Identifying interventions to improve NMHS capacities based on GFCS pillars and associated metrics

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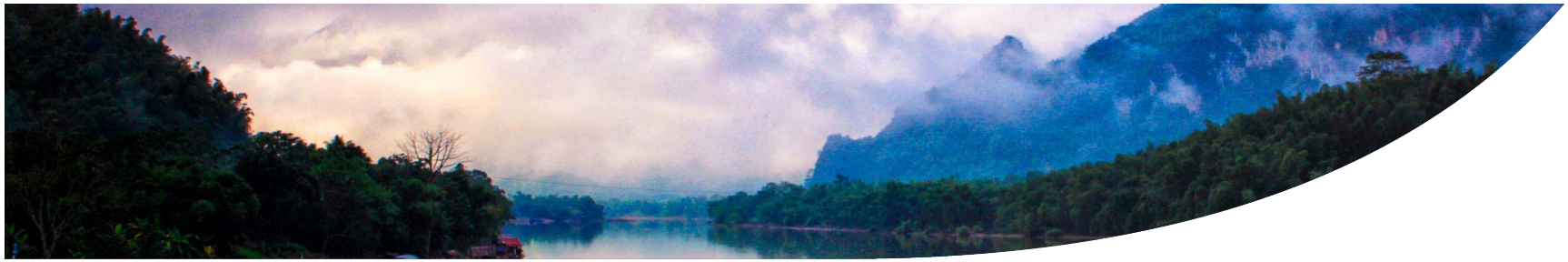
GFCS
Global Framework for Climate Services

World Meteorological Organization

CILSS



Methodological steps assessing capacity

Situation/baseline assessment; identify NMHS existing capacities within GFCS pillars

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Metrics associated with each GFCS pillar used to categorise NMHS: 1 (basic), 2 (essential) and 3 (full)

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Recommended capacities: **essential capacities** required for current category, and **desirable capacities**: those required for the subsequent category

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Prioritization of capacity needs based on their impact and feasibility

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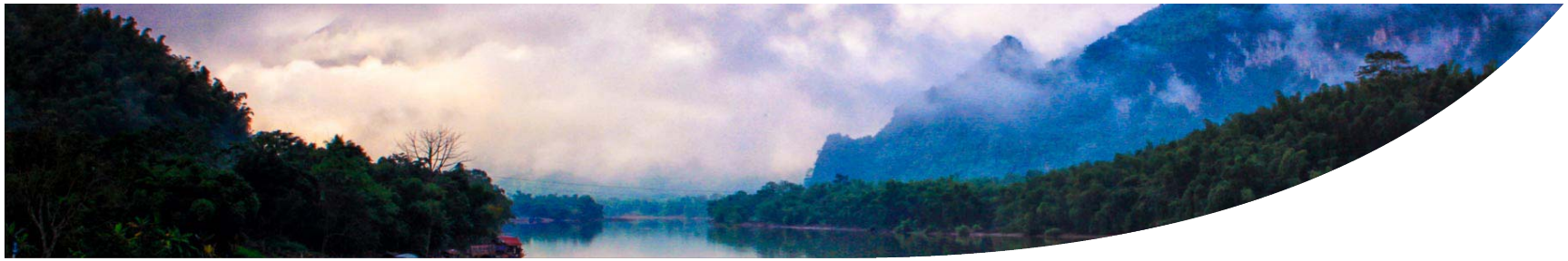
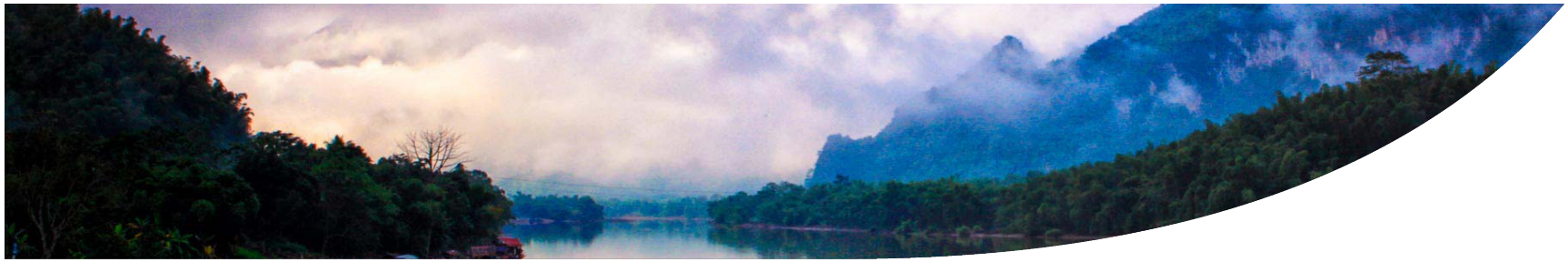
Identify interventions to assist in the achievement of each prioritized capacity need



