



WORLD BANK GROUP

Strengthening Forecasting Services in Developing Countries

Daniel Kull
Senior Disaster Risk Management Specialist
Geneva, Switzerland

Hydromet: An integral part of sustainable development

Up to **US\$30**
billion a Year

in improved global productivity can be achieved with better weather, climate, and hydrological observation and forecasting.

Up to
\$2 billion

in reduced global annual asset losses can also be achieved with better hydromet services, according to the World Bank.²

What are the needs?

- **Conservative estimate of high priority hydromet modernization investment needs in developing countries exceeds USD 1.5-2 billion**
- ***Minimum USD 300-400 million per year is necessary to support operations of the modernized NMHSs systems***
- **International support and investment efforts in NMHSs modernization in developing countries so far has been insufficient and not always effective**



GFDRR Hydromet program

GFDRR Hydromet Program plays a role of a focal point and service center to mobilize resources, guide and support large investments in hydromet modernization. The Program has three pillars:

- ❖ Capacity Building
- ❖ Analytical Support and Knowledge Management
- ❖ Technical Assistance



From here...



... to something closer to this

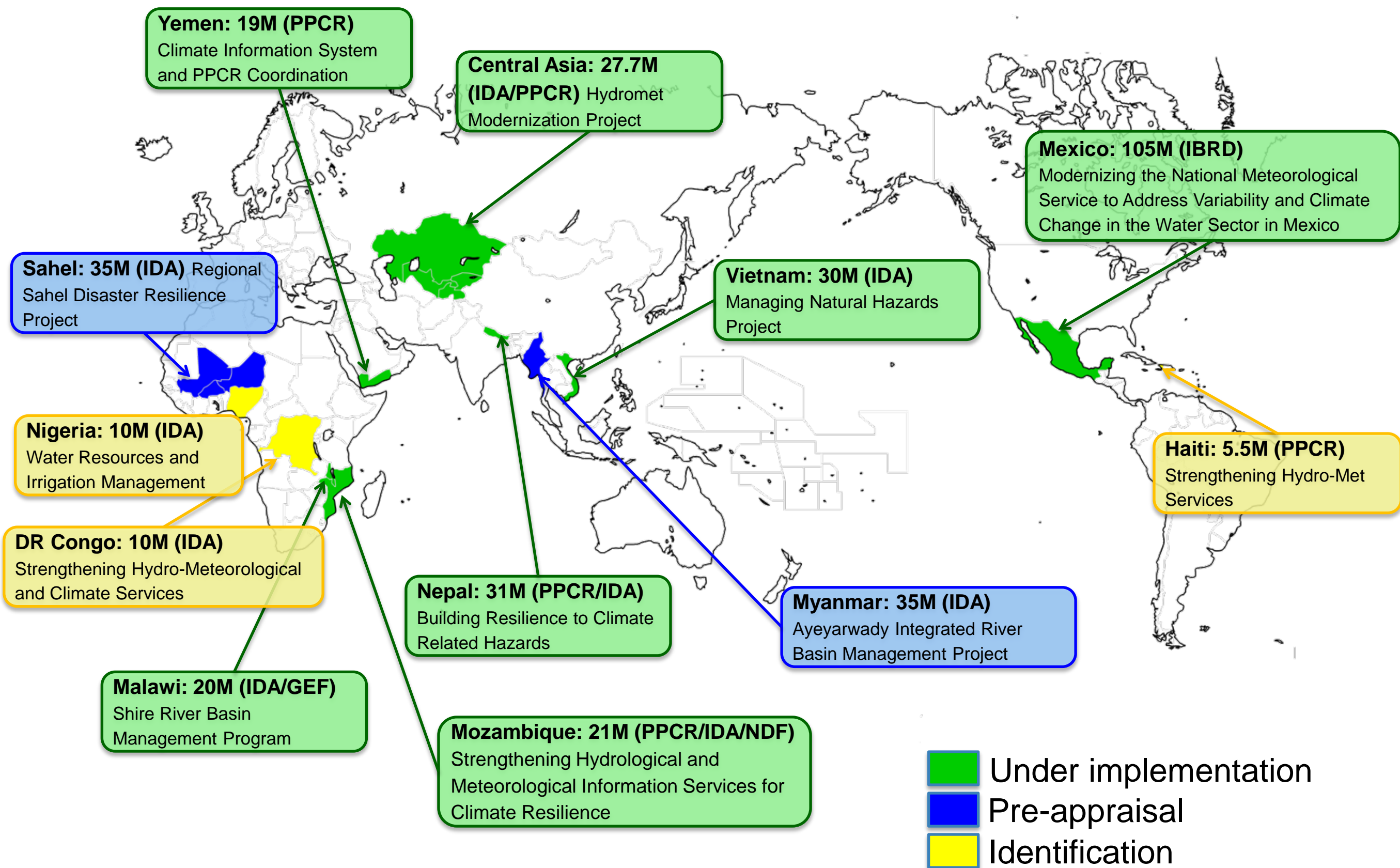


Guiding Principles of GFDRR Hydromet Program

Objective: Enhanced capacity of NMHSs to deliver reliable, timely and accurate information and services

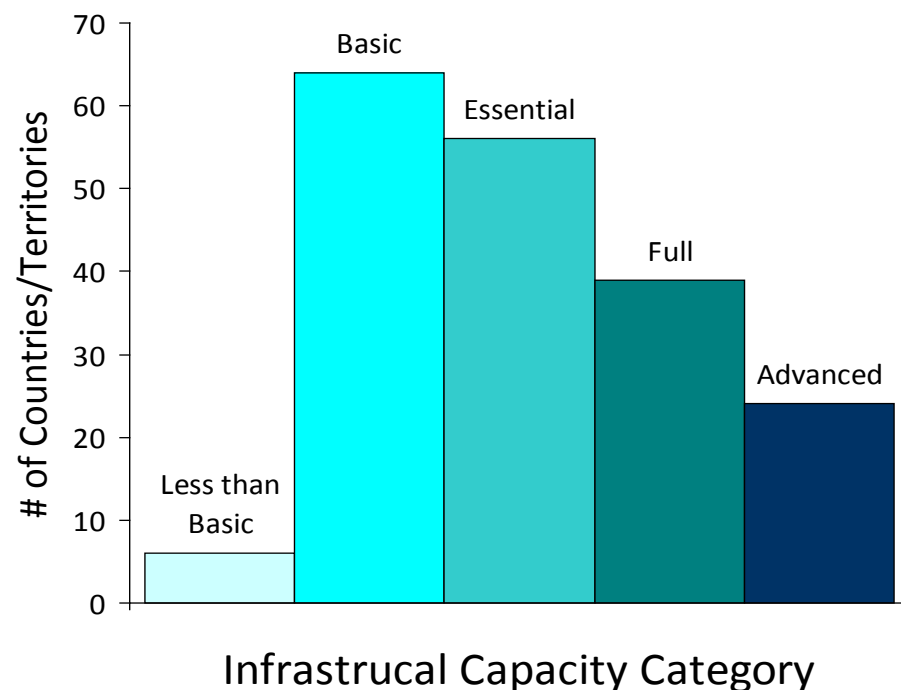
- Identify, enable and support investment in hydromet services (NMHSs)
- Facilitate integrated approach with focus on institutional strengthening and capacity building, modernization of observing infrastructure and forecasting, and enhanced service delivery system
- Facilitate more effective partnerships with WMO, leading NMHSs and donor community
- Jointly with WMO provide better access to global products, best practices and expertise
- Ensure alignment with Global Framework for Climate Services (GFCS) and other global initiatives
- Provide access to funds for operational guidance and support through “twinning arrangements” with leading NMHSs and WMO
- Secure government commitment to increase NMHSs sustainability

Example Investments



Global Support to National Forecasting Needs

- Provision of reliable, timely and accurate forecasts is a global endeavor.
- Needs: world-wide, real-time collection and exchange of weather observations; processing; trained meteorologists and hydrologists to prepare and disseminate forecasts; user-focused delivery.



