DFID Asia Weather and Climate Services scoping

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ACWS Session, for different countries

Key questions:

1) What are the current projects and activities
2) What are the gaps or technical weaknesses in current provision of regional weather and climate information for the national/sub-national level to enable effective emergency response
3) (Not location specific) what other relevant programmes may help to inform?

Questions

1) Could you describe your current role and what you see as the main priorities for weather and climate services in the South Asia Region?

Cover current and planned main activities in the region
Cover immediate priorities and over the next few years

Regional structures and players

2) Who are the main providers of regional weather and climate services?

What are their respective roles?
Who do you think are likely to be the most effective regional bodies to work with?

3) What regional structures and processes are in place for delivering these services?

What is the linearity of these structures?
Where are the gaps and barriers and why?

Questions (cont)

Regional to national and local links

4) How well does information flow between regional, national and local levels?
How well are requirements understood and producers and users interacting?
What are the gaps and barriers identified?
•What are the gaps or technical weaknesses in providing regional weather and climate information at regional – national – local scales?

5) AWCS development
•Do you work with other donor organisations or are you planning to?
•What do you see as the main opportunities for developing a regional climate programme?
•What would suggest should be the main priorities and activities of a regional programme?
•What are your suggestions for "quick-start" activities?

Met Office

FLOODFORECASTINGCENTRE

a working partnership between Environment Agency | Met Office

Thank you…..

