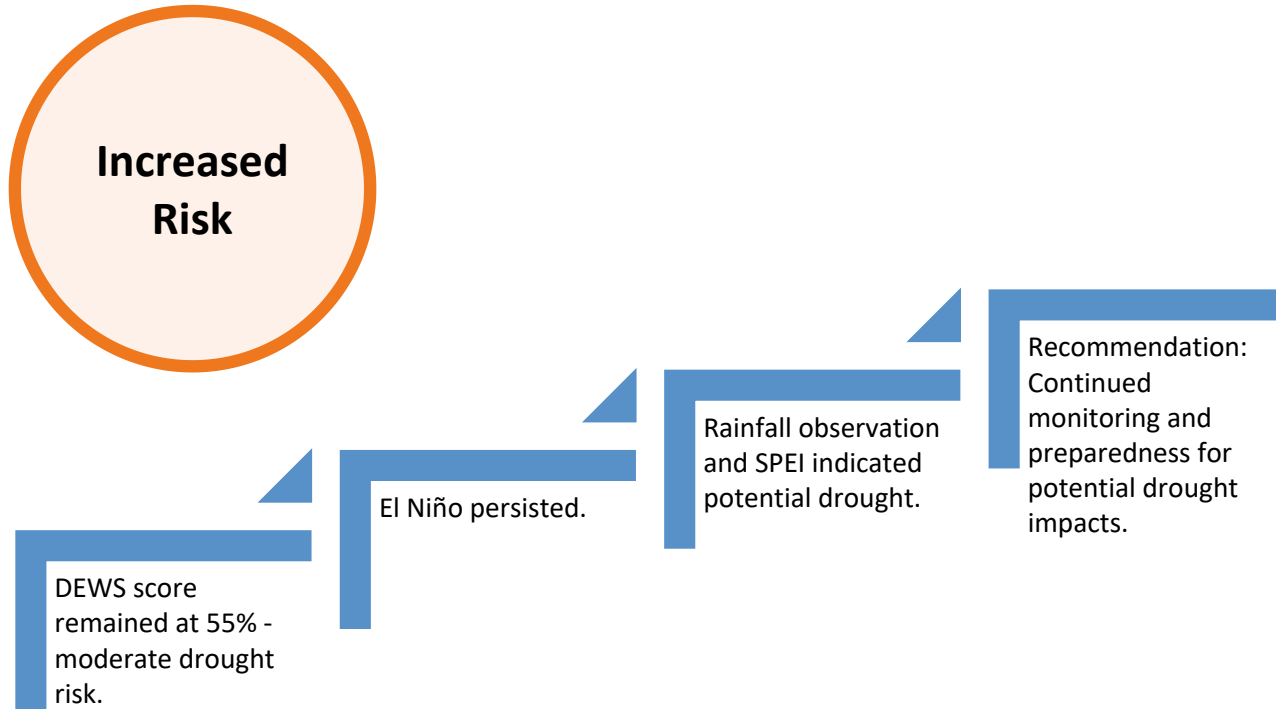
September 2023



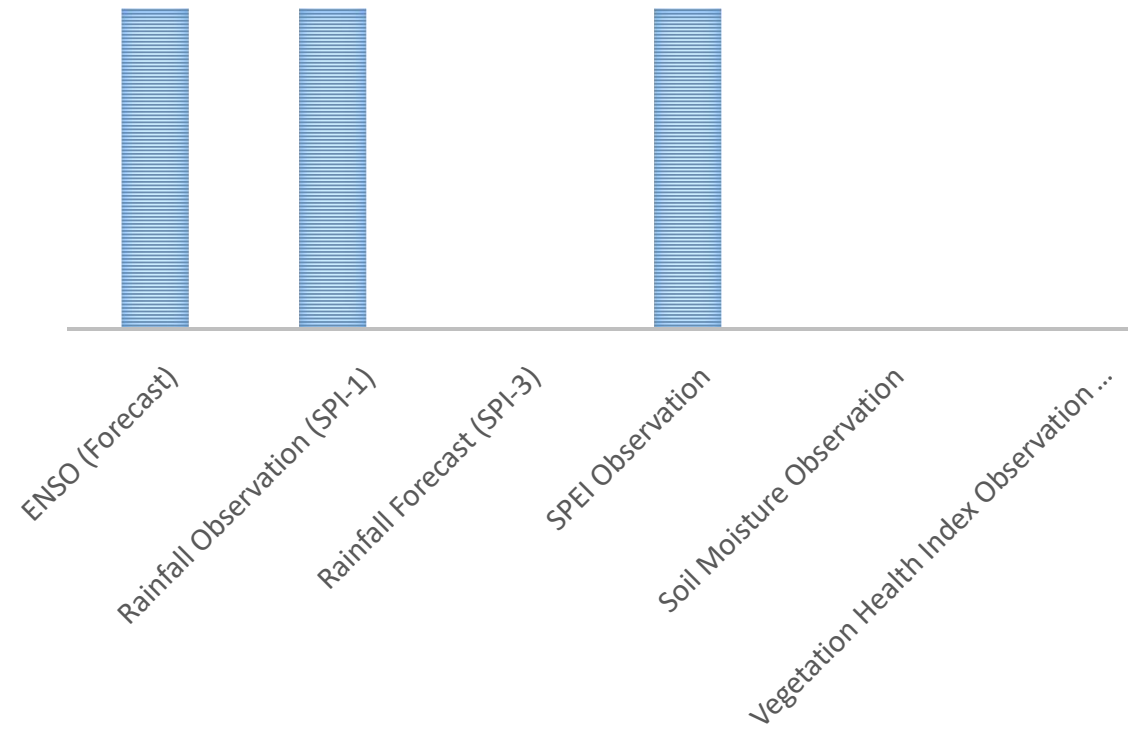
## DEWS SCORE STANDS AT 55%. ENSO DECLARED



October 2023



## DEWS SCORE STANDS AT 55%. ENSO DECLARED



November 2023

## Reduced Drought Risk

DEWS score  
significantly  
decreased to 20%

Improved situation

El Niño persisted  
but other  
