A growing international network since 1996

- 13 Regional Water Partnerships
- 84 Country Water Partnerships (in 2013)
- 2,904 institutional Partners in 172 countries (in 2013)
Observed Changes – Drought Severity

Palmer Drought Severity Index (PDSI) for 1900 to 2002

Source: Dai et al. 2004
Regional Water Security Index for South Asia

Source: Asian Water Development Outlook 2013
Drought and Agriculture in South Asia

- Over 1 Billion South Asia depend on agriculture
- Most vulnerable sector

<table>
<thead>
<tr>
<th>Country</th>
<th>Agriculture contribution to GDP / percent</th>
<th>Rural population / percent</th>
<th>labor force employed in agriculture / percent</th>
<th>Agricultural Area / percent</th>
<th>Irrigated area / percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>31.6</td>
<td>77</td>
<td>70.0</td>
<td>58</td>
<td>3.4</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>18.6</td>
<td>72</td>
<td>48.0</td>
<td>65</td>
<td>35.1</td>
</tr>
<tr>
<td>Bhutan</td>
<td>17.4</td>
<td>65</td>
<td>59.4</td>
<td>15</td>
<td>1.0</td>
</tr>
<tr>
<td>India</td>
<td>19.0</td>
<td>70</td>
<td>56.0</td>
<td>55</td>
<td>18.9</td>
</tr>
<tr>
<td>Maldives</td>
<td>5.6</td>
<td>60</td>
<td>12.0</td>
<td>30</td>
<td>--</td>
</tr>
<tr>
<td>Nepal</td>
<td>32.8</td>
<td>81</td>
<td>66.0</td>
<td>30</td>
<td>8.0</td>
</tr>
<tr>
<td>Pakistan</td>
<td>21.2</td>
<td>64</td>
<td>45.0</td>
<td>33</td>
<td>25.0</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>12.8</td>
<td>85</td>
<td>33.0</td>
<td>40</td>
<td>8.9</td>
</tr>
</tbody>
</table>

Drought Related Activities GWP SAS

GWP SAS APAN Policy Brief 2014
Developing Climate Resilient Water Management Plans/ Agriculture Systems for Water Stressed Areas in South Asia

Thematic Node
WATER
Asia Pacific Adaptation Network (APAN)
Objectives

• Provide government with assessment of on-ground situation based on rapid reconnaissance, discussions with stakeholders and overall observations and conclusions drawn by the team

• Propose a development agenda around water development to help initiate detailed development strategy
Activities carried out in Tharparkar - PWP

- Demonstration of Bio Sand Water Filter
- Traditional Methods of Soap Making
- Distribution of Hybrid Napier
- Distribution of Medicine
- Rain Water Harvesting

Activities were carried out in 2 villages of District Tharparkar

More than 130 children have died due to malnutrition and disease in Tharparkar district
<table>
<thead>
<tr>
<th>Country</th>
<th><strong>1</strong> Existence of Drought Early Warning System</th>
<th><strong>2</strong> Capability to contribute to Drought Monitor/Early Warning</th>
<th><strong>3</strong> Requirement for infrastructural support</th>
<th><strong>4</strong> Rating of usefulness of Drought Monitor/Early Warning System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>No</td>
<td>Very Low – No prediction capability</td>
<td>Very High – Technical and Training Support needed</td>
<td>“Very essential”</td>
</tr>
<tr>
<td>Bhutan</td>
<td>No</td>
<td>Very low – daily and seasonal rainfall prediction</td>
<td>Very high – satellite images of moisture contents, hydrological models, forecast products</td>
<td>“Important”</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>No</td>
<td>Medium – experience in flood warning, usage of drought prediction tools</td>
<td>High – Technical support and training needed</td>
<td>“Very essential to ensure food security”</td>
</tr>
<tr>
<td>Maldives</td>
<td>No</td>
<td>Medium – Experience in flood &amp; rainfall early warning</td>
<td>High – Technical support and training needed</td>
<td>“Very essential to ensure drinking water”</td>
</tr>
<tr>
<td>Nepal</td>
<td>No</td>
<td>Low – experience in collecting post-drought information</td>
<td>Very high – more hydro-met stations required</td>
<td>“One of the best initiatives in the region and my country”</td>
</tr>
<tr>
<td>India</td>
<td>Yes – especially powerful in certain regions</td>
<td>Very high – experience in usage of different drought indices</td>
<td>Medium – nationalized institution needed who can run a Drought Early Warning System</td>
<td>“Extremely useful and essential”</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Yes</td>
<td>Very high – weather radar and GIS spatial integration systems capability to identify drought</td>
<td>Medium – information for specific drought prone areas needed</td>
<td>“Moderate in own country”</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>No</td>
<td>Low – capacities exist, but need improvement</td>
<td>Very high – information tailored to the area is needed</td>
<td>“Very useful”</td>
</tr>
</tbody>
</table>

