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Drought management Strategy for the Lower Mekong River Basin

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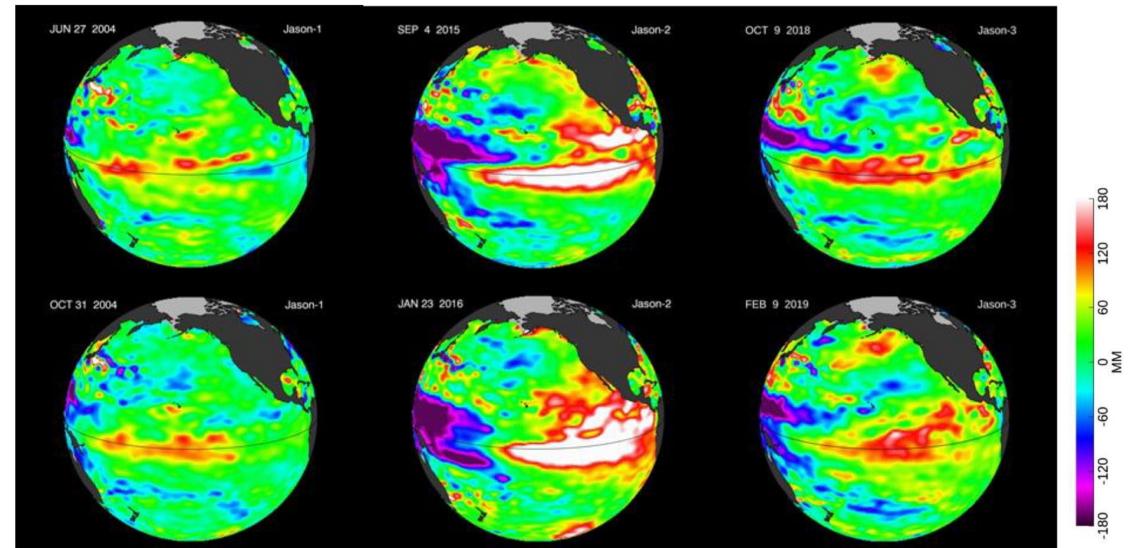
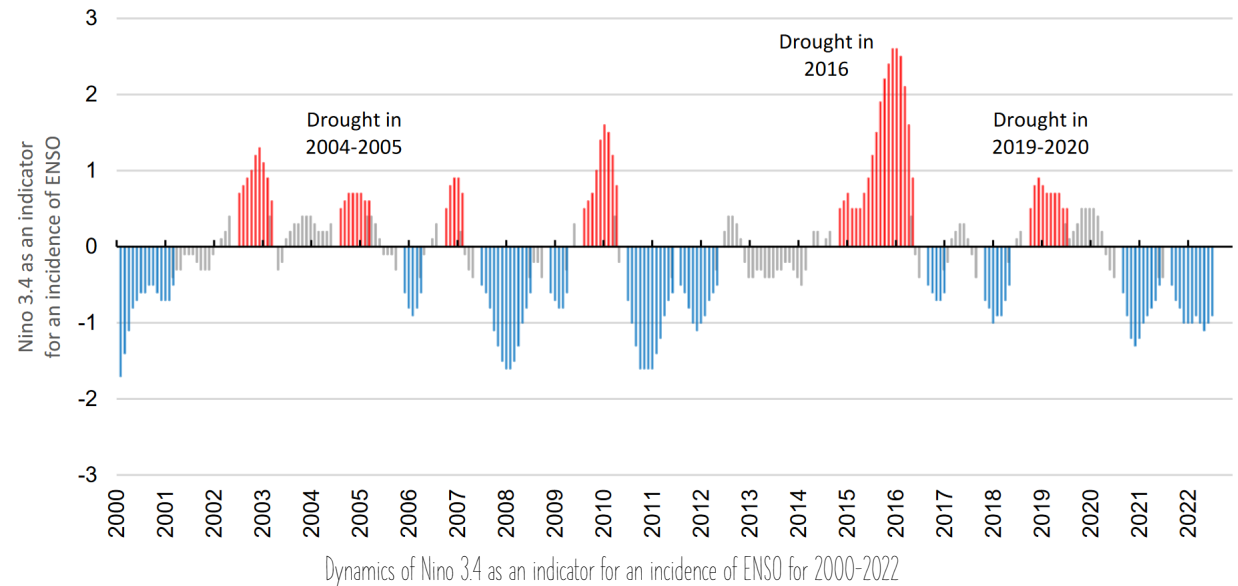
Introduction

