MONSOON FORUM REPORT

4 November 2011
Colombo, Sri Lanka




The Monsoon Forum, convened in Colombo, Sri Lanka on 4 November 2011, was organized by the Department of Meteorology (DOM) – Sri Lanka as part of the project "Reducing risks of tsunamis, storm surges, large waves, and other natural hazards in low elevation coastal zones in Bangladesh, India, Maldives, Myanmar, Sri Lanka and Thailand" supported by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and jointly implemented by the World Meteorological Organization (WMO) and the Regional Integrated Multi-hazard Early Warning System (RIMES).

Activity Background

The project "Reducing risks of tsunamis, storm surges, large waves, and other natural hazards in low elevation coastal zones in Bangladesh, India, Maldives, Myanmar, Sri Lanka and Thailand", hereinafter referred to as "the project", has the following components:

a) strengthening national and local institutions for end-to-end warning
b) connecting pilot sites to national warning system for 24/7 readiness
c) capacity building, involving disaster risk managers, civil protection officers, and select communities, for the application of warning information products
d) capacity building, involving NMHSs in project countries, for generation of location-specific warning information products
e) regional sharing of experiences, practices, lessons learnt and successes for possible replication

As part of the first component, the 4th Monsoon Forum was convened as a platform for DOM and its user institutions to have interface to:

- review the monsoon season that has just concluded, in terms of climate patterns, outlook performance, and impacts on the different climate-sensitive sectors in the counties;
- discuss the outlook for the season ahead and possible sectoral impacts, and the response options that can be carried out by user-institutions for enhanced management of risks;
- discuss difficulties/challenges/gaps in the application of forecast information, and possible mechanisms of bridging such difficulties, including meeting the demand for sector-specific information requirements
- other issues and concerns relevant to the NMHSs and climate information user institutions

In Sri Lanka, the first three (3) Monsoon Forums, organized by DOM between March 2009 and May 2010, was facilitated under the American Red Cross (ARC) – supported "Facilitating the integration of tsunami warning into the multi-hazard early warning system".

The 4th Monsoon Forum, likewise organized by DOM, was participated by 57 participants coming from the following institutions:

- Central Environment Authority (CEA)
- Ceylon Electricity Board (CEB)
- Coastal Conservation Department (CCD)
- Department of Irrigation (DOI)
- DOM
- Department of Fisheries (DOF)
- Disaster Management Center (DMC)
- Ministry of Health (MOH)
- National Building and Research Organization (NBRO)
- National Water Supply and Drainage Board (NWSDB)
- Urban Development Authority (UDA)
- Sri Lanka Navy (SLN)
- Sri Lanka Red Cross Societies (SLRCS)
- Media organizations

Representatives from Kalutara and Pottuvil administrative offices also participated in the Forum. Kalutara and Pottuvil, both composed of coastal communities, are the project pilot sites. The participation of representatives from both pilot sites is intended to introduce them to

the Monsoon Forum process, as well as to discuss with them the project details, and to obtain their support.

Monsoon Forum Proceedings

Opening Program

The Monsoon Forum was officially commenced by the lighting of oil lamp and the singing of the national anthem. Subsequently, Mr. G.B. Samarasinghe, DOM Director, welcomed all the participants to the Forum and conveyed his thanks to everyone present for the usual support accorded to DOM. He emphasized that the Forum is facilitating regular dialogues between DOM and user institutions for enhanced application of early warning information.

Mr. Samarasinghe thanked RIMES for the continued support to the Government of Sri Lanka, particularly the DOM. He also espoused that RIMES is working with WMO in implementing the project. Mr. Samarasinghe continued that he was looking forward to the benefits that the project will be able to generate for the country.

Mr. Samarasinghe also put emphasis on the participation of the media. He underscored that the marriage of the NMHSs and media organizations is very important, as it is through media that the general public is reached.

Hon. Mahinda Amaraweera, Minister of Disaster Management, graced the occasion and delivered a message. In his message, the Honorable Minister stressed that the Monsoon Forum is an important platform for discussion of many issues appertaining DOM and forecast-user institutions. In a country with two (2) monsoon seasons, Hon. Amaraweera espoused that a regular dialogue to encourage the application of climate/weather information is very essential. He mentioned that many times, development is hampered by climate-related hazards. Particularly in Sri Lanka, floods had caused more damage than tsunamis, primarily because of the frequency of the occurrence the former. He underscored the need for strengthening institutional systems in end-to-end warning. He conveyed his hope that the collaboration of the different institutions will contribute to strengthening of capacities in responding to natural hazards, especially for coastal areas.