indicators mostly  
normal or above-  
normal.

Recommendation:  
Continued  
monitoring and  
preparedness, but  
with less urgency.

## DEWS SCORE STANDS AT 20%. ENSO DECLARED



December 2023

## Mixed Picture Again

DEWS score  
increased  
to 35% -  
moderate  
drought  
risk.

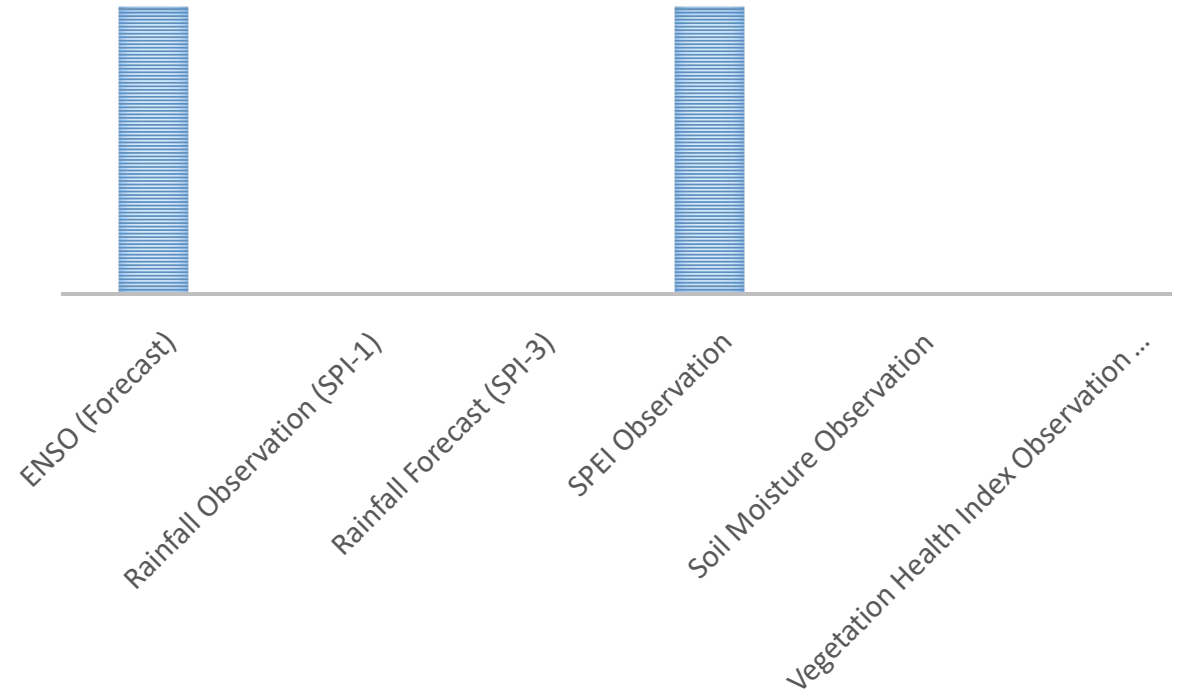
El Niño  
persisted.