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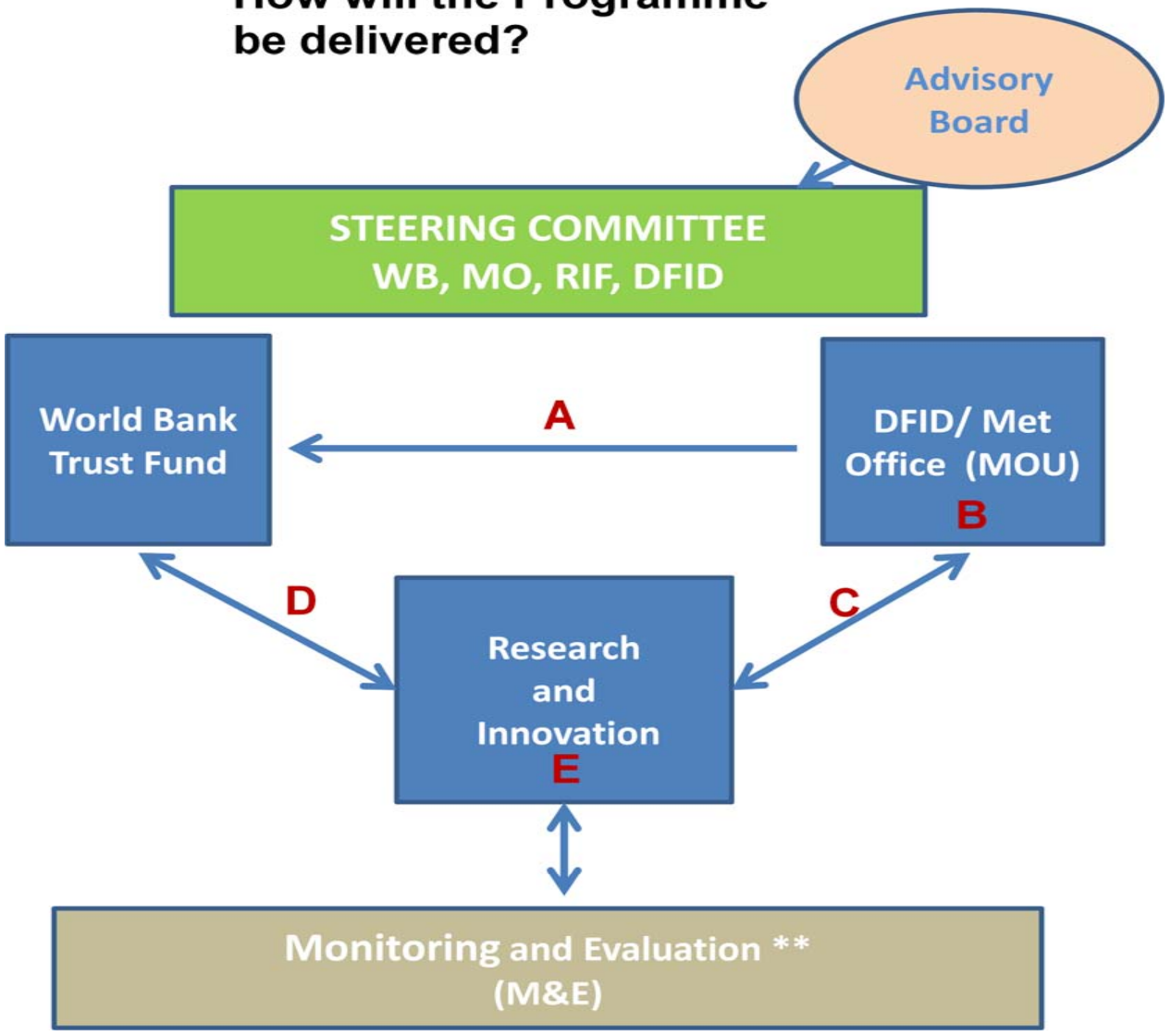
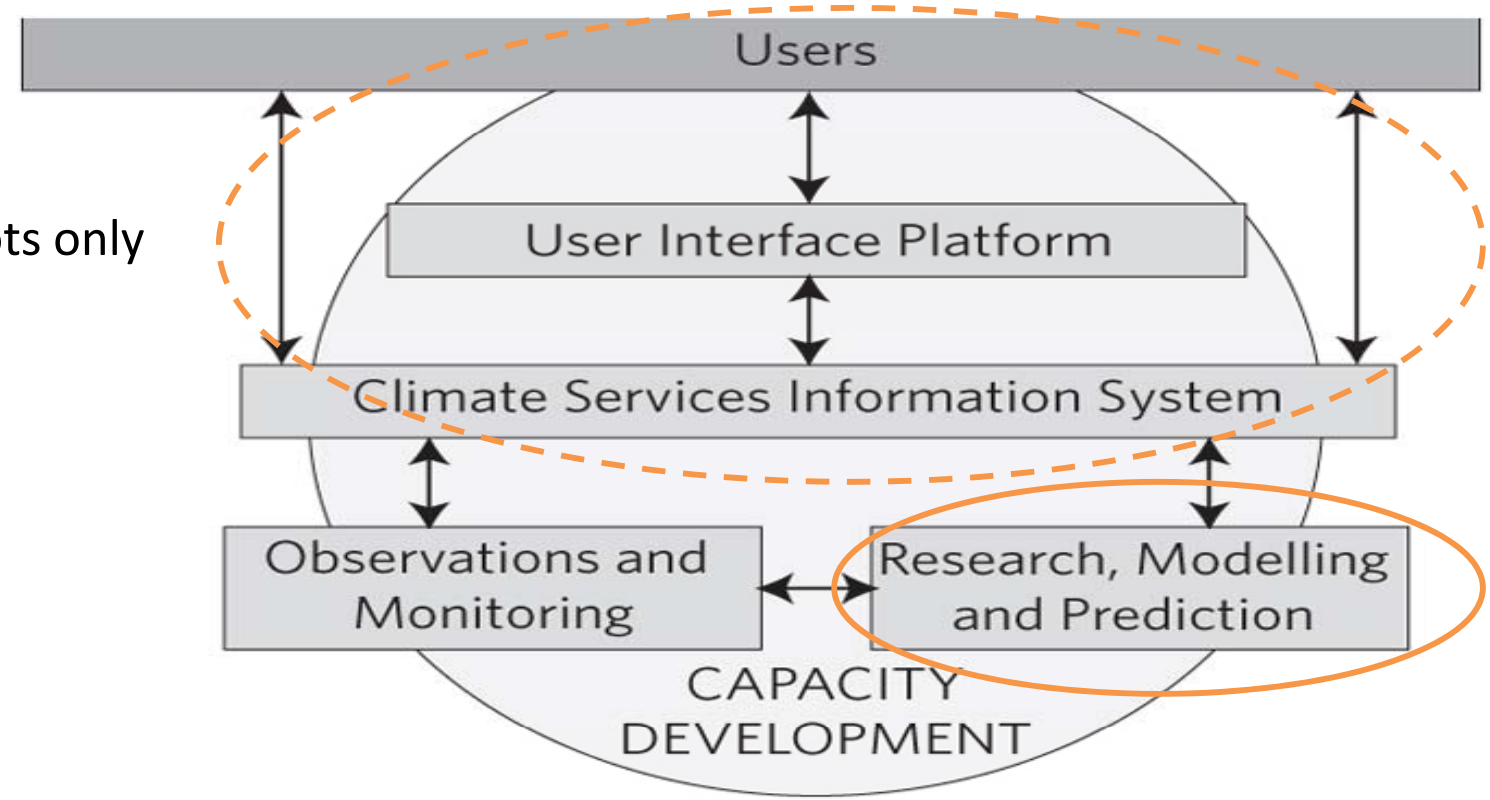
How will the Programme be delivered?

