

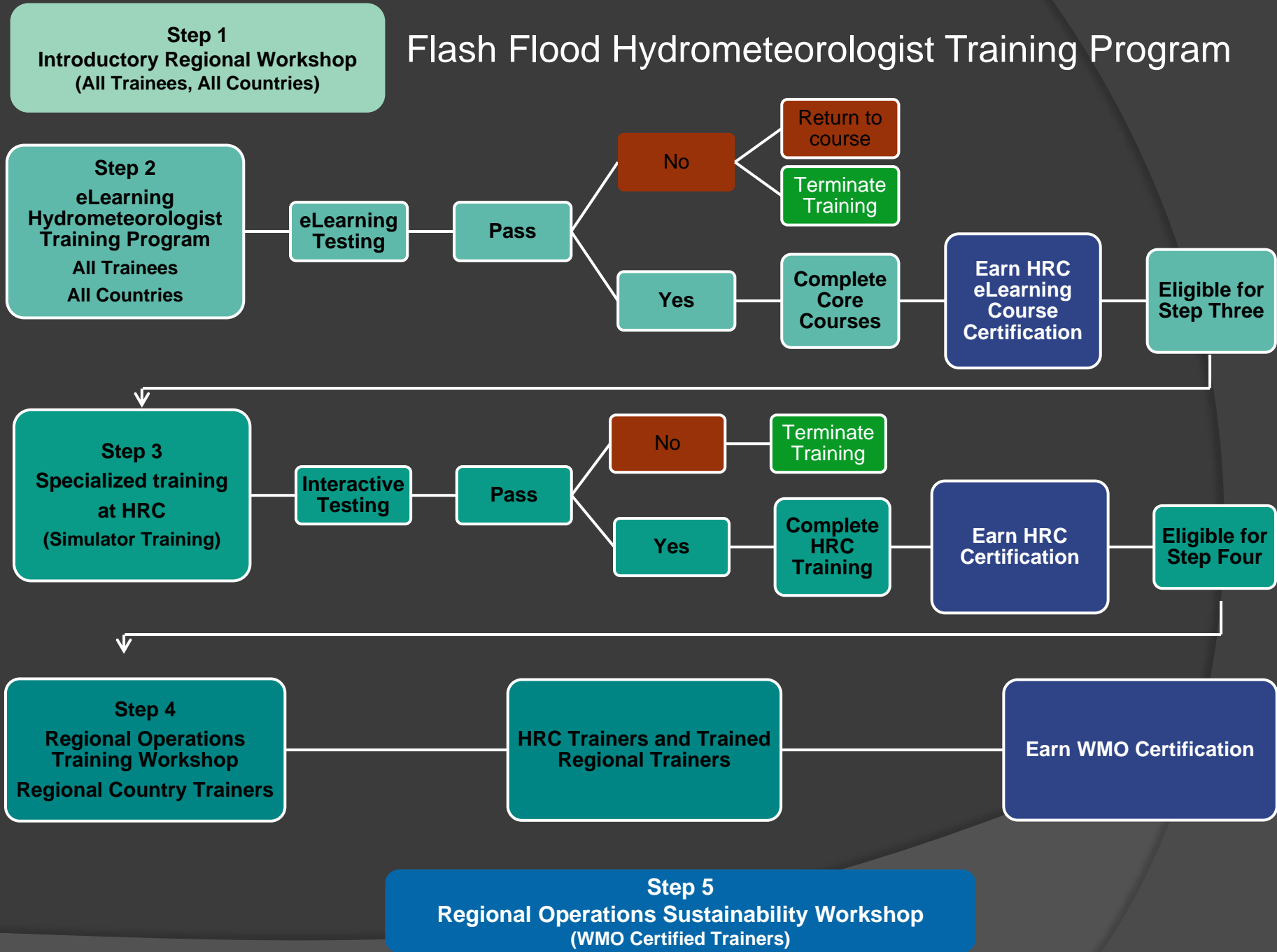
FLASH FLOOD GUIDANCE SYSTEM HYDROMETEOROLOGIST TRAINING PROGRAM