- The Mekong is one of the world's largest rivers, ranking 12th in terms of **length at 4880 km** and 8th in terms of **mean annual discharge (flow) about 14,500 m³/s** (approximately 475 km³)
- **Catchment area of 795,000 km²** within the six countries of China and Myanmar as Upper Mekong Basin (UMB), **Lao PDR, Thailand, Cambodia and Viet Nam as Lower Mekong Basin (LMB).**
- **Mean annual rainfall** over the LMB is highly variable, ranging from **more than 3000 mm to less than 1000 mm.**
- The total **population** of the LMB is about **60 million**, about 85% lives in rural areas.
- The irrigation sector is the largest consumptive water user in the Basin with a total **irrigation area of 4 million hectares.**



Droughts in LMB

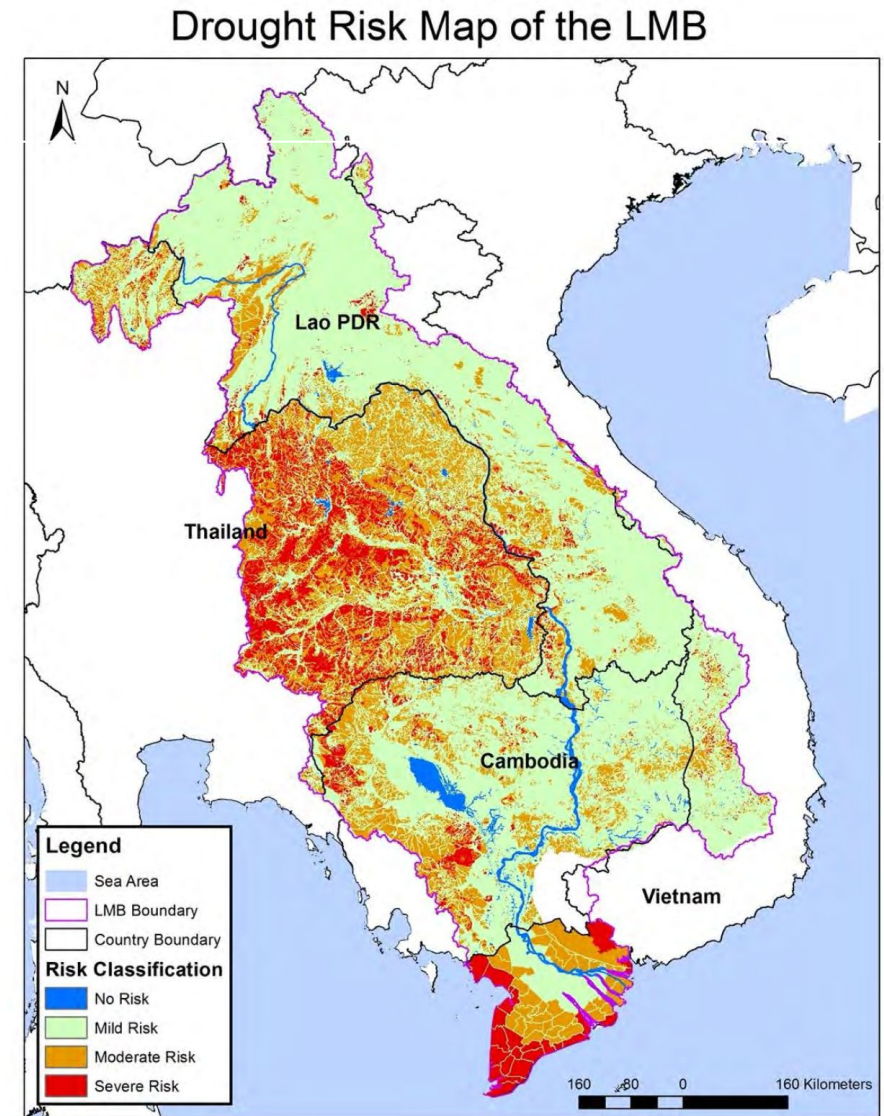
- **LMB experiences several droughts**, but recent decades there are droughts of 2004-2005, 2016, and 2019–2020.
- **The drought in 2016** has broken the 100-year historical record for Mekong water scarcity, high temperature and severe levels of salinity intrusion in the Mekong Delta.
- The **impacts brought serious economic losses** to LMB countries, particular in Thailand (approx. USD1.7 billion), to Viet Nam that more than 200,000 tons of rice were damaged, resulting in a loss of over USD 44.64 million to the Mekong Delta region.