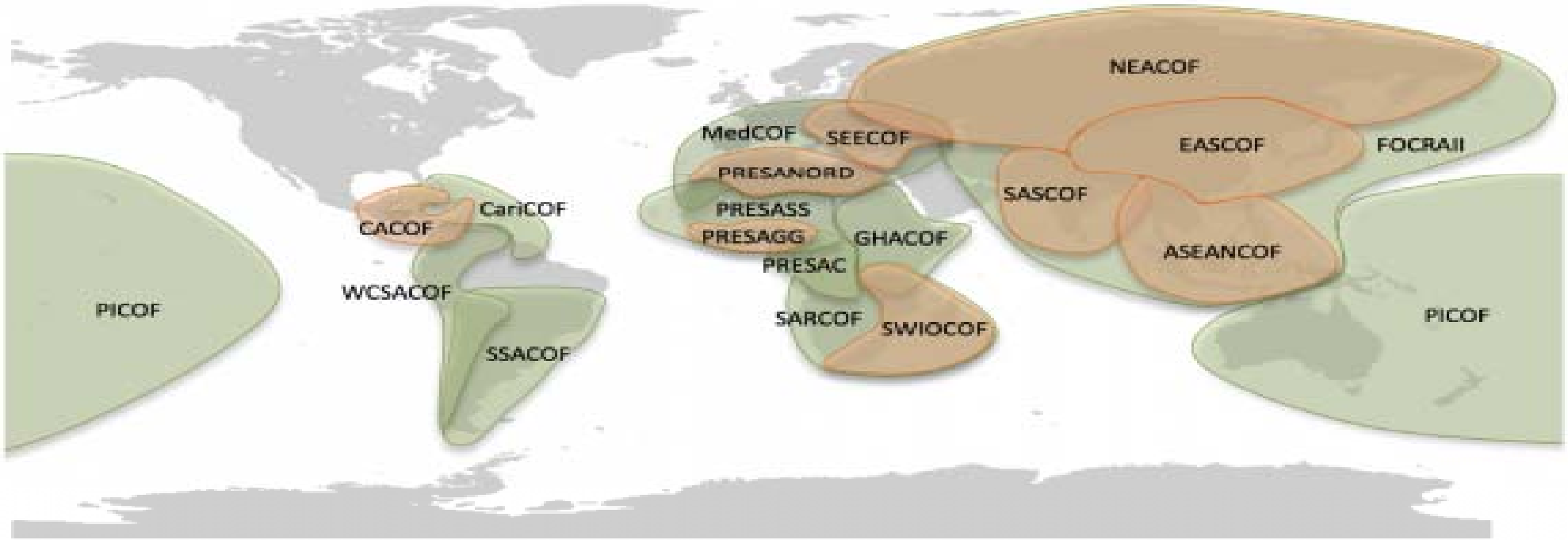


The Global Framework for Climate Services (Hewitt et al., 2012)

