SEVERE WEATHER FORECASTING
DEMONSTRATION PROJECT A SUB
PROJECT FOR EASTERN AFRICA

Vincent N. Sakwa
Regional Specialized Meteorological
Centre, Nairobi, Kenya
Kenya Meteorological Department
Outline

• Mandates of NMHSs
• Vision of SWFDP
• Goals of SWFDP
• SWFDP Regional Sub-projects
• SWFDP Development & Implementation cycle
• SWFDP Cascading Forecasting Process
• SWFDP links and synergies
• SWFDP – Eastern Africa – Lake Victoria
• Benefits
• Summary
Scenario

- Well distributed rainfall amounts
Scenario

• Well distributed rainfall amounts
Scenario

- Well distributed rainfall amounts
Scenario

- Well distributed rainfall amounts
Scenario

- Poorly distributed rainfall amounts
Scenario

- Poorly distributed rainfall amounts
Scenario

• Poorly distributed rainfall amounts
Scenario

• Too much rainfall amounts
Scenario

• Too much rainfall amounts
Scenario

• Too much rainfall amounts

Mandate of NMHSs: To provide weather/climate information for the safety of life, protection of property and conservation of the environment.
Vision of SWFDP

Improving severe weather forecasting and warning services in developing countries

“NMHSs in developing countries are able to implement and maintain reliable and effective routine forecasting and severe weather warning programmes through enhanced use of NWP products and delivery of timely and authoritative forecasts and early warnings, thereby contributing to reducing the risk of disasters from natural hazards.”

(World Meteorological Congress, 2007 and 2011)

Strategic Priorities of WMO

☑ Disaster Risk Reduction
☑ Capacity Development
☑ Climate change adaptation
The Challenge is mitigating the growing technological gap in weather forecasting

- Dramatic developments in weather forecasting science over the past two decades – advances in monitoring and NWP and Ensemble Prediction Systems (EPS),
- leading to improved alerting of weather hazards, at increased lead-times of warnings
- Developing countries, LDCs, saw little progress due to limited budgets, failing infrastructure, inadequate guidance and expertise,
- increasing gap in application of advanced technology (NWP, EPS) in early warnings
- WMO SWFDP attempts to close this gap by increasing availability, and developing capacity to use existing NWP and EPS in countries where it is not effectively used
SWFDP Main Goals

- Improve Severe Weather Forecasting through the “Cascading Forecasting Process” (Global → Regional → National → Users)

- Improve lead-time of Warnings

- Improve interaction of NMHSs with users

- Identify areas for improvement and requirements for the Basic Systems

- Improve the skill of products from WMO Operational centres through feedback
SWFDP Development and Implementation: a 4-step cycle

• Establish regional partnerships
  - Regional management teams; focus on forecasting and warning services of meteorological-related hazards

• Planning and development of prototype demonstration project
  - Regional project-specific IP for which the management team is accountable. IP describes team members’ responsibilities, project activities and milestones (typically for 12-18 months)

• Implement demonstration project
  - Tracking, continuous evaluation, training and reporting

• Broaden and sustain successful prototypes
  - (return to step 1)

Under the Guidance of the Steering Group of the SWFDP
SWFDP Regional Projects

- **Southern Africa** (ongoing; 16 countries; RSMC Pretoria, RSMC-TC La Réunion)
- **Southwest Pacific Islands** (ongoing; 9 Island States; RSMC Wellington, RSMC-TC Fiji)
- **Eastern Africa** (ongoing, 6 countries; RSMC Nairobi, RFSC Dar es Salaam)
- **Southeast Asia** *(in development, 5 countries; RFSC Hanoi)*
- **Bay of Bengal** *(in development, 6 countries; RSMC-TC New Delhi)*
  - WMO global and regional operational centres (e.g. RSMCs)
  - 42 NMHSs of developing countries (29 of which are LDCs/SIDSs)
  - Several WMO programmes (i.e. GDPFS, PWS, TCP, DRR, MMO, AgM, SP, ETR, CD, LDC, RP, and WWRP) and technical commissions (i.e. CBS, CAgM, CHy, JCOMM, and CAS)
SWFDP Cascading Forecasting Process