Observations and monitoring (metrics: surface and upper air monitoring, data QA/QC, data rescue, remote sensing)

GFCS Pillar	NMHS Category	Senegal	Cote d'Ivoir	Niger	Mali	Rwanda	Ethiopia	Malawi
1 Observations & Monitoring	Requirements 1							
	Requirements 2							
	Requirements 3							

Common Weaknesses	Suggested Interventions
Density of upper-air observations	Expand stations in key locations based on O&M costs/ impact
Density of surface stations (except Rwanda)	Expand based on O&M costs, function and key scientific regions e.g. high vs low altitudes
WMO/GCOS/WIS data standards	Training technicians and equipment for reporting
Use of satellite data	Satellite data low cost option to expand coverage for early warning and agrohydrological applications.



Research, modelling and predictions (participate in research, medium-term weather forecasts, disseminate climate outlooks, national weather/climate research, sub-seasonal forecast products)

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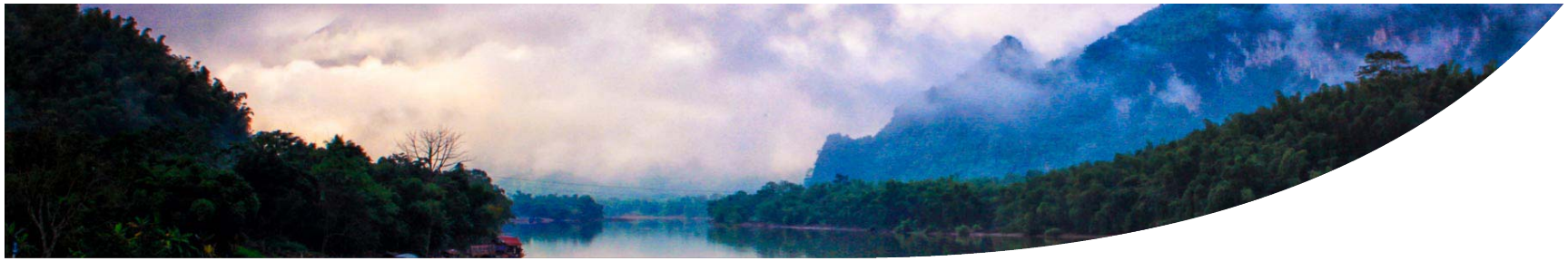
2 Research modelling and predictions	Requirements 1							
	Requirements 2							
	Requirements 3							

Common Weaknesses	Suggested Interventions
Seasonal temperature outlooks	Include statistical and/or dynamical forecasts
Number of PhD researchers	Increase available bursaries and staff
Access to downscaling tools	Training on statistical/dynamic methods (depending on existing capacity)
Access to sufficient bandwidth	Increase bandwidth to min 10 Mbs^{-1}



Climate Services Information System (advanced statistical analyses, climate watch & EWS, feedback from users, multidisciplinary and tailored analyses, NAP and policy relevant info.)

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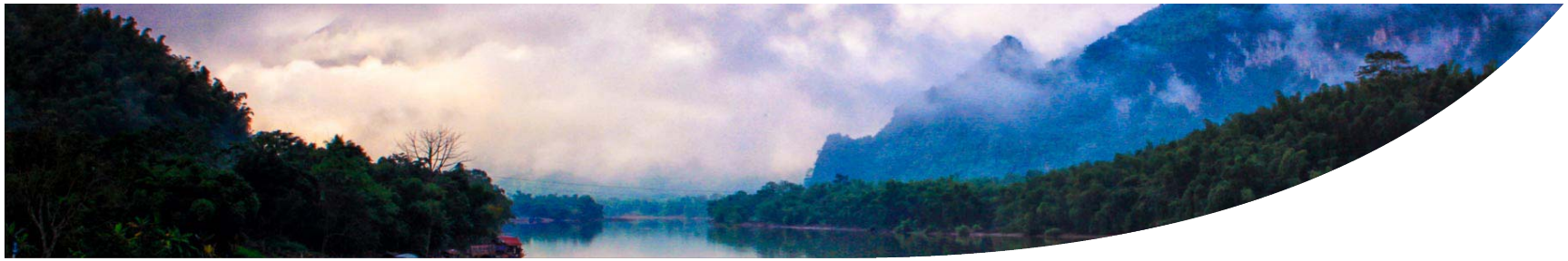
3 Climate services information system	Requirements 1							
	Requirements 2							
	Requirements 3							