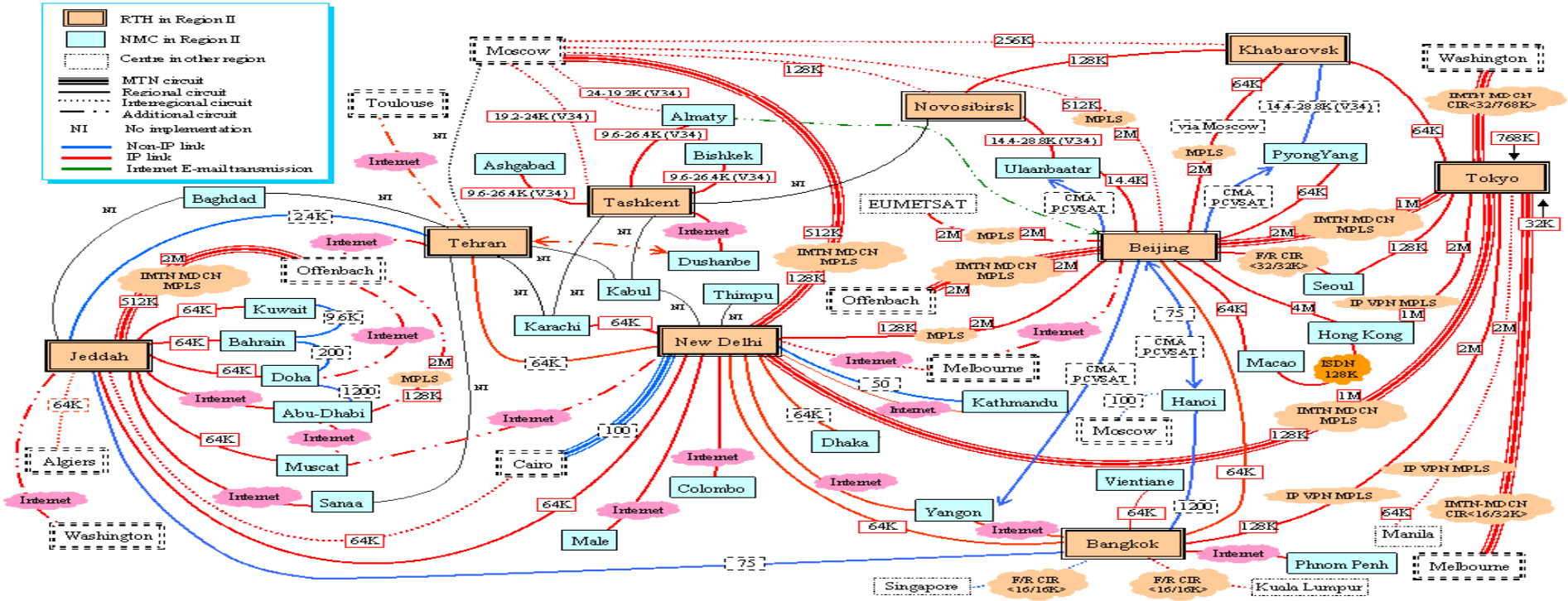
Pilots only



Regional Climate Outlook Forums



Background: Regional Meteorological Telecommunication Network in Asia



Regional Meteorological Telecommunication Network for Region II (Asia)
Current status as of April 2009

ACWS Session 3: Identifying country activities, capacity and demand

For each country:

A brief overview, Then Key questions:

1) What are the current projects and activities in the countries identified?
2) What are the gaps or technical weaknesses in current provision of regional weather and climate information at national/sub-national level?
3) (Not location specific) what other relevant programmes may help to inform?