Dr. Theresa Modrick, Research Engineer
Dr. Rochelle Graham, Research Meteorologist
& Education Director
Hydrologic Research Center

Central Asia Regional Flash Flood Guidance System
Steering Committee Meeting 2
6 October 2016



Flash Flood Hydrometeorologist Training Program



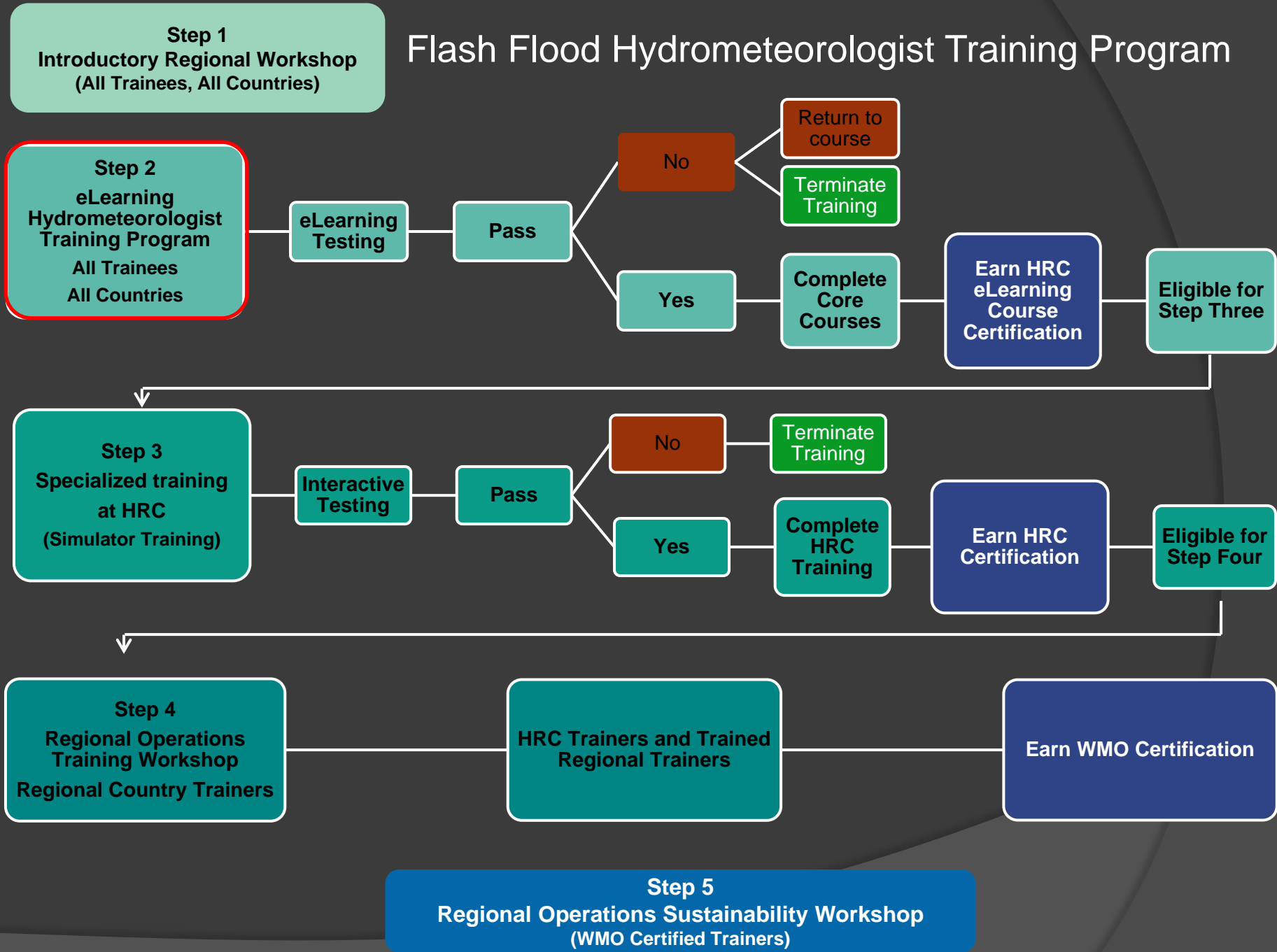
Flash Flood Hydrometeorologist Training Program