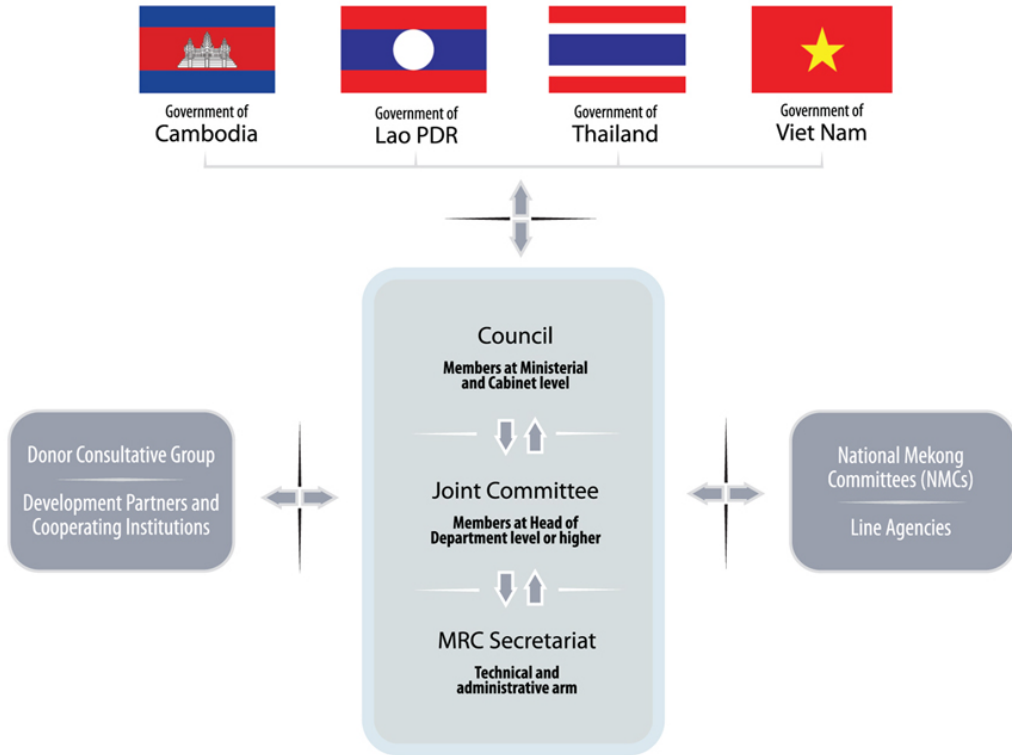
Comparisons of Pacific Ocean Sea surface height anomalies caused by the El Niño 2004-2005, El Niño 2015-2016 and El Niño 2018-2019

Drought as a transboundary issue

- The drought devastation in 2016 is an example of a **regional drought management issue that need an immediate measure and collaborating support from upstream countries** that are in control of water storage and regulation.
- Another convincing piece of evidence supporting drought as a **transboundary issue is the devastating level of salinity intrusions in the Mekong Delta**, which was due to insufficient rainwater from both Tonle Sap Lake and the upstream.
- **Development in the LMB will lead to increased water demands** in different sectors.
- Climate Change effects: the LMB region will **likely be facing more severe droughts** in the coming decades and therefore a **proper planning and management mechanism** at the regional and national levels needs to be developed and put into practice before the impacts of the climate change materialise.