India

Summary of weather and climate service providers	Summary of weather and climate related impacts
• India Department of Meteorology •National Centre for Medium Range Weather Forecasting (NCMRWF) •Demonstration Regional Climate Centre (RCC) •Indian Institute of Tropical Meteorology (IITM)	•India is prone to all major natural hazards and **has experienced the highest number of disasters in South Asia including floods, droughts, cyclones, and landslides.**

Operational capacity of weather and climate services Advanced

• **India has a strong infrastructure in place for providing weather and climate services within the country and the region as a whole.**
• IMD has many divisions including the Agricultural Meteorology Division, the Hydrometeorological Division, the Cyclone Warning Division, the Satellite Meteorology Division and the Climate Division.
• Ministry of Agriculture, which works in close coordination with the IMD to provide agromet advisories.
• NCMRWF runs a version of the Met Office GloSea forecasting model. whereas IITM run NOAA CFS 2 models.
• National Climate Centre (NCC) is responsible for long range forecast, climate monitoring, diagnostics, and development of climate data products.

Links to regional centres (covering weather and climate) (Demo RCC Host)

•It hosts the Regional Climate Centre with responsibility for South Asia.

Delivery to national-local users inclusive of challenges and gaps Moderate

• **Work remains to be done to build a comprehensive disaster risk financing strategy**, which has assumed greater significance following recent cases of suicide amongst farmers in some states due to heavy crop losses (Pre 2015).
• The Central Water Commission (CWC) **has a website that makes hydrological and hydro-meteorological information available to the public**. There is a **need for significant improvement of the real time flood forecasting systems** including the establishment of automatic communication systems to allow the transmission of data in real time (Pre 2015).
• **Have made considerable progress in developing their agricultural advisory networks through the Internet and mobile phones**. **The major concern is the content of these agricultural advisories and their usefulness.**
• **A survey (1200 farmers) found 99% of the farmers had access to mobile phones; however, only 41% used them for purposes relating to agriculture** (2013).

Bangladesh

Summary of weather and climate service providers	Summary of weather and climate related impacts
•Bangladesh Meteorological Department (BMD) •BWDB is national hydrological agency, which uses various weather and climate information for disaster risk reduction. BWDB also established Flood Forecasting and Warning Center (FFWC) for early warning in Bangladesh.	•The geographic and climatic features of Bangladesh, coupled with its social and economic environment, make it **highly vulnerable to natural hazards including flood, drought, cyclone and earthquake**. •A robust response-oriented disaster management infrastructure exists in Bangladesh.

Operational capacity of weather and climate services **Basic to Moderate**

•The BMD provides agromet, aviation and hydrological services and some centres provide flood warnings, although there is currently a lack of trans-boundary data sharing to support this.
• Uses several NWP models and has made good advances in cyclone warning.
•The threat of increased risk caused by climate change has not been sufficiently addressed.
• There is a need to strengthen DRR initiatives and response mechanisms.
• Bangladesh Meteorological Department (BMD) has been working closely with the Met Office Hadley Centre to create a downscaled HadCM3 17-member ensemble from CMIP3 data.

Links to regional centres (covering weather and climate) **Constraints due to trans-boundary data sharing, has capacity to contribute to regional projects**

• BMD signed a bilateral agreement on Regional Integrated Multi-Hazard Early Warning System (RIMES) in March 2012
• Contributed to the 'Severe Thunderstorm Observation and Regional Modeling' (STORM) Project with the South Asian Association for Regional Cooperation (SAARC) Meteorological Research Centre (SMRC) in 2009.
• ICIMOD works on regional collaboration with focus more on the policy level yet there are constraints regarding sharing of trans-boundary data that hinder

Delivery to national-local users inclusive of challenges and gaps **Poor**

• Implementation capacity for disaster preparedness and risk reduction plans, especially at the sub-national level, is limited.
• Bangladesh early warning systems and Cyclone Preparedness Programmes (CPP) were initiated in Bangladesh after the 1970 cyclone.
• But how about to sectors? (Engaging with Tammy on Bangladesh).