Table: Overview of the responses. Colour scale indicating country capacity:
No validated system of DM that could meet the requirement for a high spatial resolution in any of the surveyed countries

Challenges that the countries face at present in drought monitoring are:
- lack of hydrological / meteorological measurement stations
- missing access to satellite data
- insufficient rainfall prediction capability
- shortage of well-trained staff

Development of an institutional mechanism of functional collaboration across ministries and departments at the sub-national, national and regional/ international level is also essential

There is a need to shift emphasis from disaster response to risk management: to improve drought forecasting; to establish early warning systems and to improve communication flow
Ground Verification May 2014 Sri Lanka Drought
• GOAL deliver a newly integrated drought monitoring method by selecting the best combination of variables with better accuracy

• At present countries SA - use traditional methods (Ex: SPI based on rainfall data) in Drought Assessment & Monitoring

• Remote sensing technology provides alternative data for operational drought monitoring, with advanced temporal and spatial characteristics

• Integration of traditional meteorological data, remotely sensed drought indices, together with information on elevation, vegetation type, and man-made irrigation, provides a promising approach to better characterize the spatial extent and intensity of drought
There are three Phases in the project:

1. Development and calibration/testing of the monitoring method, using most advanced drought indices, and multiple (climate, hydrology, RS, in-situ data) data sources; Phase I

2. Development of the operational online prototype drought monitoring system; Phase II

3. Capacity building (development of detailed Training Manual), customization for national needs and dissemination of the monitoring product in the region; Phase III

DMS installed in national center(s), subject to interest and necessary facilities or and in identified regional Hub; Phase III
SA DMS Beneficiaries

Primary users

• Ministries of Agriculture
• National Disaster Management Centers
• Farmers - main beneficiaries
• Decision-makers
• non-governmental agencies involved in global, regional and national drought advocacy, awareness and response efforts; stakeholders vulnerable to drought; and population in general
SA DMS End of Phase I

• Present a beta version of the South Asia Drought Monitoring System (SADMS) in corporation with national partners in South Asia
• Have a dialogue with national partners of their country requirements to ensure it responds to the need of users
• Start a discussion on how to integrate the results of the SADMS to regional, national and state level decision making processes
• To have initial awareness on the final product and attract the attention of key actors in the water & climate community
SA DMS Implementation

• Keep the input data simple and ensure that there is an understanding on what basis drought risks are being generated for SA DMS to gain acceptance by users

• Include ground verification of the results

• Uncertainty to be communicated clearly to users

• Efforts are made to include the outputs of the SASCOF as well as any National Climate Outlook Forums

• Involvement and ownership of government agencies and the users from the beginning in SA DMS development (facilitated by CWPs)

• SADMS to have the potential to be used as a South Asia Drought Early Warning (SADEWS)
Existing Cooperation Mechanisms in South Asia SAARC - DMC

Outcomes Kabul workshop - definition of five broad areas of regional cooperation

• Drought Monitoring and Early Warning
• Drought Research and Documentation
• Training and Capacity Building for Drought Management
• Sharing of Good Practices on Drought Risk Management
• Development of a South Asia Drought Network
SAARC DMC National Focal Points

- Afghanistan - Afghan National Disaster Management Authority
- Bangladesh - Department of Disaster Management
- Bhutan - Ministry of Home and Cultural Affairs
- India - Ministry of Home Affairs
- Maldives - National Disaster Management Centre
- Nepal - Ministry of Home Affairs
- Pakistan - National Disaster Management Authority
- Sri Lanka - Ministry of Disaster Management and Human Rights
Snowballing Responsibility for Early Warning
Sri Lanka (same in other countries)

- Whose responsibility was it anyway?
- Meteorology Department - Wind Speed 80 Km/h
- has not been conveyed properly to the fishermen
- fishermen ventured off to sea June 07-08, 2013
- recovered the bodies of around 54 fishermen
- 07 reported missing and 12 people received injuries
- translate monitoring – Early Warning
- lapse in communication regarding the weather warning – Department of fisheries, disaster management – use of mobile phones
- Communication & Inter agency coordination for Early Warning is critical – responsibilities needs to be clearly identified/ defined
Thank You