Mekong River Commission Governance Structure



Our Dialogue Partners



Government of China



Government of Myanmar

MRC SECRETARIAT STRUCTURE



MRC building in Vientiane, Lao PDR



Regional Flood and Drought Management Center in Phnom Penh, Cambodia

Strategic priorities for the Drought Management Strategy in LMB

1) Reduce remaining knowledge gaps to minimise risks

- Study of rural livelihoods and measures to cope with transboundary changes and by which sector development plans and projects can adopt a pro-poor agenda
- Study of options to increase storage within LMB for flood and drought management purposes
- Study of transboundary impacts of climate change on water and related resources of LMB in medium to long term and potential adaptation options
- Study of the use surface and groundwater and the potential for increasing the use and conjunctive use of groundwater

2) Optimise basin-wide sustainable development and cost and benefit sharing

- Promote, further identify, and implement cost and benefit sharing opportunities and deal structures emphasising national projects of basin-wide significance and joint projects

3) Strengthen the protection mutually agreed environmental assets

- Analyse the functioning and services of environmental assets and establish and agree on criteria for the selection and protection of these assets, including biodiversity sites, in the LMB

4) Strengthen basin-wide procedures and national implementation capacity

- Review institutional structure and capacity of the National Mekong Committees and implement support measures tailored to each country's needs
- Strengthen capacity in decentralised core river basin management functions

5) Improve national water resources development and manage

- Consolidate and support the implementation of guidelines for improvement of watershed management practices
- Prepare and implement guidelines for addressing climate change risks and opportunities in water and related sector projects, including guidelines to adapt to water shortage and drought impacts

6) Enhance information management, communications and tools

- Improve data, information and knowledge management and its access and communication for stakeholders
- Establish regional emergency communication network for flood and drought
- Develop and maintain harmonised methods, models, tools and databases for monitoring and assessment purposes

7) Increase cooperation with partners and stakeholders

- Strengthen cooperation with China on technical exchanges, information sharing and operation of Lancang hydropower dams to capture potential benefits and minimise adverse impacts

1) Mainstream climate change into regional and national policies, programmes and plans

- Climate proof MRC sectoral strategies 2016-2020 and the next BDS
- Promote mainstreaming of MASAP's adaptation strategic priorities at national level

2) Enhance regional and international cooperation and partnership

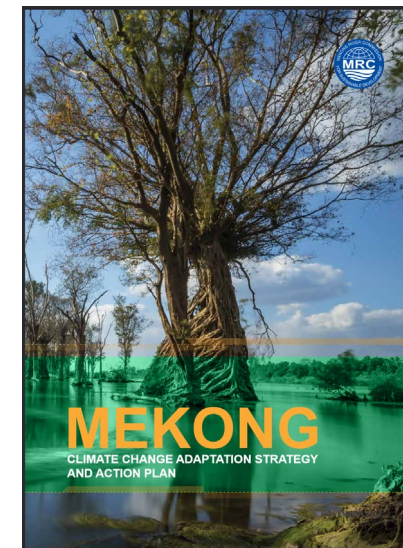
- Promote improved coordination between NMCs, national climate change focal agencies and related line agencies

3) Enable implementation of transboundary and gender sensitive adaptation measures