*Infrastructural Capacities of Countries
as of Aug 2010 to provide Basic, Essential,
Full and Advanced Meteorological Services*

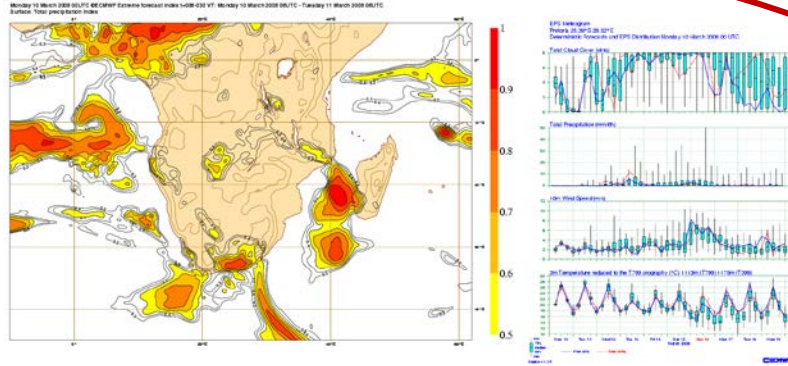
Source: WMO

- Many NMHSs have little or no capability to do this.
- Cost-effective and sustainable ways needed in which investment can build capacity in the NMHSs to enable them to provide service.

Example: Cascading Forecasts through SWFDP



*Global
NWP
Centres*



*Regional
Centres*



NMHSs

Colour coding	Green	Yellow	Orange	Red
Mean Wind	0 – 5 KT	6 – 10 KT	11 – 20 KT	Over 20 KT
Wind gusts	5 – 10 KT	11 – 20 KT	21 – 30 KT	Over 30 KT
Thunderstorms	Light	Moderate	Strong	Severe
Visibility	> 1 Km	500 – 1000 m	100 – 500 m	< 50 m
Response Level	Appropriate individual response under BAU.	Some multi-agency response but mostly BAU.	Multi-agency response needed.	Multi-agency Strategic response needed, mutual aid necessary perhaps national co-ordination.
Implications for users of Lake Victoria	Business as Usual (BAU)	Forecast weather may lead to hazardous conditions. Be aware	Weather conditions are likely to lead to hazardous conditions. Be prepared should the situation worsen	Weather conditions will lead to life threatening conditions on the Lake. Take action.
Public Advice	Nil	Be Aware	Be Prepared	Take Action