Rainfall  
observation  
and soil  
moisture  
remained  
normal.

SPEI  
Observation  
indicated  
potential  
drought  
risk.

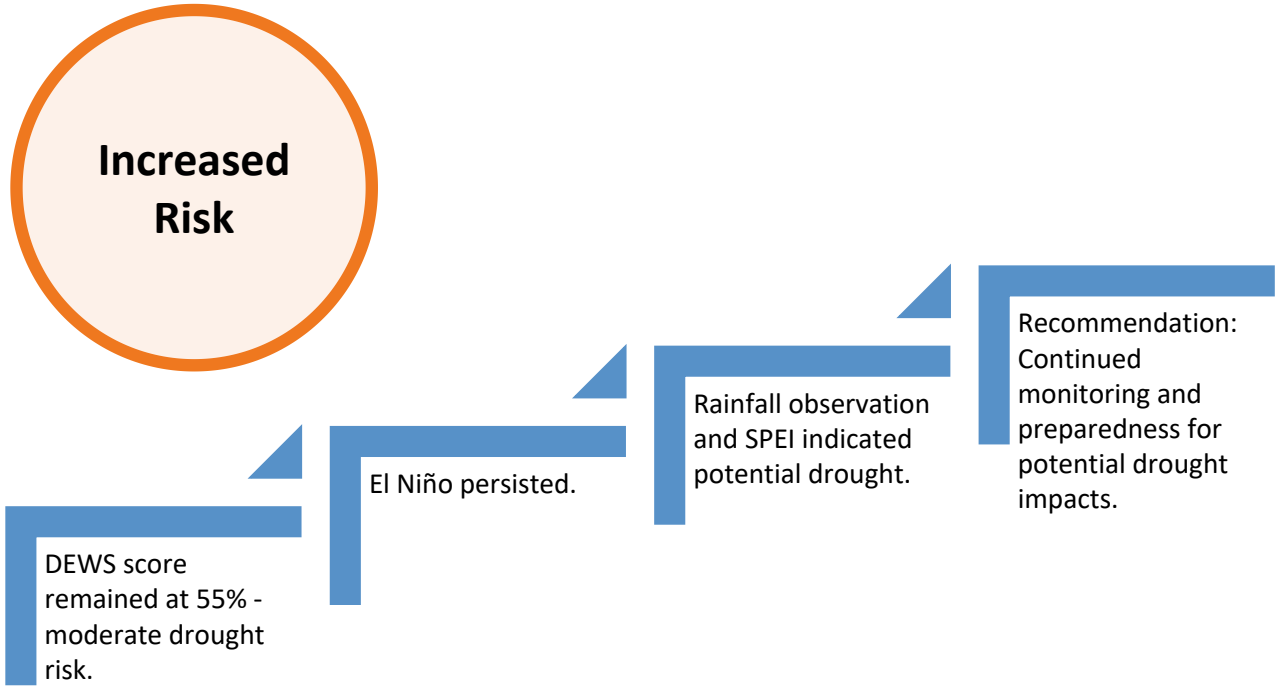
Recommendation:  
Continued  
monitoring  
and  
vigilance,  
with  
potential  
preparation  
for  
mitigation  
measures.

