Monsoon Rainfall and Unusual monsoon tornado over the riverine region of Bangladesh

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Monsoon rain is of enormous importance to give shape to agriculture, economy and rhythms of life of the South Asian region. The seasonal forecast of the monsoon is very crucial for policy makers in planning economy of the country.

The Road Map of South Asian Monsoon Initiative Programme

**Monsoon Initiative Programme**

**Regional Working Group (RWG): Scientific/Technical**

**Regional Working Group (RWG): DM and Vul. Assess and Impl**

**Capacity Building & Coordination**

Vulnerability Assessment & Risk Reduction for SAARC Region by SDMC, SAC, RIMES & ICIMOD

**National Working Groups (NWG): NMHSs, DM, Space Agency, Ag, Water Sector and related Stakeholders**

**Phase-I: 2013 - 2015**
- Data collection, processing and analysis
- NMHSs of SAARC, IITM, NCMRWF, ICIMOD, COMSATS, RIMES & SMRC

**Phase-II: 2016 - 2018**
- Continue data collection, processing, analysis, in-depth research and publication of comprehensive reports by SMRC in collaboration with NMHSs

**Prep of GIS based Vul maps**

**Integrated Operational System (IOS)**

Alam 2014; Das et al., 2011
Table 1: Number of low pressure systems and depressions formed over the Bay of Bengal during monsoon season for the year 2006-2010.

<table>
<thead>
<tr>
<th>Year</th>
<th>Over the Bay of Bengal WRF Model Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of low pressure formation / Depressions</td>
</tr>
<tr>
<td>2006</td>
<td>37</td>
</tr>
<tr>
<td>2007</td>
<td>28</td>
</tr>
<tr>
<td>2008</td>
<td>26</td>
</tr>
<tr>
<td>2009</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 2: Actual rainfall and percentage departure from the normal in Bangladesh
Long period average (LPA) rainfall of SW monsoon over Bangladesh is 1721 mm.

<table>
<thead>
<tr>
<th>Year</th>
<th>Actl. % Dep</th>
<th>Actl. % Dep</th>
<th>Actl. % Dep</th>
<th>Actl. % Dep</th>
<th>Actl. % Dep</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>1616 -6%</td>
<td>1960 14%</td>
<td>1805 5%</td>
<td>1660 -4%</td>
<td>1399 -19%</td>
</tr>
</tbody>
</table>

Present Research Problems and Further Attempt

◆ There are many limitations in this study and the work can be further expanded subject to availability of computing facilities. In such studies, it is important to predict the anomalies of the rainfall at monthly and seasonal time scales. The anomalies can be computed by making climatology of both model and observed rainfall based on at least 25-30 years.

◆ Another important point is that in the seasonal time scale, the Sea Surface Temperature (SST) plays an important role influencing air-sea interaction and large-scale circulation. Thus, the SST has to be incorporated during the model integrations.

◆ The 3rd point is to project the model rainfall on the same grid as the observed rainfall for calculations of objective skill scores.

◆ More research is required using various parameterization schemes for calibration and producing better forecasts of the seasonal monsoon rainfall. The present work can be extended in future to cover all these aspects.

Das et al., 2011
Unusual monsoon tornado over the riverine region of Bangladesh

Tornado affected unions of Faridpur districts of Bangladesh (left panel.) on 21 Aug. 2016. The most destruction path of Tornado around Jobaida Karim Jute Mills Ltd., Bakhunda, Greda union of Faridpur, Bangladesh.

(a) 950 hPa wind, (b) vertical velocity, (c) cloud water mixing ratio and, (d) ice water mixing ratio

Das et al., 2016
Thank You 😊