Users

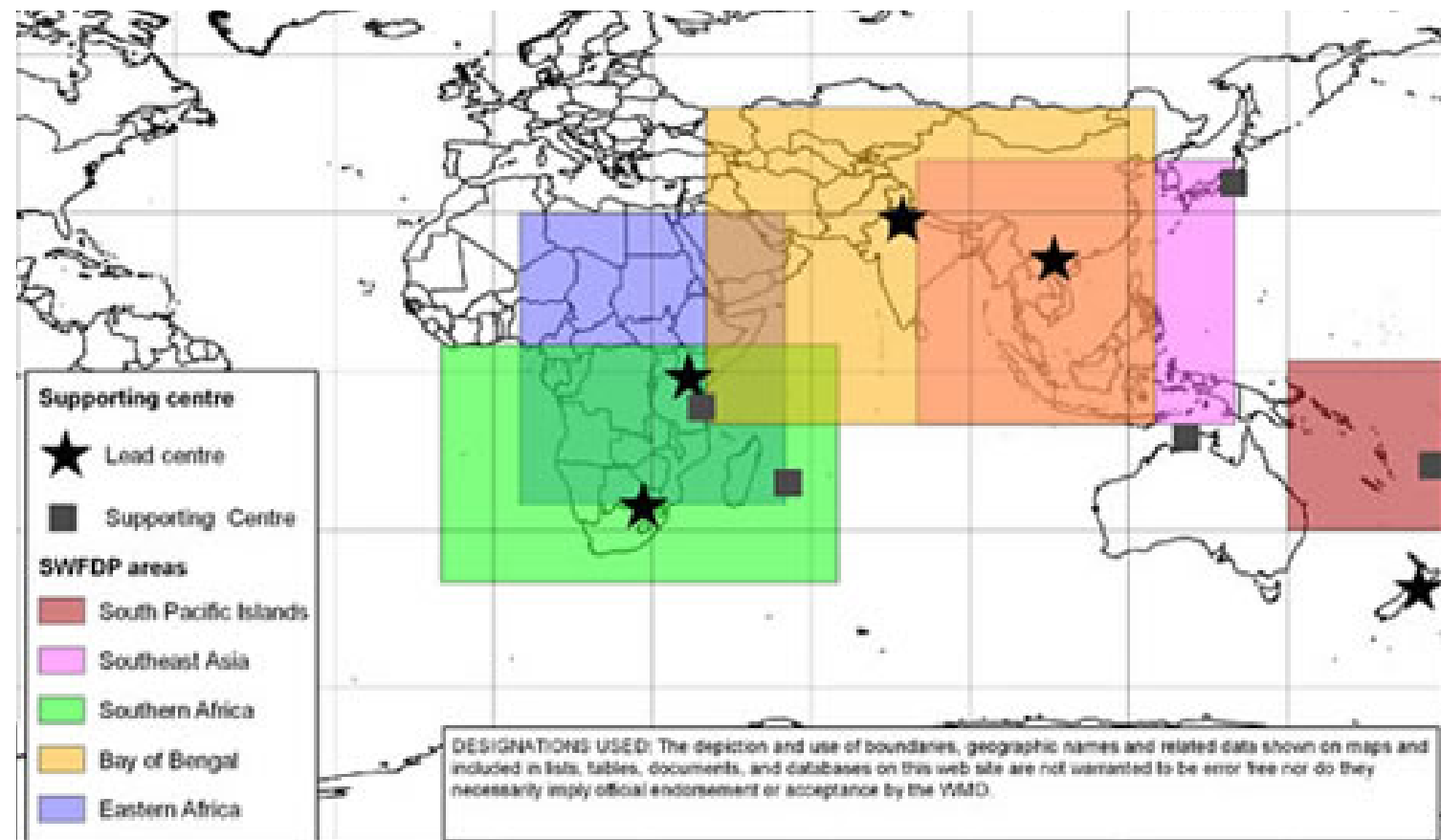


SWFDP Southern Africa (since 2006)



Added Value of Cascading Forecast Approach

- Improved quality of national forecast and warning services
- Enhanced visibility and reputation of NMHSs
- Increased forecaster confidence and capability within a context of evolving roles
- All countries can benefit from advances in forecasting techniques and technology
- Development of operational partnerships between meteorologists, hydrologists and disaster managers
- Development of operational partnerships between global, regional and national centres



Example: KyrgyzHydromet



2010

3-day forecasting
accuracy = 60-65%

2011

Started receiving
NWP from JMS

2012

Started receiving
NWP from ECMWF

2013

3-day forecasting
accuracy = 75-85%

Central Asia Hydrometeorology
Modernization Project (CAHMP)

Conditions for Sustainable Success

- Regular capacity building and training can be maintained for new forecasters along with refresher training for experienced forecasters
- Regional centers are able to maintain an interpretation and guidance service on a similar long-term operational basis
- Global centers remain able to support the provision of relevant products on a long-term operational basis

Currently global NWP services depend on the largesse of the providers

- Not financially sustainable
- Not sufficiently reliable to ensure long-term service delivery
- Services would be substantially better if incremental and stable investment were assured
- All countries should be able to benefit from these services which deliver significant global value as a public good
- We should not expect the incremental cost of services to be borne by global centers' host/member countries

Analytical Work to Support Pragmatic Solutions

Weather and Climate Resilience (2013)