Step one Introductory Regional In-Country Workshops Done during implementation

- ❑ Re-introduction to the Regional Flash Flood Guidance System
- ❑ Introduction to models used and products produced in the FFG system.
- ❑ Discussion of data requirements still needed and verification of data



Flash Flood Hydrometeorologist Training Program



Flash Flood Hydrometeorologist Training Program

Step two eLearning Hydrometeorologist Training Program

eLearning program to support system operations, product interpretation, system validation, including the use, management, and interpretation of output from the system, and the development of protocols to alert response agencies and the public of an impending or existing threat;

Five courses:

- ❑ Elements of Meteorology
- ❑ Elements of Hydrology
- ❑ Geographical Information Systems (GIS)
- ❑ Remote Sensing
- ❑ Flash Flood Guidance System products

Flash Flood Hydrometeorologist Training (FFHT) Program

HYDROLOGIC RESEARCH CENTER

A NON-PROFIT RESEARCH AND TECHNOLOGY TRANSFER CORPORATION, ESTABLISHED IN 1993

USERNAME

PASSWORD

Login

[Forgotten your username
or password?](#)

REGISTER
NEW USER

VISIT THE
HRC WEBSITE

Eight courses

Elements of Meteorology,
Elements of Hydrology,
Hydrometeorological Statistics,
Fluvial geomorphology,
GIS basics,
Flash Flood Guidance Model Products,
Remote sensing and
Early warning systems.



VIEW COURSES

Filter Courses

All Course

MEKONG RIVER COMMISSION MODULE

Forum

+ Add

Edit

Delete

Courses

Course Material

Examination

Actions

Mekong River Commission Flash Flood Guidance Products Module

Add | View

Add

Edit Add Delete

ELEMENTS OF METEOROLOGY

Forum

+ Add

Edit

Delete

Courses

Course Material

Examination

Actions

Overview

Add | View

Add

Edit Add Delete

FLASH FLOOD GUIDANCE PRODUCTS

Forum

+ Add

Edit

Delete

Courses

Course Material

Examination

Actions

FORUM TEST

Forum

+ Add

Edit

Delete

Courses

Course Material

Examination

Actions

ELEMENTS OF HYDROLOGY

Forum

+ Add

Edit

Delete

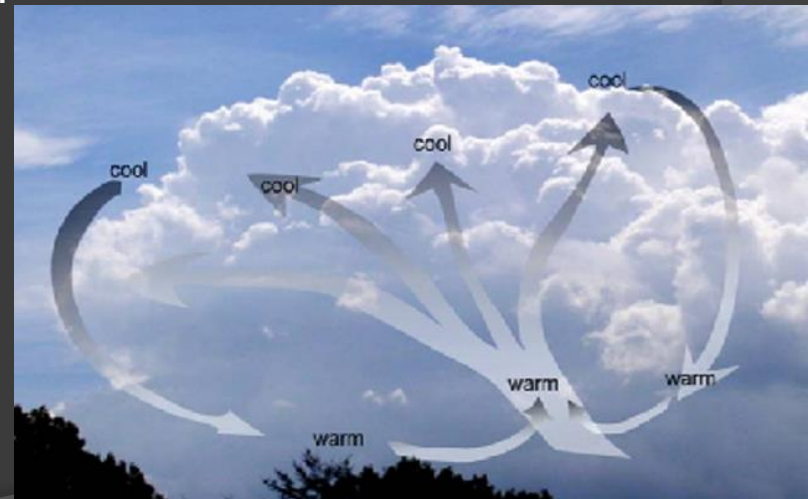
Flash Flood Hydrometeorologist Training Program

Step two eLearning Hydrometeorologist Training Program

Elements of Meteorology

Flash floods are events that are the result of heavy or excessive amounts of rainfall within a short period of time, usually less than 6 hours, causing water to rise and fall quite rapidly.