## DEWS SCORE STANDS AT 35%.

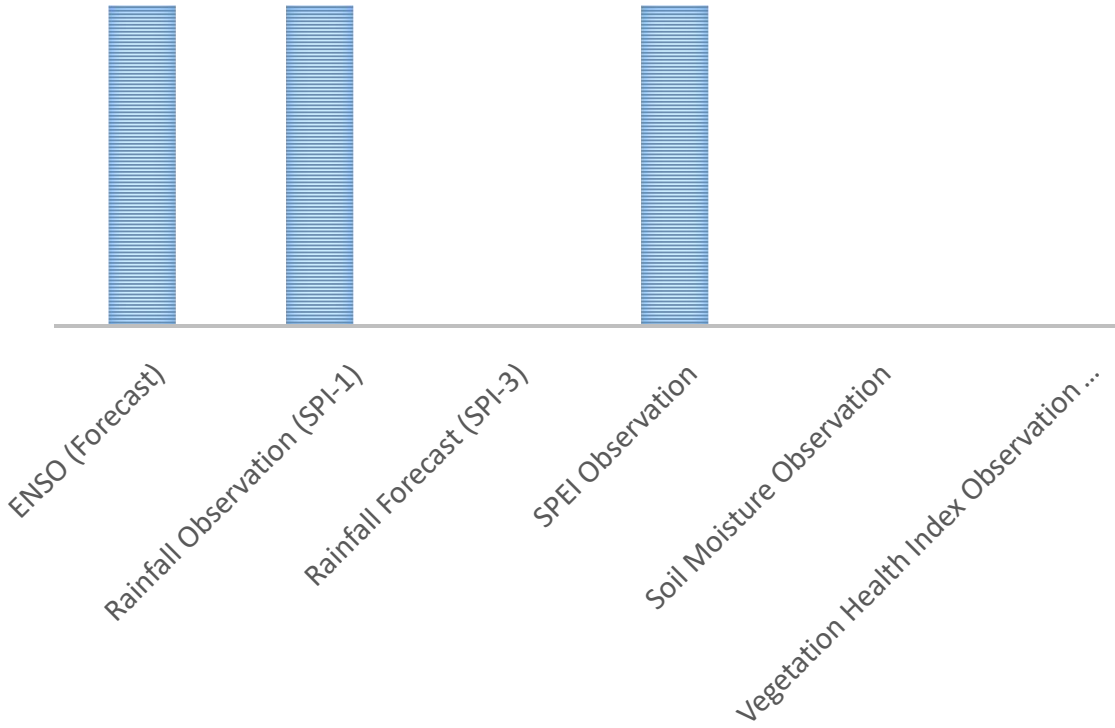




January 2024



### DEWS SCORE STANDS AT 55%. ENSO DECLARED





February 2024



Increased  
Risk

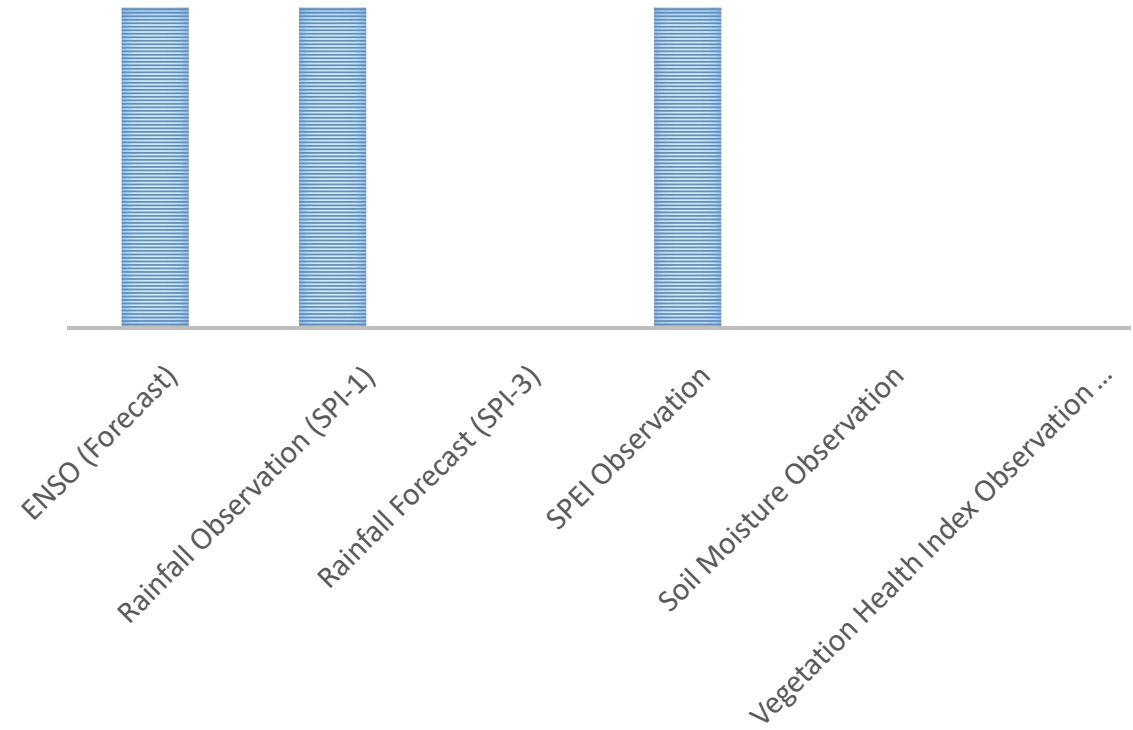
DEWS score  
remained at 55% -  
moderate drought  
risk.