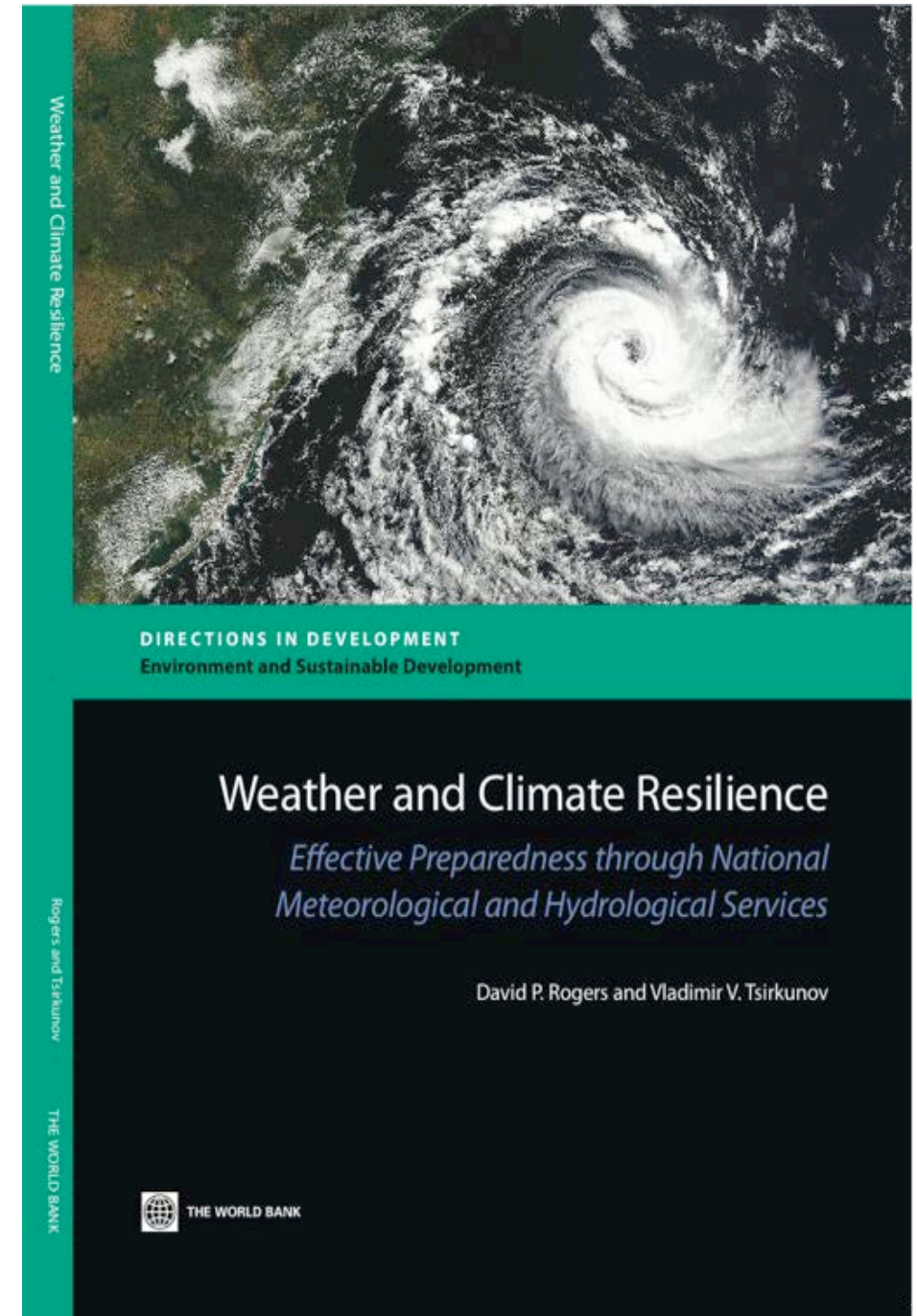
- ✓ Summary of GFDRR experience
- ✓ Recommendations for designing hydrometeorological modernization projects

Forecast Value: Economic Assessment of Meteorological and Hydrological Services (2014)

- ✓ World Bank/GFDRR-WMO-USAID Publication
- ✓ Guidance for planning, performing, utilizing and communicating socioeconomic benefit analysis to strengthen met/hydro services

Future areas of exploration (>2014)

- ✓ Improving social resilience by forecasting weather impacts
- ✓ Sustainable financing of global climate services for the public good



An aerial photograph of a swimming pool with a white border and blue water. The pool is surrounded by a brown deck with various outdoor furniture, including lounge chairs, a table, and potted plants. A blue pool pump is visible on the left side of the pool. The text "Questions for clarity?" is overlaid in yellow on the pool's surface.

Questions for clarity?