Pakistan

Summary of weather and climate service providers	Summary of weather and climate related impacts
•Pakistan Meteorological Department (PMD) Cabinet Secretariat (Aviation Division) •PMD Operates a flood forecasting centre and set up the Drought/Environment monitoring and Early Warning Centre (NDMC). • The Global Change Impact Studies Centre (GCISC) Pakistan - to help national planners and decision makers with strategic policy planning. • The National Disaster Management Authority (NDMA) and Climate Services - the NDMA's capacity to prepare for and respond to disasters is limited and often dependent on external funding and technical assistance.	•Pakistan's diverse geography exposes it to a **large number of hazards, and the highly dense population that often resides in disaster prone areas makes the country highly vulnerable to adverse natural events.** **• Flood events have been the most recurrent and have had the greatest impact.**

Operational capacity of weather and climate services **Basic to moderate**

• PMD is responsible for providing meteorological and climate services throughout Pakistan.
• PMD has services in the fields of *Aviation, Agro-meteorology*, *Drought Monitoring, Hydrology*, and studies on *Renewable Energies Resource* potential across various parts of the country.
• Flood forecasting and warning activities are carried out during the monsoon season.
• Pakistan Meteorological Department (PMD) uses PRECIS and RegCM4 to downscale GCM data for seasonal forecasts and future climate projections.
• Pakistan Meteorological Department investigates the factors responsible for global warming, climate change its impact assessment and adaptation strategies in various sectors of human activities.
•Significant progress in implementing the DRR agenda has been inhibited mostly by a lack of capacity within the government, particularly at the sub-national levels, and insufficient resources.

Links to regional centres (covering weather and climate) **Links with SASCOF regional outlook forum but not very country specific**

• SASCOF provides the information about monsoon rainfall only that is very general, not area or country specific. Pakistan and Afghanistan also receive significant winter precipitation by mid-latitudinal weather systems; hence both countries should also be members of NEACOF.

Delivery to national-local users inclusive of challenges and gaps **Poor**

• **Capacity building at the national and sub-national level being poor is the main issue.**
• **Disaster risk reduction interventions are being carried out in isolation in the country till date by different departments / agencies** at national, province and district levels.
• Presently, **the provided climate information to the agriculture sector is not very useful in decision making**. Due to lack of data, knowledge and information sharing, the feedback mechanism is not effective to understand the impacts of climate change on local crops.
• **Water sector has no mechanism to measure the exact availability of available water** due to lack of water level gauges along rivers.
• **Communication Gap - Lack of coordination with stakeholders and end users**, unawareness about understanding of climate information, particularly probabilistic forecasts

Nepal

Summary of weather and climate service providers	Summary of weather and climate related impacts
• Department of Hydrology and Meteorology (DHM), Ministry of Science, Technology and Environment • The scope of work includes the monitoring of river hydrology, climate, agrometeorology, sediment, air quality, water quality, snow hydrology, glaciology, and wind and solar energy. • General and aviation weather forecasts are the regular services provided by DHM.	• In Nepal, earthquakes, **floods and landslides** are the most **frequently recurring hazards**. Floods are the source of the greatest economic loss and highest casualty rate. • **Topographical variation in Nepal is very high** and **density of hydrological and meteorological stations is poor** and data is collected manually that impacts the quality and timeliness of data that can be used for modelling purposes.

Operational capacity of weather and climate services Basic

• The Department of Hydrology and Meteorology has a basic infrastructure to generate weather and climate forecasts.
• There seems to be no national mechanism for sharing climate data.
• The existing DRR structure faces several challenges as it is limited to a reactive approach.
• The International Civil Aviation Organization (ICAO) has recognized DHM as an authority to provide meteorological services for international flights.
• Lack of skilled expertise to handle sophisticated climate data and services is also a constraint.
• Existing climate services from the government are ineffective in that they are not updated frequently.
• Flood early warning systems in Nepal are based upon observations and are not informed by meteorological forecasts.