El Niño persisted.

Rainfall observation  
and SPEI indicated  
potential drought.

Recommendation:  
Continued  
monitoring and  
preparedness for  
potential drought  
impacts.

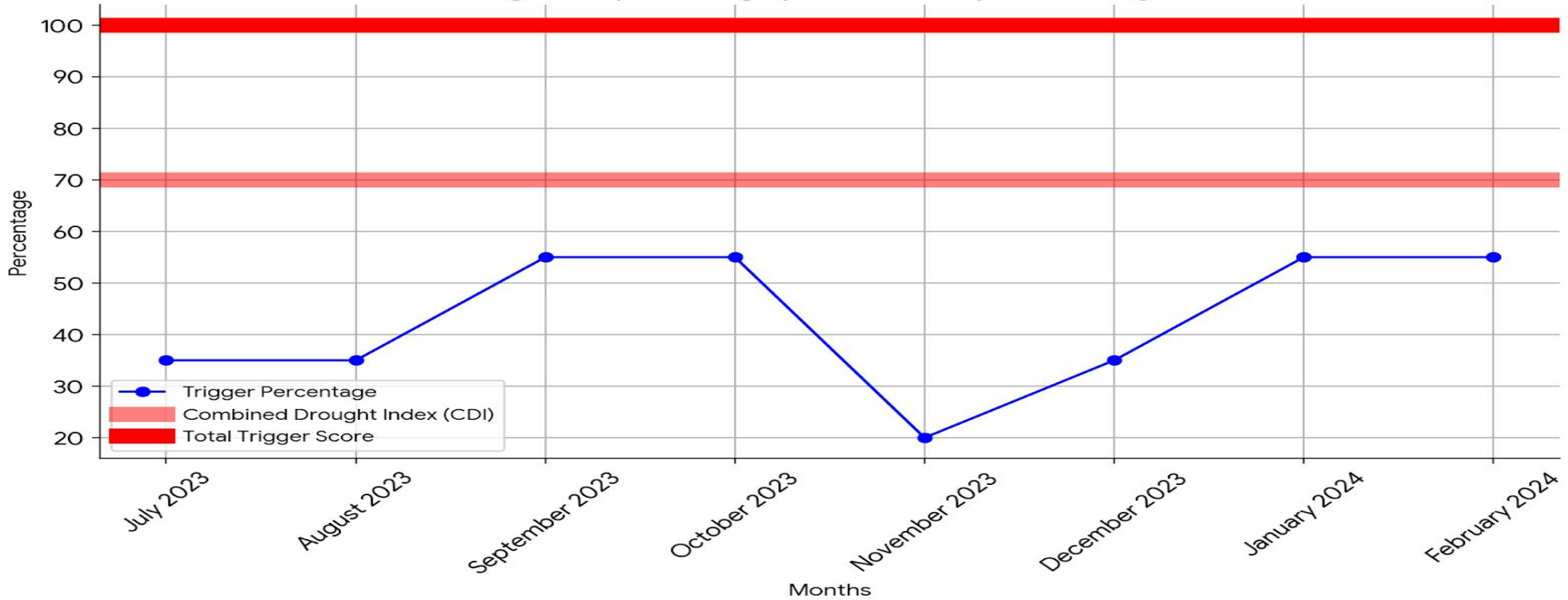
## DEWS SCORE STANDS AT 55%. ENSO DECLARED