1. Factors necessary to produce heavy rainfall
2. Elements necessary for deep moist convection.
3. Characteristics of flash flood producing storms.
4. Examples of flash flood producing storms.
5. Meteorological processes that contribute to flash floods.



Flash Flood Hydrometeorologist Training Program

Step two eLearning Hydrometeorologist Training Program

Elements of Hydrology

Fundamental components of the hydrologic cycle, rainfall-runoff processes, evaporation, infiltration and groundwater flow, water budgets, introduction to surface and sub-surface hydrology, and flash flood modelling using simulation and spatial analysis tools.

1. Water cycle
2. Surface hydrology
3. Sub-surface hydrology
4. Flash floods – unique properties



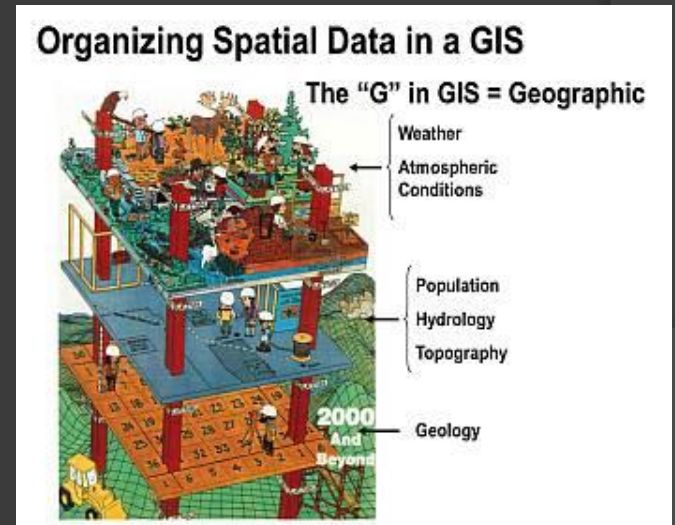
Flash Flood Hydrometeorologist Training Program

Step two eLearning Hydrometeorologist Training Program

Geographical Information Systems (GIS)

An introduction to GIS with a focus on the science applications of GIS systems, how data is generated, and how to use different software tools to map and analyze GIS data.

1. Description of GIS – introduction of concepts and application using Arcview/QGIS
2. Applied use of GIS – as related to flash flood
3. Manipulation of data for new or modifications of flash flood forecasting using GIS
4. Types of analysis available using GIS
5. Practical exercise



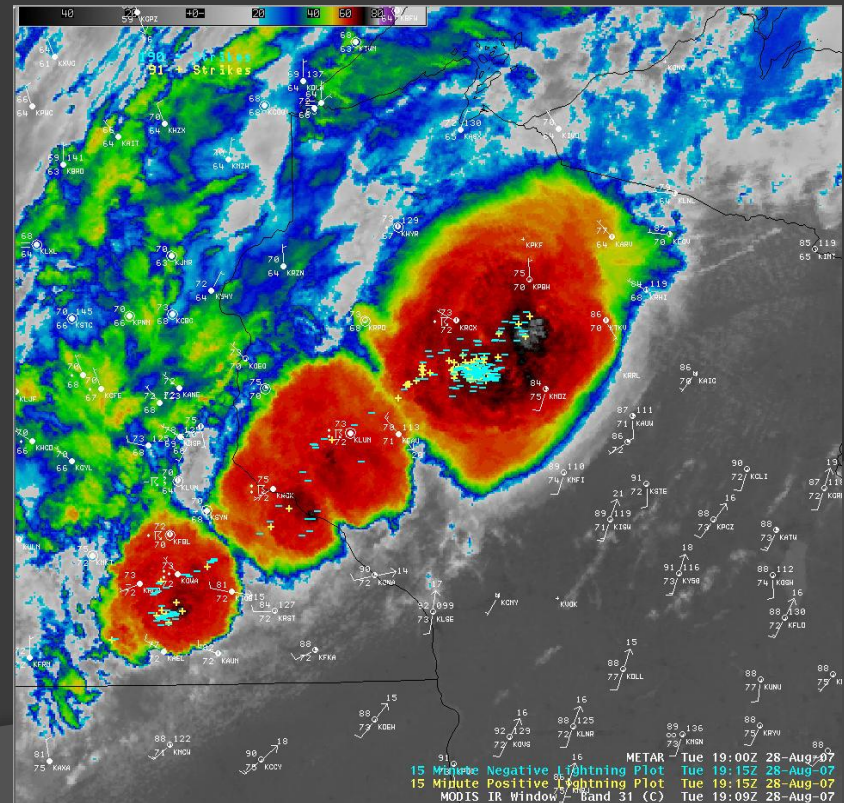
Flash Flood Hydrometeorologist Training Program

