WMO Public Weather Services

Regional Workshop on Impact-Based Forecasts in WMO RA II

> Korea Meteorological Administration Seoul, Republic of Korea 7-9 November, 2017



Miriam Andrioli Chief SDD/WDS

World Meteorological Organization Organisation météorologique mondiale

Public Weather Service

≻Need

To protect lives and livelihoods; beneficial to the nation's economy and welfare of citizens; improves situational awareness, decision-making and planning; strengthens the <u>authoritative voice</u> of NMHSs; supports <u>attribution</u> to NMHSs as service providers.

➤ 1994, WMO creates the Public Weather Service Delivery Div. (Weather and Disaster Risk Reduction Services Dept.)



Public Weather Service

- Develop capacity for Impact Based forecasts and Warning services;
- Establish and improve <u>multiple channels of communication</u> of Weather forecasts and warnings;
- Provide training on working with the <u>Disaster Management community</u> and stakeholders;
- Encourage the <u>international exchange</u> of forecasts and warnings.
- Develop capacity to provide warnings in the Common Alerting Protocol (CAP)
- ➤ WMO PWS/SDD w/c **Tropical Cyclone Programme** (TCP) and the **Severe Weather Forecasting and Demonstration Project** (SWFDP) of WMO.



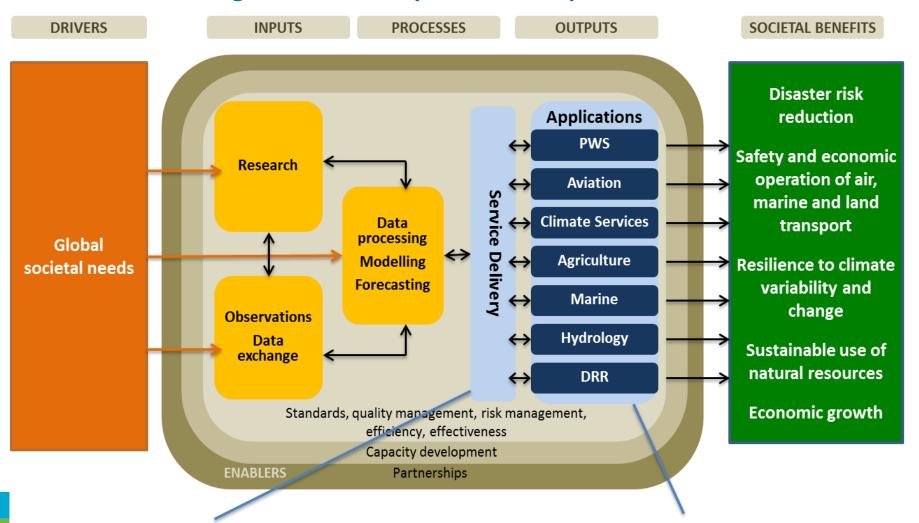
Public Weather Service

≻Users

- General Public
- Stakeholders in major thematic areas for application
 - National Offices with a warning function, governmental entities and Crisis Committees, Civil protection, EMA, etc.
 - Marine, coastal, aviation, agriculture, transport, energy, hydrology, water resource management, health, urban & megacities authorities, insurance, traditional and digital media, tourism, infrastructure planners, etc.



Positioning Service delivery within the Operational Structure of WMO



Develop a separate service delivery area which can be utilised better by

all the application areas.

MMO OMM

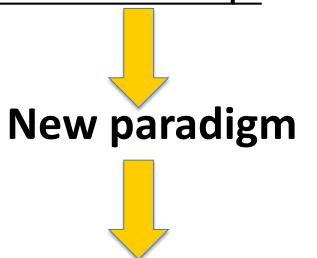
very
Establish flexible application areas which can
er by
grow or shrink in number and size.

Application and services are hub for the linkages between the core business/function based business and the global societal benefits and relevant goals of UN Agendas

Public Weather Service - Service Delivery

>Extremely relevant demands in a

New evolving digital Information landscape in a world of Digital natives



- **Evolution** in Service Delivery (SD) Process both in
 - Culture



Workforce Skills & Capabilities

➤ While best practices for SD exist around the globe, generally speaking the current focus has been on **producing a product** rather than a <u>service culture</u> based on <u>user needs and demands</u>.