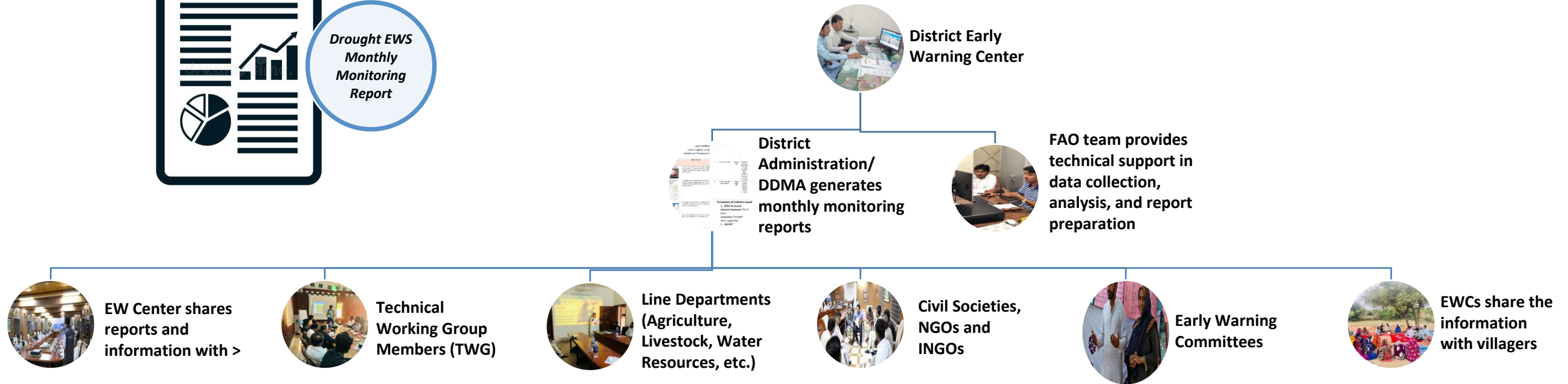
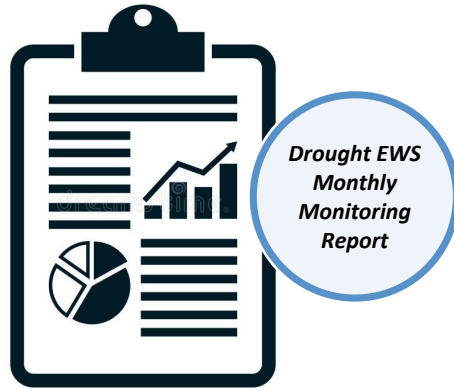


## Monitoring Months: July 2023 to February 2024

### Drought Early Warning System Monthly Monitoring Tool



## Information Dissemination Mechanisms for Mitigating Drought Risks





## Recommendations:

- Continue monitoring key indicators such as rainfall, soil moisture, and vegetation health.
- Develop and update contingency plans for drought mitigation.
- Raise awareness among stakeholders and encourage water conservation practices.
- Implement drought-tolerant agricultural practices and water-saving irrigation techniques.
- Utilize existing social protection systems to provide cash grants and support to vulnerable communities.

## Next Steps:

We will continue to monitor the situation closely and provide updates as necessary.



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## **Riverine Flood Early Warning System for Dadu**



## Flood Early Warning Trigger Mechanism for Dadu Sindh

### Alert Phase

Threshold	Lead time	Source	Actions
Model shows intense (high) to very high rainfall (4mm to 8mm per hour or 50 mm in 24 Hours) in the upper catchments	7 days	<a href="https://nwfc.pmd.gov.pk/new/weekly-outlook-en.php">https://nwfc.pmd.gov.pk/new/weekly-outlook-en.php</a> ; <a href="https://smrfc.pmd.gov.pk/">https://smrfc.pmd.gov.pk/</a> <a href="https://ffd.pmd.gov.pk/bulletin/C">https://ffd.pmd.gov.pk/bulletin/C</a>	Implementation of Agreed phase I anticipatory actions
Significant weather events and observed rainfall (4mm to 8mm per hour or 50 mm in 24 Hours) in the upper catchments between the Tunsana and Gudo	7.5 to 8 Days	<a href="https://smrfc.pmd.gov.pk/">https://smrfc.pmd.gov.pk/</a> <a href="https://ffd.pmd.gov.pk/bulletin/A">https://ffd.pmd.gov.pk/bulletin/A</a>	
high to very high floods (0.5 million to 0.65 million cusecs below Tarbela to reach Guddu (Outflow)	7.5 to 8 days	<a href="https://ffd.pmd.gov.pk/ffd_limits/floodlimits.htm">https://ffd.pmd.gov.pk/ffd_limits/floodlimits.htm</a> <a href="https://ffd.pmd.gov.pk/ffd_rmodel/floodroutingmap.png">https://ffd.pmd.gov.pk/ffd_rmodel/floodroutingmap.png</a>	