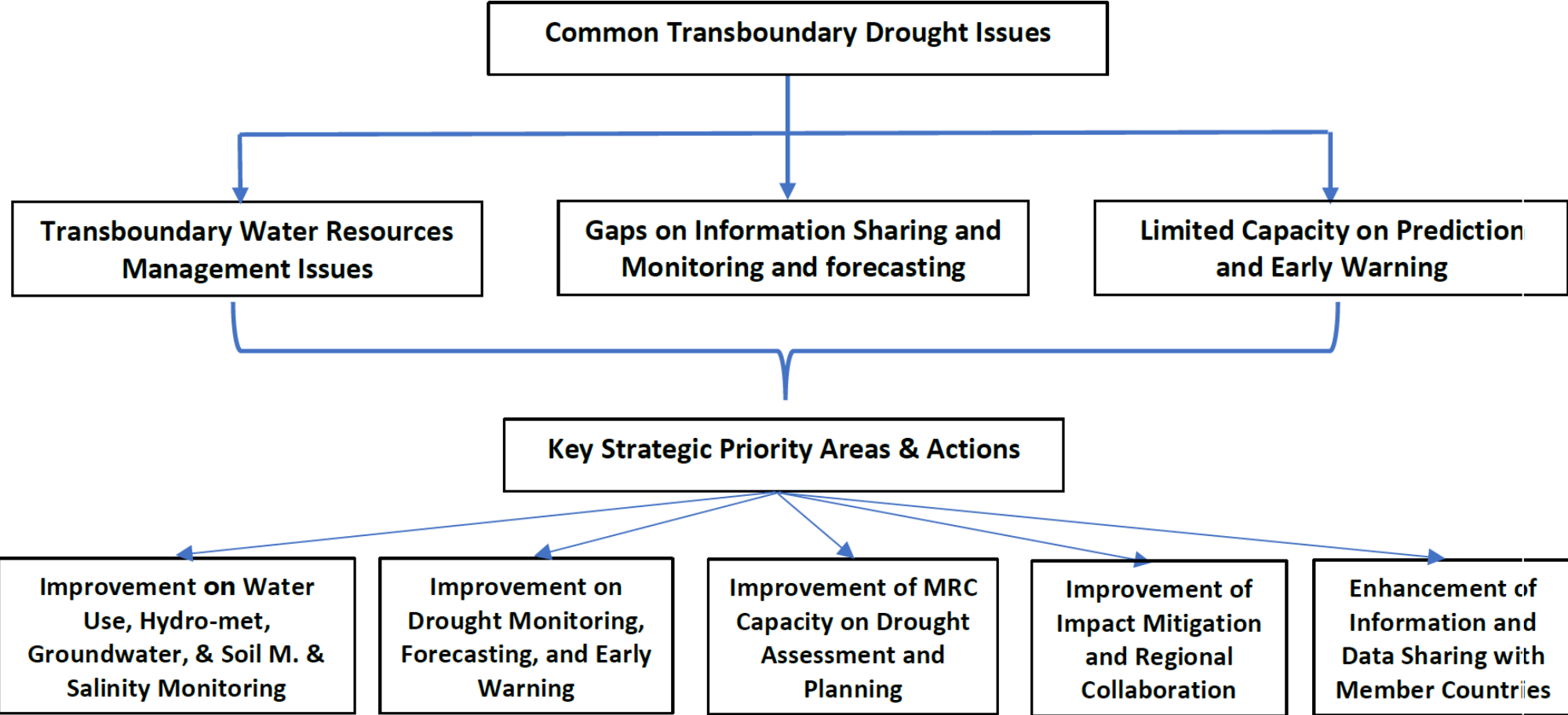
- Promote implementation of transboundary adaptation projects in climate change hotspot areas as the suggested adaptation measures and their PINs

5) Continue monitoring, data collection and sharing

- Promote enhanced and continued data collection and sharing on the agreed list of CCA indicators following the Procedure for Data Exchange and Information Sharing (PDEIS)