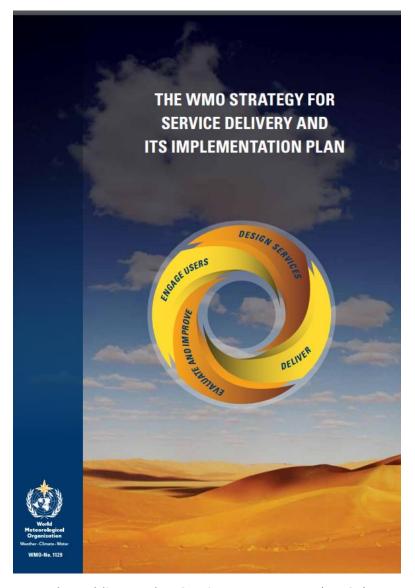
NMHSs need assistance from WMO to change the SD paradigm:

✓ Thorough comprehensive WMO Strategy for Service Delivery has been developed;

√ Implementation Plan - Service Delivery Progress Model (SDPM)



The WMO Strategy for Service Delivery





The Public Weather Services Programme (PWSP)



WMO –NMHSs working together to develop a service delivery foundation, adaptable **to fit different needs** in the provision of **user-focused** weather, climate, water and environmental services.

Product oriented



User oriented

Fit-for-purpose products, tailored to meet user needs



The four stages of a continuous, cyclic process for developing and delivering services are:



Fit-for-purpose products, tailored to meet user needs



The six elements necessary for moving towards a more service-oriented culture are:

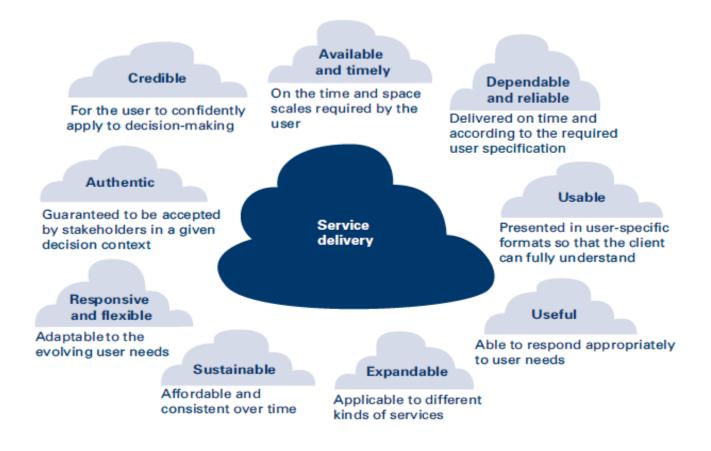
1 Evaluate user needs and decisions

- 4 Sustain improved service delivery
- 2 Link service development and delivery to user needs
- 5 Develop skills needed to sustain service delivery
- 3 Evaluate and monitor service performance and outcomes
- 6 Share best practices and knowledge

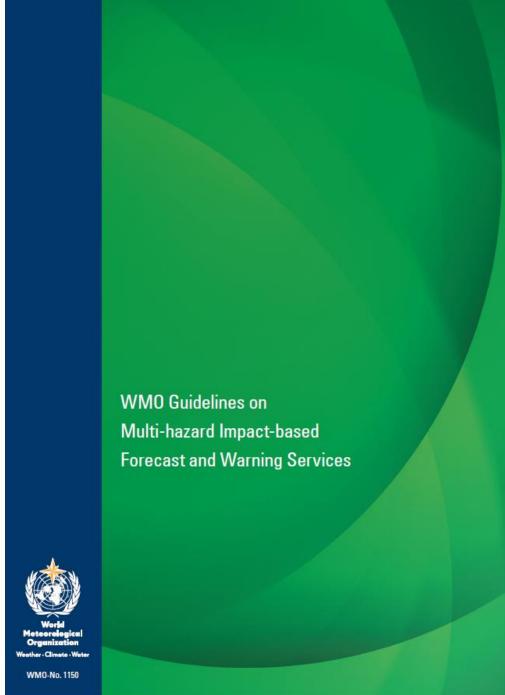
Fit-for-purpose products, tailored to meet user needs



Public Weather Service Delivery attributes









WMO Guidelines on Multi-hazard Impact-based Forecast and Warning Services

Available online: http://library.wmo.int/pmb_ged/wmo_1150_en.pdf

World Meteorological Organization

Published by: WMO; 2015

- Improves the understanding of the <u>potential impacts</u> of severe hydrometeorological events, certainly a challenge to NMHSs and their partner agencies, particularly disaster reduction and civil protection agencies (DRCPAs).
- Establishes a road map that identifies the various milestones <u>from weather forecasts</u> and <u>warnings</u> to <u>multi-hazard impact-based forecast and warning services</u>.
- Describes the <u>ultimate step of forecasting actual impacts</u>, although it is recognized that this is a highly sophisticated exercise, requiring strong collaboration with partner agencies and significant research into <u>exposure and vulnerability</u>.
- For many WMO Members this step will not be the responsibility of the NMHS but rather that of the relevant DRCPA and other partners.