### Activation Phase

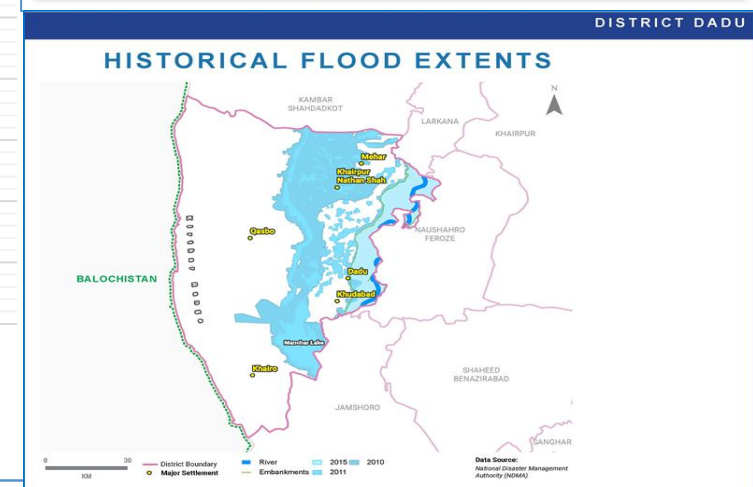
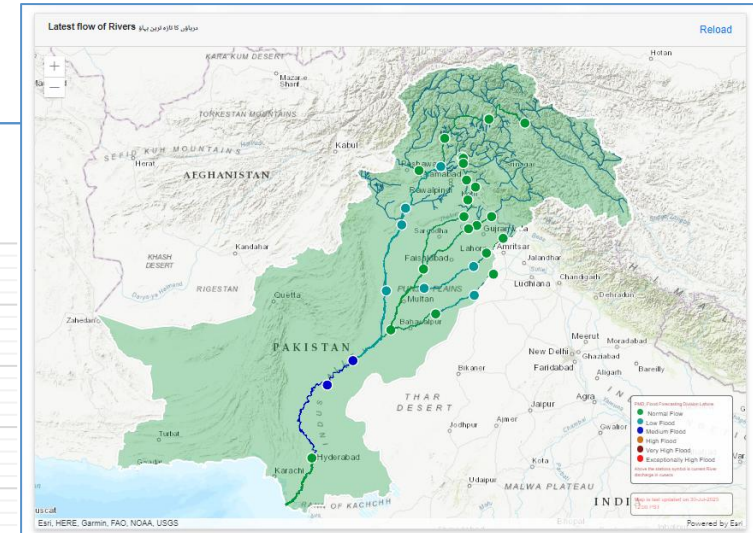
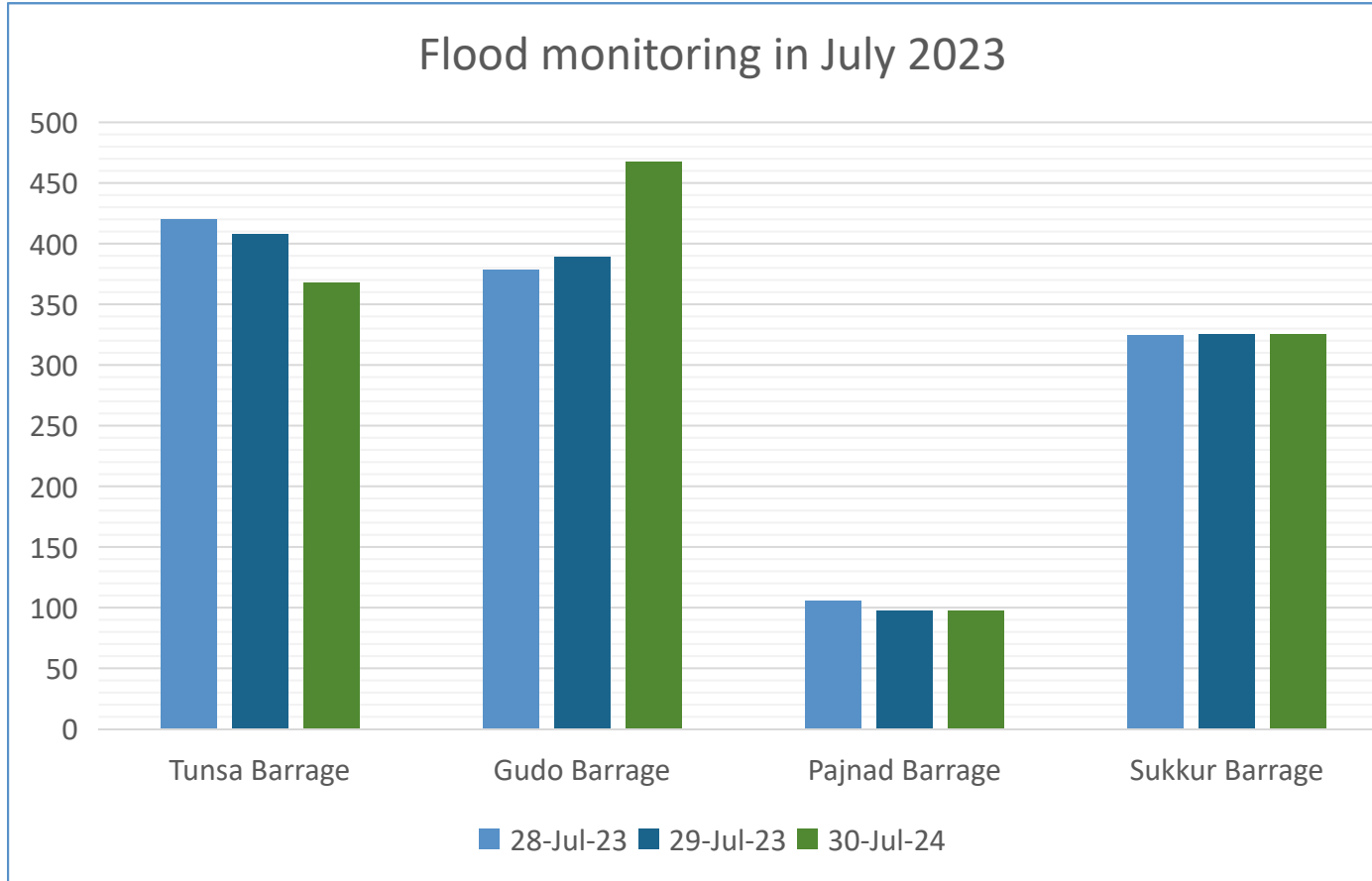
Threshold	Lead time	Source	Actions
Greater than 700,000 cusec. TUNSA	5-day lead time to reach from Taunsa to Sukkur Barrage	<a href="https://ffd.pmd.gov.pk/bulletin/B">https://ffd.pmd.gov.pk/bulletin/B</a>	Implementation of Agreed phase II anticipatory actions
greater than 900,000 cusecs or more for 3 days at Sukkur barrage	lead time 3- days to reach from Sukkur to Dadu	<a href="https://smrfc.pmd.gov.pk/">https://smrfc.pmd.gov.pk/</a> <a href="https://ffd.pmd.gov.pk/bulletin/A">https://ffd.pmd.gov.pk/bulletin/A</a> <a href="https://ffd.pmd.gov.pk/bulletin/B">https://ffd.pmd.gov.pk/bulletin/B</a> <a href="https://ffd.pmd.gov.pk/bulletin/C">https://ffd.pmd.gov.pk/bulletin/C</a> <a href="https://ffd.pmd.gov.pk/bulletin/Advisory">https://ffd.pmd.gov.pk/bulletin/Advisory</a>	
A breach in the Indus River embankments occurred on the right side, downstream of the Gudo Barrage, and upstream of the Sukkur Barrage when the water flow reported 0.9 cusecs or above at Gudo Barrage.	08 days	<a href="https://smrfc.pmd.gov.pk/">https://smrfc.pmd.gov.pk/</a> <a href="https://ffd.pmd.gov.pk/bulletin/A">https://ffd.pmd.gov.pk/bulletin/A</a> PDMA Sindh NDMA	





Sample : Flood monitoring ,FFD dashboard and Dadu's historical flood extents

Flood monitoring in July 2023





# THANK YOU