MRC Drought Management Strategy for the LMB



Problems identified on Drought Management

Present		Future water demand & shortage			
	National Drought Issues	Regional & Transboundary Drought Issues	Crop area	Water requirement	Water Deficit
Cambodia	<ul style="list-style-type: none"> - No drought impacts reporting mechanism - Lack of capacity on drought management as a concept - Lack of information on hydrological change regimes from upstream countries - No proper seasonal water planning - No early-warning system and lack of capacity - The drought impact reporting system is not yet well organized, reporting from communes to national level, NCDM. 	<ul style="list-style-type: none"> • Reduced water flow from mainstream causes hydrological drought in the region • Insufficient flood water in Tonle Sap causes salinity intrusion in the Mekong Delta of Viet Nam 	<ul style="list-style-type: none"> • 524,441 ha in wet season • 1,001,053 ha in dry season 	<ul style="list-style-type: none"> • 280,035 millilitres per day in wet season • 1,156,918 millilitres per day in dry season 	<ul style="list-style-type: none"> • -260,705 millilitres per day in wet season • -1185,605 millilitres per day in dry season
Laos	<ul style="list-style-type: none"> - No drought impacts reporting mechanism - Lack of capacity on drought management as a concept - Lack of information on hydrological change regimes from upstream countries - No proper seasonal water planning - No early warning system and lack of capacity - The drought impact reporting system is not yet well organized, reporting from villages and districts. 	<ul style="list-style-type: none"> • Over practice of rain making in Thailand causes less precipitation in Thailand-border of the other Country 	<ul style="list-style-type: none"> • 632,290 ha in wet season • 315,946 ha in dry season 	<ul style="list-style-type: none"> • 40,191 millilitres per day in wet season • 77,212 millilitres per day in dry season 	<ul style="list-style-type: none"> • -17,389 millilitres per day in wet season • -44,993 millilitres per day in dry season
Thailand	<ul style="list-style-type: none"> - No regular drought impacts reporting mechanism in place - Lack of information on hydrological change regimes from upstream countries - Early warning system in place, but better alignment between the different departments and institutes still needed - A Decision Support System is being developed to support early warning, among others 	<ul style="list-style-type: none"> • Overuse of ground water at the border causes slow ground water recharge in bordering downstream 	<ul style="list-style-type: none"> • 1,892,566 ha in wet season • 723,354 ha in dry season 	<ul style="list-style-type: none"> • 722,642 millilitres per day in wet season • 550,225 millilitres per day in dry season 	<ul style="list-style-type: none"> • -562,720 millilitres per day in wet season • -499,386 millilitres per day in dry season
Viet Nam	<ul style="list-style-type: none"> - No regular drought impacts reporting mechanism in place yet, reporting through national TV and radio - Integration between drought management and salinity intrusion needs to be improved - Lack of information on hydrological change regimes from upstream countries - Monitoring indicators at the national level are limited to only hydrological and meteorological indicators, in some parts more extensive drought monitoring is done - No early warning to end-users 	<ul style="list-style-type: none"> • No seasonal forecast or weather outlook yet for early warning information to Member Countries • Hydrological data sharing framework is not yet in place for hydrological change regime 	<ul style="list-style-type: none"> • 1,751,778 ha in wet season • 2,214,749 ha in dry season 	<ul style="list-style-type: none"> • 62,623 millilitres per day in wet season • 508,899 millilitres per day in dry season 	<ul style="list-style-type: none"> • -35,855 millilitres per day in wet season • -399,686 millilitres per day in dry season