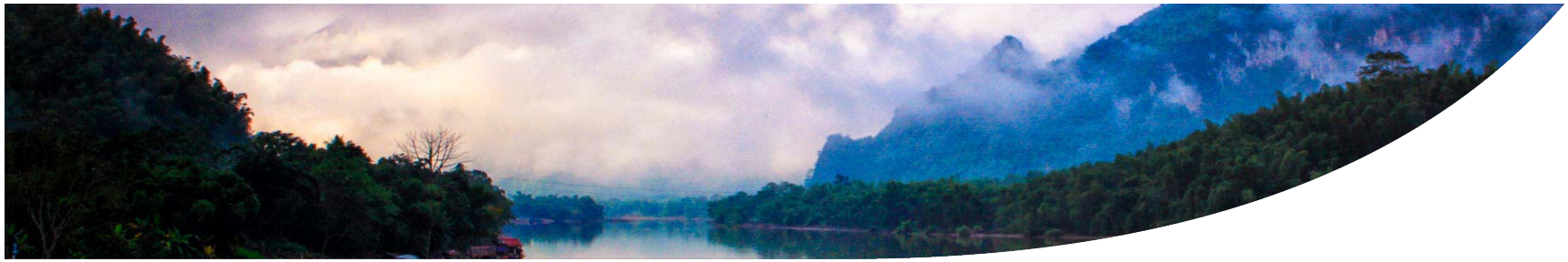
Common Weaknesses	Suggested Interventions
Software and production climate statistics	Training on open source (R, python) tools (depending on existing software)
Data homogeneity testing	Use changepoint analyses on data e.g. Rtest
Webpages don't have tailored products	Engage IT/web design developer
Advanced products on all timescales	Training on visualisation & combining climate with other environmental data



User Interface Platform (interact and get feedback from users, identify user requirements, assist in interpretation, assist with info for risk management and transfer)

GFCS Pillar	NMHS Category	Senegal	Cote d'Ivoir	Niger	Mali	Rwanda	Ethiopia	Malawi
4 User Interface platform	Requirements 1							
	Requirements 2							
	Requirements 3							

Common Weaknesses	Suggested Interventions
Documenting user feedback	Setup online and mobile-based procedures
Formalised product redesign procedures	Introduce SOPs for product redesign
MoU/partners and develop tailored products	Formalise collaborations with user-orientated organisations
Users have access to website/API interface	Provide website and APIs to collected data



Capacity development (trained technicians, forecasters, and management; NHMS legislation and policy participation; access to internet, hardware and software)

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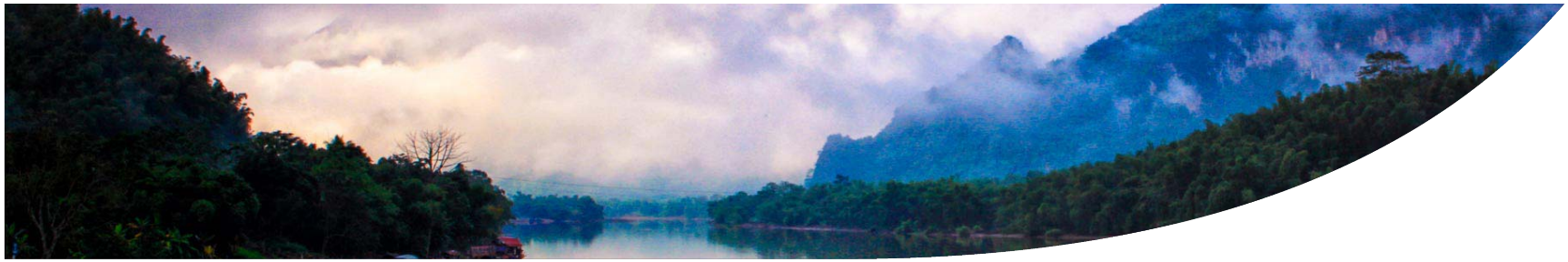
5 Capacity development	Requirements 1							
	Requirements 2							
	Requirements 3							

Common Weaknesses	Suggested Interventions
Participation in national policies	Engage young staff in DRR, NAP and NAMA platforms
Staff training protocols	Develop training framework (types of training, refresher courses etc)
Train mid-level technicians	Courses at Universities/regional training centres
Diversify staff specialties	Recruit from a wider range of backgrounds



Detailed interventions for each country

based on essential and desirable capacities

Pillar	Existing category	Recommended Capacities				
		Essential Capacities (would fulfil the requirements of their current category)	Suggested intervention		Desirable Capacities (would fulfil the requirements for the next category up)	Suggested intervention
4: User interface Platform	1	Formal training in engaging with users	Training or recruitment of an extension officer or climate service specialist Provide a facilitated environment in which forecasters and representatives from the user communities are able to discuss forecast needs and products		Document user feedbacks and use those feedback to improve products	Document in writing user feedback to assess the usefulness and effectiveness of the information and services provided. Establish procedures to incorporate user feedback into the redesign of climate information products and services and the development of new products and services.
		Documentation (in writing) of user feedback	Create an internal Frequently Asked Questions repository of user questions and comments		Development of website, API and mobile network tools	Recruit staff with requisite skill set to facilitate good internet presence of the forecast products of the NMHS

Consistent interventions relevant to most NMHSs.