He then thanked all the participants for their participation, and donor and implementers for their support to the country.

Review of the Southwest Monsoon Season

Mr. D.A. Jayasinghearachchi, Meteorologist In-Charge, National Meteorological Center, DOM, presented the review of the Southwest Monsoon performance and the seasonal prediction realized. In his presentation, Mr. Jayasinghearachchi outlined the monsoon and inter-monsoon seasons, and the agricultural seasons [*Yala* (March-August) and *Maha* (September to February] in the country. Average rainfall for the different zones, during the monsoon and inter-monsoon seasons were explained. He also discussed that generally, rainfall is recorded at higher values in the western slopes of the country, and lower values in the Southeastern and Northwestern coastal areas.

Subsequently, Mr. Jayasinghearachchi discussed the different forecast products from DOM. He emphasized that DOM's forecast products are shared with key stakeholders like the CEB, DOI, DOA, CCD, DOF, NBRO, and DMC, among others.

He then proceeded with the discussion of the seasonal outlook for 2011 Southwest Monsoon which indicated high probability for above average rainfall in the country. The seasonal

outlook, Mr. Jayasinghearachchi explained, was based on model outputs from different global climate centers. Inputs from scientists from South Asian countries, during the South Asian Climate Outlook Forum held in India in April 2011, were also considered in the development of the seasonal outlook for Sri Lanka for the Southwest Monsoon. Further, the outlook also took into consideration the Neutral Network, Multiple Regression Equation (MRE), Climate Predictability Tool (CPT), Sea Surface Temperature (SST) over the Indian Ocean, and snow cover over the Northern Hemisphere.

Mr. Jayasinghearachchi then proceeded to compare the observed rainfall, from May to September, and the average rainfall for 20 districts which revealed that all rainfall stations in the said 20 districts recorded less than the average rainfall, some less than half of the average rainfall. The overall recorded rainfall for Sri Lanka during the Southwest Monsoon was below normal. Most of the stations recorded the lowest rainfall during the last five (5) years.

Following that, Mr. Jayasinghearachchi explained the limitations and uncertainties in seasonal prediction.

Subsequently, Dr. PVS Raju, Senior Climatologist, RIMES, presented the overview of the global seasonal climate and prediction performance. Dr. Raju discussed, among others, the wind anomalies in South Asia as recorded rom 1959 to 1988, total precipitation and percent of normal precipitation for South Asia from July to September 2011, average temperature and temperature anomalies in South Asia from July to September 2011, and Sea Surface Temperature anomaly for the Nino 3.4 region.

The sector presentations then followed. Below is a summary of key points discussed by presenters during this session.

Impact of climate/weather on power generation by CEB

The presentation was rendered by Eranga Kudahewa, Electrical Engineer, System Control Center, CEB. The presentation mentioned the mandate of CEB as the main supplier of power to the different sectors in the country and the daily challenge for CEB to meet the demand for electricity by its consumers.

Also part of the discussion was the importance of climate information in guiding decisions by the CEB management – timely and reliable climate information can be used to develop good prediction of inflows in reservoirs, and good inflow prediction assist CEB decision-makers to achieve optimum operation of reservoirs.

The presentation underscored that Southwest Monsoon season for 2011 was a very challenging season for CEB – the lowest inflow for July was recorded.

Landslides early warning system based on rainfall

This presentation was rendered by NBRO. The discussion included the landslide-prone areas in Sri Lanka that are spread over several districts and covers 20% of the country's area. The presentation highlighted that the main trigger for landslides, in the country, is rainfall. Hence, areas affected by landslides change with the monsoon and inter monsoon seasons.

The presenter shared that records of landslide events from 1942-2007 show that a large number of landslides occurred in May 2003 and January 2007. In 17 May 2003 alone, more than 600 landslides were recorded in Ratnapura, Kalutara, Galle, Matara, and Hambantota districts. The landslides were triggered by intense rainfall from 15 May 2003 which peaked at 350mm in 17 May. On the other hand, more than 400 landslide events were recorded on January 2007 at

Walapane and Haguranketha, after heavy rains were recorded in December 2006 and January 2007.

The presenter explained that NBRO has established a warning and evacuation system for landslides. The thresholds are as follows:

- Alert – 75 mm/day
- Warning – 100mm/day
- Evacuation, area is off-limits – 75mm/hour or 150mm/day

To facilitate better access to rainfall data, a network of intra-government rainfall stations was established. The government is looking into the expansion of the said network of rainfall stations in the country.

The presenter espoused that timely and reliable information on rainfall assists NBRO in preparing its contingency plans, as well as warn people in landslide-prone areas.