Step two eLearning Hydrometeorologist Training Program

Remote Sensing

A introduction/overview of remote sensing methodology for data collection, analysis and the parameterization of environmental models relating to processes and models of the land surface.

1. Satellite representation of rainfall
2. Radar representation of rainfall
3. Land surface remote sensing



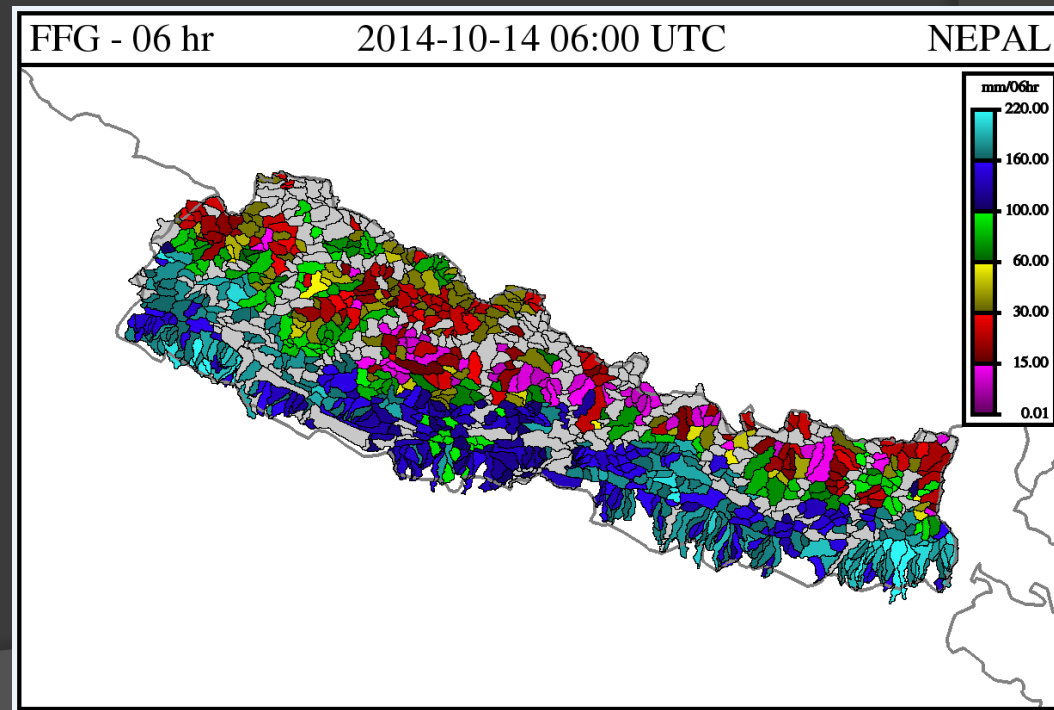
Flash Flood Hydrometeorologist Training Program

Step two eLearning Hydrometeorologist Training Program

Flash Flood Guidance System products

An overview of the application of flash flood guidance model products.

1. Description of flash flood guidance system - introduction of concepts and application
2. Types of analysis available using flash flood guidance model
3. Practical exercise using flash flood guidance model



Flash Flood Hydrometeorologist Training (FFHT) Program

HYDROLOGIC RESEARCH CENTER

A NON-PROFIT RESEARCH AND TECHNOLOGY TRANSFER CORPORATION, ESTABLISHED IN 1993

USERNAME

PASSWORD

Login

[Forgotten your username
or password?](#)

REGISTER
NEW USER

VISIT THE
HRC WEBSITE

Eight courses

Elements of Meteorology,
Elements of Hydrology,
Hydrometrological Statistics,
Fluvial geomorphology,
GIS basics,
Flash Flood Guidance Model Products,
Remote sensing and
Early warning systems.