Expansion of weather monitoring networks.

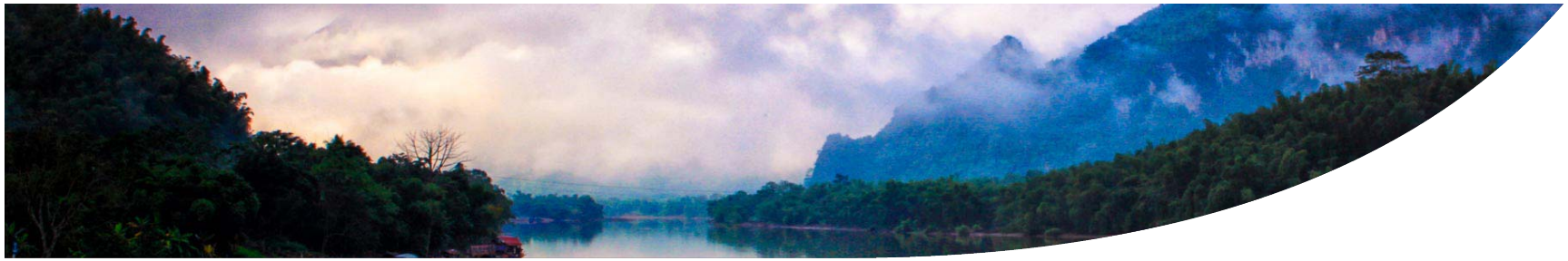
- (a) Expansion of observation networks, QA/QC, sustainable O&M mechanisms; (b) standard and accessible databases of observations;
- Equipment choice based on required use e.g. for early warning accuracy less important than timeliness. Implication on costs and O&M;

Medium range forecasts

- Improved bandwidth for downloading boundary conditions;
- Using Model Output Statistics (MOS) with existing station data.

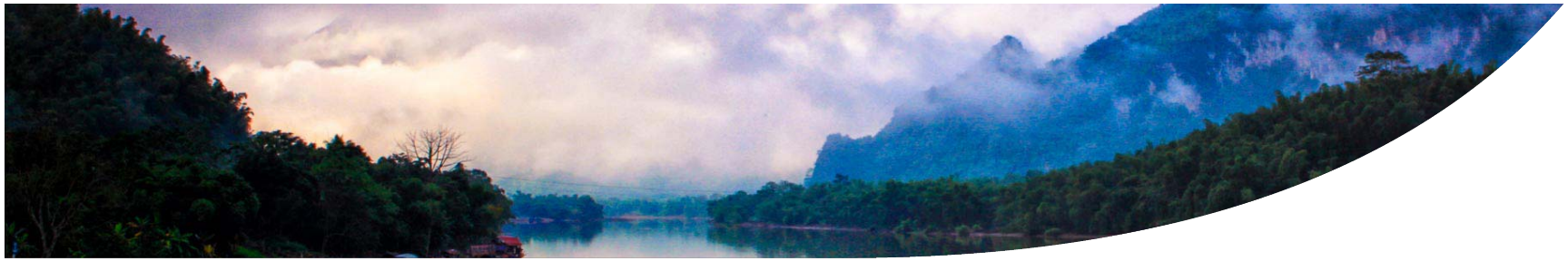
Interacting with users

- Dedicated staff to work with users and develop tailored products;
- Establish research capacity to revise/redesign/test products;
- Use of web/mobile communications for dissemination and feedback.



Limitations of the analysis

- Weighting of each metric – reflects prioritisation of particular capacities;
- Definition of thresholds for ‘fully met’ and ‘partially met’ criteria;
- More emphasis on quantitative criteria which are easier to measure/value;
- Difficult to measure institutional capacity and sustainability – ability to deal with staff turnover and development



Key messages

- The scores/numbers are not so important, rather whether we are capturing the right measures (identify right interventions, monitoring progress);

- Several intervention options exist to address each weakness. Implies a flexible approach based on country context (staff resources/skills, funds);

Thank you !