Drought mitigation actions and responsible line agencies

	Cambodia	Lao PDR	Thailand	Viet Nam	MRC
Mitigation Actions	<ul style="list-style-type: none"> • Early notification by MOWRAM / Seasonal Outlook • NCDM provide water pumps to irrigate agriculture • Supply water tank to drought prone areas • Introduce crops diversification (resilience crops) • Build hydro-met monitoring stations in drought prone areas 	<ul style="list-style-type: none"> • Build hydro-met monitoring stations in drought prone areas • Carry out rehabilitation project on agricultural irrigation 	<ul style="list-style-type: none"> • Use of ground water • Water diversion from the mainstream • Monkey Cheek dams • Crops diversifications • Drought monitoring & seasonal outlook • Rainmaking 	<ul style="list-style-type: none"> • Request upstream countries to release water • Provide drought monitoring on meteo and hydrological indicators • Notify to farmers on salinity intrusion level 	<ul style="list-style-type: none"> • Provide technical support in adding drought monitoring indicators and extending new monitoring stations • Provide drought forecasting and early information including seasonal outlook • Assist Member Countries in building capacity on drought management work • Build regional mechanism on cross-country collaboration and data sharing • Help Member Countries develop a regional drought adaptation guideline • Carry out necessary study on drought related issues as needed • Issue monthly bulletin on drought forecasting
Implementing Line agencies	<p>MOWRAM:</p> <ul style="list-style-type: none"> - Early warning on seasonal outlook - Release water from dams to the farms - Provide generators to farmers for water pumping - Build hydro-met stations in drought prone areas <p>NCDM:</p> <ul style="list-style-type: none"> - Provide water tanks to farmers - Report disaster impacts to the Council Ministers - Develop drought management strategy <p>MAFF:</p> <ul style="list-style-type: none"> - Provide generators to farmers for water pumping - Introduce water-resilience crops to farmers <p>CRC:</p> <ul style="list-style-type: none"> - Provide post disaster aids to drought victims 	<p>MONRE:</p> <ul style="list-style-type: none"> - Build hydro-met monitoring stations in drought prone areas - Carry out rehabilitation project on agricultural irrigation <p>MAF:</p> <ul style="list-style-type: none"> - Carry out rehabilitation project on agricultural irrigation <p>NDMC:</p> <ul style="list-style-type: none"> - Develop disaster management strategy 	<p>DDPM:</p> <p>Set up policy and coordinate on drought mitigation</p> <p>DWR of MOENRE:</p> <ul style="list-style-type: none"> - Develop knowledge-based technology including early warning system - Collect data on water resources management <p>RID:</p> <ul style="list-style-type: none"> - Carry out ground water projects - Carry out rain making activities - Carry out water diversion - Collect drought impacts and condition from community level - Conduct water resources planning <p>DAE:</p> <ul style="list-style-type: none"> - Monitor crop growing progress <p>DLDD:</p> <ul style="list-style-type: none"> - Map drought frequency occurrence <p>GISTDA:</p> <ul style="list-style-type: none"> - Carry out drought monitoring and seasonal outlook 	<p>MARD:</p> <ul style="list-style-type: none"> - Design national disaster prevention and control strategy <p>HMS of MONRE:</p> <ul style="list-style-type: none"> - Provide drought monitoring, forecasting, and early warning <p>Viet Nam Television and Voice of Viet Nam:</p> <ul style="list-style-type: none"> - Disseminate the forecasting and early warning information <p>PPCS and MARD:</p> <ul style="list-style-type: none"> - Record damages and estimate economic losses 	<p>RFDMC of TD:</p> <ul style="list-style-type: none"> - Develop action plan and budget allocation for the DMS 2020-2025 - Coordinate with Member Countries to implement the whole DMS: <ul style="list-style-type: none"> • Support Member Countries in providing technical guideline at National areas e.g. extend hydro-met stations, install new drought parameter monitoring stations • Build capacity on drought management subjects to Member Countries and extend collaboration with academic institutes • Develop drought adaptation guidelines at regional level addressing both national and transboundary issues • Enhance collaboration with dialogue partners in data and information sharing • Develop regional drought forecasting planform with monthly drought condition analysis dissemination - Conduct M&E on DMS implementation - Develop new drought management strategy beyond 2025

Five priority areas for seasonal drought disasters preparation

(i) Indicator monitoring

- (a) Hydro-meteorological and reservoir water monitoring
- (b) Monitor on agreed dry season flow under the Procedures for Maintenance of Flows on the Mainstream (PMFM) and Procedures for Water Use Monitoring (PWUM)
- (c) Groundwater monitoring
- (d) Soil moisture and crop condition monitoring
- (e) Salinity level monitoring

(ii) Drought Forecasting and Early Warning

- (a) Drought Monitoring
- (b) Drought forecasting and early warning

(iii) Capacity Building in Drought Assessment and Planning

- (a) National and regional trainings
- (b) Regional and international workshops and conferences
- (c) Experience exchanges with other river organizations

(iv) Mitigation Measures

- (a) Collaboration with MRC Dialogue Partners
- (b) Collaboration with national agencies and regional institutions on drought risk management
- (c) Feasibility study on basin water retention through collaboration with Thailand on the Monkey Cheeks or Kaem Ling project
- (d) Water demand management measures
- (e) Development of guideline on drought adaptation
- (f) Pilot activities on drought adaptation measures

(v) Information Sharing and Dissemination

- (a) Drought information dissemination
- (b) Drought data and information documentation



Thank you



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