Links to regional centres (covering weather and climate) (linkages to regional programmes, however no formal mechanisms for sharing data)

•**DHM actively participates in the programs of relevant international organisations**, such as the UNESCO's International Hydrological Program (IHP) and WMO's Operational Hydrology Program (OHP).
• **DHM is also a focal point for the Intergovernmental Panel on Climate Change (IPCC) and for the meteorological activities of the South Asian Association for Regional Co-operation (SAARC).**
• **RIMES has been supporting the Department of Hydrology and Meteorology in Nepal (capacity building, hydro-met stations, Developing National Dissemination Protocol to Communities and Users).**
• **DHM has informal agreements** - they receive real time satellite data and **information from Indian and Chinese counterparts.** However, **no formal mechanism for sharing of data.**

Delivery to national-local users inclusive of challenges and gaps Poor

• **Huge gaps exist regarding interpretation of W&C information and transmission to the local level.**
• **Linkage to agro-meteorological information to the farmers is missing.**
• **Most** of **the organizations within Nepal do not have access to useful and relevant climate data/services**. **ie There is limited link between DHM and Insurance Board.** The Ministry of Agriculture and Cooperatives who provides limited ad-hoc disaster relief for crops and livestock. Compensation for catastrophe events (e.g. floods) is usually paid in kind in the form of free seeds or other crop inputs.
• **Existing climate services from the government level are very ineffective and are not updated frequently.**
• **Users face difficulty in accessing real time data** due to lack of sufficient human resources at the sub regional level.
• **In Nepal there is lack of end to end EWS, there exists a disconnect at the local level**, government agencies lack capacity to understand the warning messages to deliver effective EWS services – Chain on Information flow is weak.

Burma (Myanmar)

Summary of weather and climate service providers	Summary of weather and climate related impacts
• Department of Meteorology and Hydrology (within the Ministry of Transport) • The Meteorological Division is responsible for supply of meteorological information, warning, news, alerts and special outlook to prevent natural disasters	• Burma is vulnerable to multiple natural hazards, such as earthquakes, cyclones, floods, tsunamis and landslides. • Rainfall induced flooding is a recurring phenomenon across the country. •The cyclonic storms originating in the Bay of Bengal are another frequent source of weather hazards in the long coastal belt.

Operational capacity of weather and climate services Basic

• Minimum basic infrastructure for providing weather and climate information services, there is a strong need for modernisation (in process).
• Rapidly changing situation with large numbers of donor projects. Requires coordination as well as general capacity building and improvements in observations and communication networks.
• In Burma, links among the climate scientists, information users and policy makers is missing.

Links to regional centres (covering weather and climate) (low levels of input from DMH)

• RIMES are conducting community-based pilot programmes for training local communities to prepare for and respond to early warnings received from DMH and RRD.
• The regional linkages of DMH is with ADPC, RIMES, UNESCAP, SASCOF, SEASCOF- there are however windows for improvement and most crucially, the active participation of Myanmar DMH in the discussions.

Delivery to national-local users inclusive of challenges and gaps Very Poor/Poor

• **Development partners would like to have more general information related to priority investment areas on climate change** by national partners along with sectors and available funding by donors.
• **Organisations focused on DRR would appreciate pro active sharing and dissemination of climate related information guidance and learning's** from responsible global, national and local agencies with trainings provided so that information meets the minimum quality and are available.
• In compliance with UNFCCC, Burma claims to have paid special attention to enhance education and awareness of public on climate change through trainings and various means. In 2015 survey this was thought not to be the case.
• **The communication channels and dissemination of the information is a challenge that DMH and RRD constantly face.**
• **The rural part of the country has no reliable access to any of the communication channel of W&C services.** Not a major bulk of population use cell phones either.
• **There is no clear climate services system plan/roadmap, leads to confusion between departments and ministries.**

Afghanistan

Summary of weather and climate service providers	Summary of weather and climate related impacts
• Afghan Meteorological Service (within Ministry of Transport and Civil Aviation) • The AMS is responsible for producing climate information •There is an urgent need to put in place the basic minimum weather and climate information services and response mechanisms.	• Afghanistan's rugged mountain landscape and generally arid climate make it prone to several natural hazards, particularly drought and floods. • Parts of Afghanistan (Northeast) are extremely vulnerable to Landslides during winter's and spring's rain and to Flash Floods during spring's and summer's rain. • Afghanistan is mostly affected by mid-latitudinal weather systems coming from the west during the whole year.