- **Global NWP** centres to provide available NWP and EPS products, including in the form of probabilities, cut to the project window frame;
- **Regional centres** to interpret information received from global NWP centres, prepare daily guidance products (out to day-5) for NMCs, run limited-area model to refine products, maintain RSMC Web site, liaise with the participating NMCs;
- **NMCs** to issue alerts, advisories, severe weather warnings; to liaise with Disaster Management, and to contribute feedback and evaluation of the project;
- **NMCs** have access to all products, and maintain responsibility and authority over national warnings and services.
SWFDP links and synergies

Flash Flood Guidance

HWR

AgM, MMO, AeM, etc.

Guidance Products (risk/probability)

RSMCs-TC

Regional Centre

TC

Tailored Forecasting Products for Specialized Applications

Global NWP/EPS and Sat-based products

Global Centres

SMDs-TC

Regional Centre

National Met Centres (Forecast D/D+5; Bulletins)

Guidance Products (risk/probability)

TC

National Met Centres

E-mail; etc.

Specific Comm. Systems

SMS; Weather Radio Systems; Public Web; etc.

Radio; TV

Specific Communication Systems

WMO

Satellite Imagery and Tools

Research Projects

Observing and information systems

WMO SP

WWRP

Disaster Management and Civil Protection

PWS

Specific Comm. Systems

General Public and spec. users (Agriculture, Marine, Fisheries, Safety, Aviation, etc.)
Focus on:
- Strong winds
- Heavy precipitation
- Hazardous waves
  (Indian Ocean and Lake Victoria)
- Dry spells

Users: general public, disaster management, media, agriculture and fisheries

Domains:
- 5E – 55E; 30N – 25S
  (for monitoring, analyzing, predicting and verifying the various severe weather events)
- 31E – 36E; 2N – 4S
  (for the Lake Victoria)

Global Centres: ECMWF, UKMO, NOAA/NCEP
(NWP guidance material)

MSG satellite products (EUMETSAT products)

Regional Centre: RSMC Nairobi, supported by TMA, UKMO and DWD

National Met. Centres: Kenya, Tanzania, Uganda, Burundi, Rwanda and Ethiopia

Phase 1: Started September 2011 till February 2013

Phase 2: Commenced March 2013 to date
SWFDP – Eastern Africa
6 countries, RSMC Nairobi, RFSC Dar-es-Salaam, Met Office UK, NCEP USA, ECMWF, DWD
Benefits

• **Improved accuracy** in the weather forecasts, alerts and advisories
• **Capacity development**
  – Enhanced **skills and competencies** (Forecasters and Non-forecasters)
  – Improved **computing/ICT** facilities
  – Improved **dialogue** among the “Expert Group”
• Created a “**critical-mass**” of champions at all levels (Sectors)
• Created a platform for **data/product/information sharing**
• Created **confidence** among the weather/climate producers and users
• Forecasters appreciated the **usefulness** of the NWP products
• Improved **lead-time** of warnings, advisories and alerts
• Improved **service delivery**
SWFDP - SUMMARY

• SWFDP is a success story whereby developing countries can be assisted to reduce the technology gap in weather forecasting, to support operational severe weather forecasting and warning services

• SWFDP contributes to achievement of the MDGs:

<table>
<thead>
<tr>
<th>MDG</th>
<th>Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDG 1</td>
<td>ERADICATE EXTREME POVERTY &amp; HUNGER</td>
<td>Enhancing food security</td>
</tr>
<tr>
<td>MDG 4</td>
<td>REDUCE CHILD MORTALITY</td>
<td>Reducing the under-five child mortality rate</td>
</tr>
<tr>
<td>MDG 7</td>
<td>ENVIRONMENTAL SUSTAINABILITY</td>
<td>Reducing the biodiversity loss and environmental degradation</td>
</tr>
<tr>
<td>MDG 8</td>
<td>GLOBAL PARTNERSHIP</td>
<td>Addressing the special needs of LDCs, Developing, landlocked countries and small island developing states</td>
</tr>
</tbody>
</table>
Thank You/ Asante sana