Climate Impacts on Irrigation

Presented by the DOI, the discussion centered on the mandates of the institution, including providing irrigation services to the agriculture sector and providing early warning for flood. The importance of climate information in the institution's operations was also emohasized. With rainfall that was below normal, the 2011 Southwest Monsoon presented a huge challenge to DOI. However, DOI was able to manage the situation effectively as water from the previous monsoon season had been stored in the reservoirs and used to irrigate agricultural lands.

Monsoonal Coastal Environment

This presentation was rendered by the CCD. The presentation mentioned the contribution of the coastal region in Sri Lanka (approximately 22% of the total area and a coastline of 1,620 kilometers) to the national GDP. The discussion delved on the significance of monsoons to the coastal belt, which include:

- Beaches are fed by sand flow through the rivers during the monsoons
- Monsoon rains are important for the stability of beaches

On the other hand, the monsoon seasons pose hazards as wave heights are generally higher during the monsoon season. In many cases, monsoon rains cause flood in the coastal areas. Developmental work at the coastal zones are at a standstill during monsoon seasons, to avoid waste of resources.

For the information of the participants, CCD also explained about its work on tsunami modeling and development tsunami hazard maps, which was undertaken with RIMES.

Outlook for the Northeast Monsoon Season, Impacts Outlook and Response Options, and Way Forward

The outlook for the Northeast Monsoon season was presented by Ms. Anusha Warnasooriya, Senior Meteorologist, DOM. The discussion first focused on the high correlation of the El Nino Southern Oscillation (ENSO) and Indian Ocean Dipole (IOD) conditions with the seasonal rainfall over Sri Lanka and the tropical Indian Ocean region. She explained that during El Nino events, the modulations of climate in Sri Lanka are due to the alteration in intensity and location of the large-scale equatorial circulation system. Subsequently, she explained that IOD conditions affect South Africa, Indonesia, Australia, and other countries around the Indian Ocean. She discussed on the positive IOD in 1997, and the rainfall anomaly in the country during that time. El Nino and La Nina conditions, in the previous years, were

discussed, and the prevalence of La Nina condition, until March of 2012, across the equatorial Pacific.

The seasonal outlook for November, December and January (NDJ) was then presented.

Working Group Discussion and Presentation

As part of the Monsoon Forum, the participants were divided into four (4) groups to discuss on the possible sectoral impacts and response options that can be carried out by the different institutions/sectors, based on the seasonal climate outlook. The participants discussed and presented outputs based on the following discussion guide:

1) What would be the possible impacts, in the different sectors, based on the seasonal outlook?
2) What possible responses (mitigation measures) can be done in case of possible adverse impacts?
3) What channels/mechanisms can be used to maximize the dissemination of the seasonal outlook (and the impacts outlook and response options) to concerned institutions, organizations, and individuals?
4) Any recommendation to address constraints/gaps/difficulties in translating the seasonal outlook into impacts outlook and response options, enhance the usability of seasonal outlook and other forecast products, and the conduct of Monsoon Forums in the future?

Presented below is the synthesis of the group presentations. The recommendations, from all the group outputs, are presented in a subsequent section.

Group 1
(This group was composed of representatives from the administrative organizations in Kalutara and Pottuvil)

Possible Impacts	
Kalutara	*Pottuvil*
Floods may occur during heavy rainfall. The flooding situation in Kalutara is usually aggravated by the inefficient drainage system.	The rainfall for NDJ may trigger hazards like flood which may affect farmers and other sectors.
Possible Mitigation / Response Measures	
• **Raise the awareness of stakeholders like farmers and fishermen.** • **Advise rubber growers to plan their undertakings based on the weather/climate information.** • **Instead of *chena* cultivation, promote the cultivation of alternative crops and varieties like cinnamon, etc.** • **Clear drainage systems in urban areas and maintain them properly.**	
Climate / Warning Information Dissemination Mechanisms	
• **Information dissemination should be handled by the Grama Niladhari (GN), Rural Development Society (RDS), CBO leaders, and religious representatives**	

Group 2
(This group is composed of CCD, DOF and SLN)

Possible Impacts

• **Erosion/floods**
  ○ **More sediments supply due to heavy rainfall**
  ○ **Coastal flooding due to rainfall and sandbars**
  ○ **Sand bar formation obstructs fishing activities**

Possible Mitigation/Response Options
• **Removal of sand bars** • **Preparedness for flood relief activities**
Climate/Warning Information Dissemination Mechanisms
• **Sms/mobile alerts for communities** • **Make the forecast available through the website to facilitate guidance for offshore vessels and/or coastal communities**