Operational capacity of weather and climate services Less than Basic

• Formerly a well-developed met service - today its infrastructure, instruments and historical climate data have been severely depleted.
• A comprehensive ten-year capacity development programme for the AMS has been drawn up by UK Met Office in partnership with International Security and Assistance Force (ISAF) and DFID. This included facilitation of a stakeholder working group at the British Embassy in Kabul (Met Office 2012). (status?)
• A Met Office assessment indicated 'very limited operational capacity' and ad-hoc project by project capacity development as unsustainable (Met Office, 2012).

Links to regional centres (covering weather and climate) Some linkages (interaction low)

• **Interaction between the NHMS and regional/international organisations is considered low.**
•Famine Early Warning System Network (FEWSNET), using satellite imagery to provide weekly reports on climate changes used to monitor variability and to signal impending changes/project crises.
• NDMA of Pakistan is building the capacity of ANDMA (Afghanistan National Disaster Management Authority) by providing technical support and trainings.
• The United Nations Assistance Mission in Afghanistan (UNAMA) and ADB has collaborated with the Government of Afghanistan and other partners to develop a National Plan for Disaster management and a Strategy for Institutional Strengthening in Risk Management.
• Afghanistan should be a member of NECOF?

Delivery to national-local users inclusive of challenges and gaps Very Poor

• Organizations working at the community level such as the Afghan Red Crescent Society have provided training in hazard assessment and mapping to community volunteers in order to assist in the preparation of plans.
• **The Government of Afghanistan is not well prepared for natural disaster emergencies**, relies heavily support of international community.
• **Early warning systems are non-existent** and comprehensive risk assessments have not been undertaken at any level.
• **Due to lack of climate information, the crop choice availability is limited** and sometimes the potentially productive land is left uncultivated.
• **Most of the small and poor farmers and the policy makers are not aware about the agriculture potential** of the country and about the changing climate.
• **Lack of historical climate data and information is a main stumbling block** to provide any support to end-users in decision-making.

Tajikistan

Summary of weather and climate service providers	Summary of weather and climate related impacts
• National Agency for Hydrometeorology (also responsible for Hydrology) part of the Committee on Environmental Protection • Functioned by Law of the Republic Tajikistan on Hydrometeorological Activities 86, 02/12/2002	• Snowmelt is a major contributor to water resources as well as flood (related) hazards...mudslides, avalanches etc...similar to many mountainous countries in central Asia.

Operational capacity of weather and climate services **Less than Basic**

• Provides Basic traditional meteorological Services with poor forecast accuracy / and low trust by public, Tajik Government and stakeholders. For example, aviation meteorological services are provided by the State Unitary Enterprise 'Tajikairnavigation' rather than Hydromet due to the flight safety requiring greater accuracy and reliability than Hydromet were (perceived to be) able to provide.

Links to regional centres (covering weather and climate) **Some linkages, low interaction**

• NWP output is accessed from modeling centres ECMWF and Deutscher Wetterdienst (DWD) COSMO.
• The WB in association with the Global Facility for Disaster Risk Reduction (GFDRR) and the WMO are working with Hydromet as well as other NMHS in Central Asia to develop and implement a Central Asia Regional Flash Flood Guidance System (CAFFGS)
• Lack of sharing information across boundaries / poor relationships with neighbouring countries, inward looking culture / mindsets
• Pilot projects such as WMO. 2017. Central Asia Region Flash Flood Guidance (CARFFG) System.

Delivery to national-local users inclusive of challenges and gaps **Very Poor**

• There is a stakeholder survey underway (ADB project) with a list of 60 participants – hopefully get response in time to feed into report.
• Limited observations, with no regular telemetered river gauge information
• Low accuracy of forecasts
• Lack understanding of user's needs
• Key challenge: low funding/staffing/equipment of NHMS
• Low morale and low pay (linked)
• Exceptionally limited climate program
• Little understanding about how/what/when the involvement of stakeholders/providers/users in the development of W&C information and services.