CONTENTS

	Page
EXEC	CUTIVE SUMMARYv
CHAI	PTER 1. THE CASE FOR IMPACT-BASED FORECASTING
1.1	Coping with hydrometeorological multi-hazards
1.2	Desired outcomes
1.3	Impact-based forecasting
	PTER 2. KEY CONCEPTS IN IMPACT-BASED AND IMPACT FORECAST AND
	NING SERVICES4
2.1	Hazard
2.2	Hydrometeorological forecast uncertainty
2.3	Exposure
2.4	Vulnerability
2.5	Risk
2.7	Service delivery partnerships: public and government responsibility
2.7	service delivery parties inps. public and government responsibility
	PTER 3. EVOLVING TOWARDS IMPACT FORECASTING
3.1	General forecasts
3.2	Warnings based on fixed meteorological thresholds
3.3	Weather warnings using relevant thresholds agreed with users/practitioners
3.4	Weather warnings with spatial/temporal variation in thresholds
3.6	Impact forecast and warning services
3.7	Schematics depicting conceptual and operational applications of impact
3.7	forecasting
3.8	Benefits of an impact warning service
	PTER 4. RECOMMENDED ELEMENTS IN THE DEVELOPMENT OF IMPACT
	CAST AND WARNING SERVICES
4.1 4.2	Partnerships
4.3	Functional requirements for impact-based forecasting and warnings
4.4	Developing the capacity of National Meteorological and Hydrological Services
	staff and partners
4.5	Validation
CHAPTER 5. OVERARCHING MANAGEMENT APPROACH FOR EVOLVING TOWARDS IMPACT PASED AND IMPACT FORECAST AND WARNING SERVICES 21	



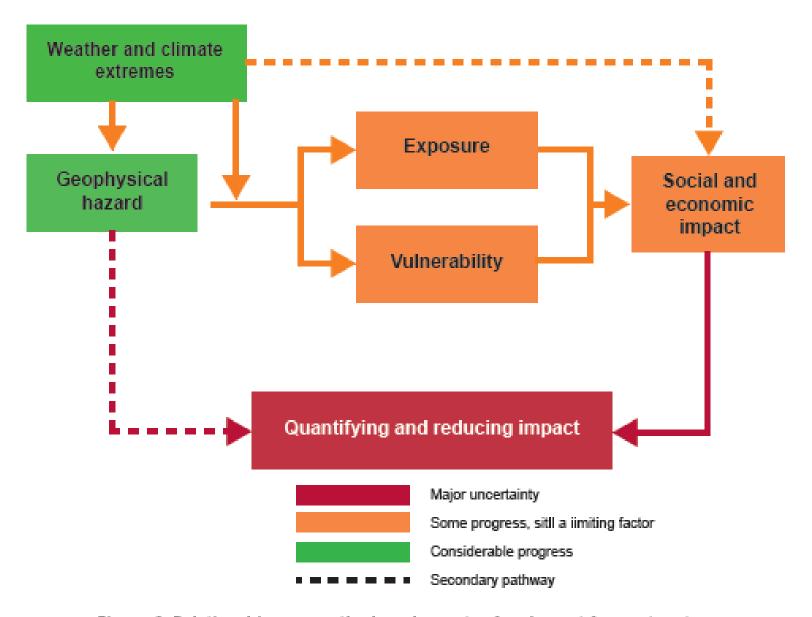


Figure 1. Relationship among the key elements of an impact forecast system



Workshop on IBF in RA II

Goals to accomplish

- Encourage Best Practices
- Promote Study Cases
- Identify potential priorities for further IBF Workshops
- Produce feedback material for WMO CBS-OPAG PWSD and WDS/SDD.



Thank you



World Meteorological Organization Organisation météorologique mondiale