Group 3
(This group is composed of CEB, DOI, MASL, NBRO and NWSDB)

Possible Impacts	
Positive	*Negative*
• **Good inflow in downstream reservoirs. The macro system storage can be improved because of less water releases to downstream areas.** • **Due to improved macro system storages, CEB can bring economic benefits to the country.** • **Stress on the cultivation program could be avoided.** • **Water supply facility can be improved through point sources and rain water harvesting.**	• Landslides are likely to occur in landslide-prone areas. • Cultivation/agricultural lands could be silted due to floods that may occur. • Damages to properties and threats to human lives may arise.
Possible Mitigation/Response Options	
• **Early warning system should be established in landslide-prone areas and areas that might be affected by reservoir spilling** • **Introduce subsidies to the most likely affected constituents through the Disaster Management Center (DMC)** • **Close monitoring of the climate situation and flood- and landslide-prone areas should be conducted** • **Evacuation/contingency plans should be put in place.**	
Climate/Warning Information Dissemination Mechanisms	
• **Make use of the media in disseminating climate/warning information to the people** • **Institutions and organizations can facilitate dissemination of information to their stakeholders through their own information dissemination protocol/system.**	

Group 4
(This group is composed of MOF, LEA, SLRCS, and UDA)

Possible Impacts

Health	*CEA*	*UDA*	*SLRCS*
• **Rise of communicable diseases/outbreaks as a consequence of floods**	• Water and/or air quality might be affected • Research opportunities on environmental impacts of climate	• Some resettlement issues might rise • Implications on policies/regulations	• Landslides and food may occur. • Health issues might also rise.
Possible Mitigation/Response Options			
• **Preparedness for possible outbreak of dengue, diarrhea** • **Hospital readiness** • **Awareness program** • **Medicine stockpiling** • **Capacity building for human resource**	• Embark on research and development	• Declaration of buffer zones • Development and implementation of regulations and policies for wet land filling, for example • Relocations of households that might be affected by the hazards	• Location-specific response planning and preparedness measures
Climate/Warning Information Dissemination Mechanisms			
• **The Ministry of Health can disseminate the climate/warning information through its own dissemination system/protocol.**	• Government dissemination system/protocol	• Government dissemination system/protocol	• SLRCS can disseminate information through its own system/protol – National Headquarters to branches, branches to divisions, divisions to volunteers, and volunteers to community

Recommendations

The following recommendations were synthesized from the group presentations.

- Wind outlook is not provided in the seasonal prediction, hence there is difficulty in predicting erosion. It is recommended that wind outlook be made as part of the seasonal climate outlook.
- Thematic or sectoral Monsoon Forums should be conducted to facilitate provision of sector-specific information needs.
- Forecasts need to be customized to the need of the different sectors.
- Forecasts should be location specific
- Monsoon Forums should be organized before the start of the *Yala* and *Maha* agriculture seasons, so that the information can guide farmers in their decision-making.
- It will be better if more institutions are invited to participate in the forum.
- Provide climate information, through official channels, to user-institutions for planning purposes.

- Climate information awareness should be introduced in the school level, so that the young generation will have a deeper understanding of their climate.
- Promote better collaboration/relationship between government, non-government, and sectors in the grassroots level to encourage enhanced management of risks brought about by the monsoon rain.
- Technical guidance should be provided to farmers, by the relevant institutions, especially in terms of new methodologies in farming which may be more efficient, and cost-effective, given the climate information.
- Relevant institutions like the Ministry of Agriculture should provide guidance to farmers as to the seasonal crops and varieties that are most suitable for the season.
- Different sectors should have meteorologists, who can be in-charge of analyzing climate information and provide guidance to decision-makers on the implications of climate information. Likewise, every institution should have focal points/duty officers who should take charge of all matters pertaining to the application of climate information.
- Information/data sharing among institutions should be forged so that the usefulness of data can maximized.

Closing Program

Mr. G.B. Samarasinghe thanked all the participants of the Forum for sharing their inputs and insights. He espoused that the interaction during the working group discussion had been most valuable and DOM will be guided by the participants' recommendations in introducing developments into its forecast products. Mr. Samarasinghe indicated that DOM agrees to do the regular forum before the *Yala* and *Maha* agricultural seasons. He further espoused that other issues presented as recommendations will be discussed and DOM will work on addressing the issues raised. He clarified that the process of injecting changes will not take overnight. He emphasized though that DOM's collaboration with climate stakeholder institutions, through the Monsoon Forum, provides DOM a clearer view of the requirements and needs of the user institutions.

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