VIEW COURSES

Filter Courses

MEKONG RIVER COMMISSION MODULE

Forum

+ Add

Edit

Delete

Courses	Course Material	Examination	Actions
Mekong River Commission Flash Flood Guidance Products Module	Add View	Add	

ELEMENTS OF METEOROLOGY

Forum

+ Add

Edit

Delete

Courses	Course Material	Examination	Actions
Overview	Add View	Add	

FLASH FLOOD GUIDANCE PRODUCTS

Forum

+ Add

Edit

Delete

Courses	Course Material	Examination	Actions
---------	-----------------	-------------	---------

FORUM TEST

Forum

+ Add

Edit

Delete

Courses	Course Material	Examination	Actions
---------	-----------------	-------------	---------

ELEMENTS OF HYDROLOGY

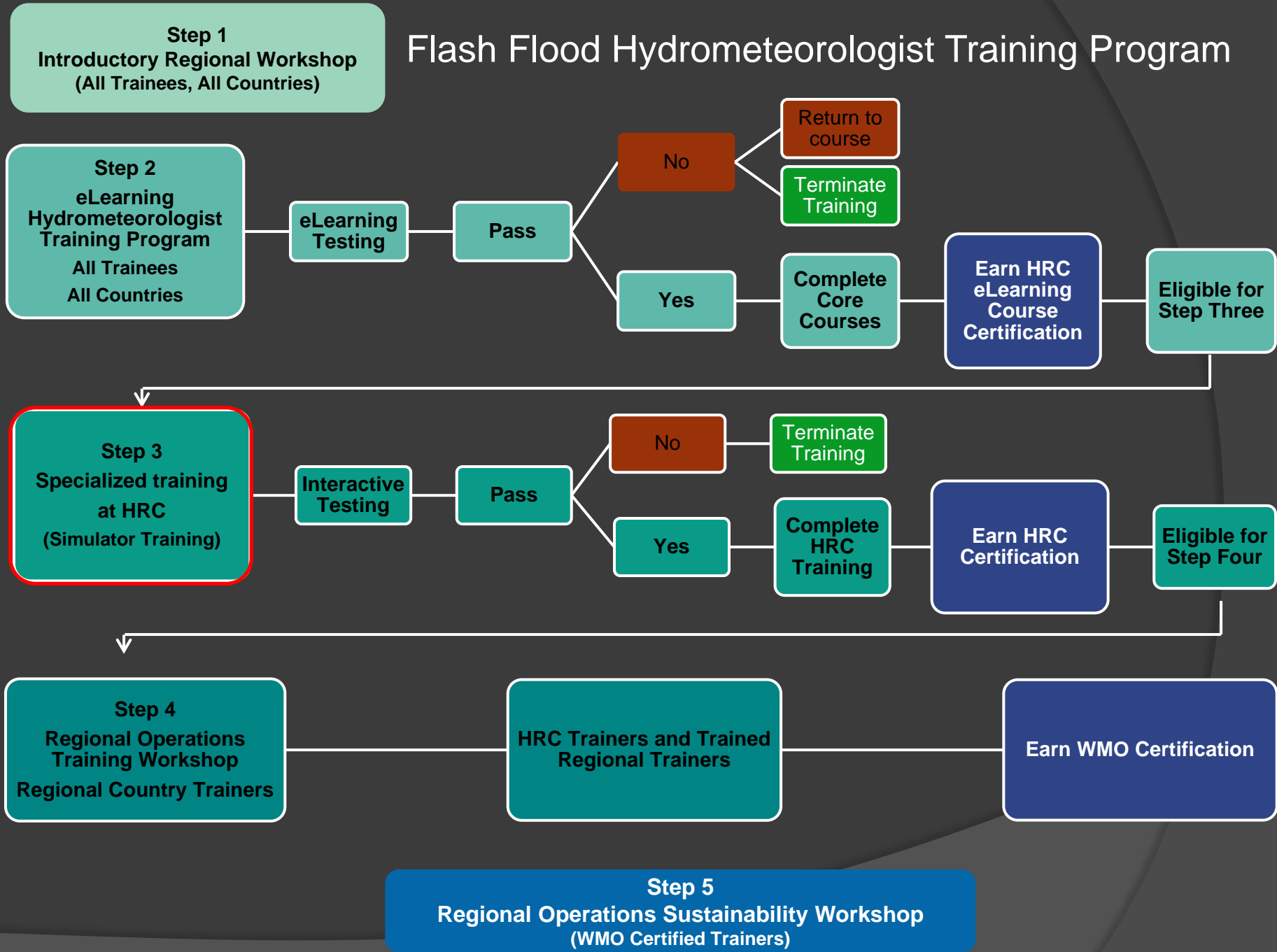
Forum

+ Add

Edit

Delete

Flash Flood Hydrometeorologist Training Program



Flash Flood Hydrometeorologist Training Program

Step three Specialized training at Hydrologic Research Center

Advanced Operations and Interactive Simulator Training at the Hydrologic Research Center focused on in-depth understand of System and operational application.



Interactive Simulator

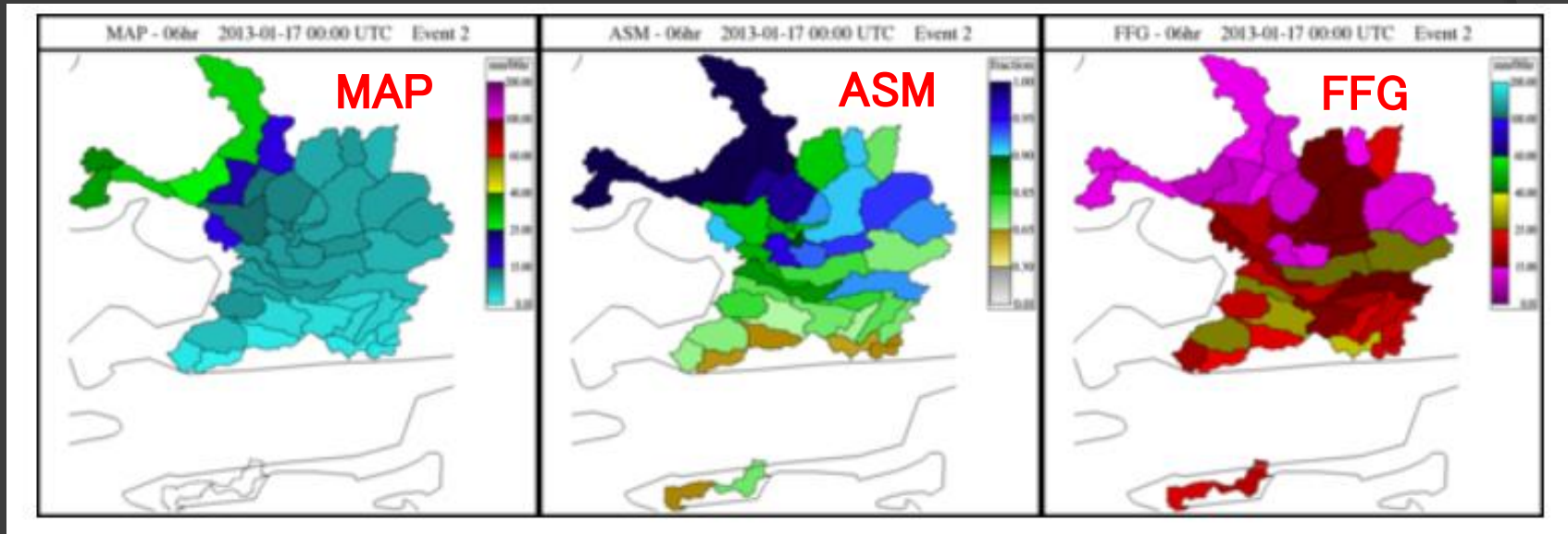
Objective: To permit forecaster to run 'What if' experiments with respect to inputs and parameters.



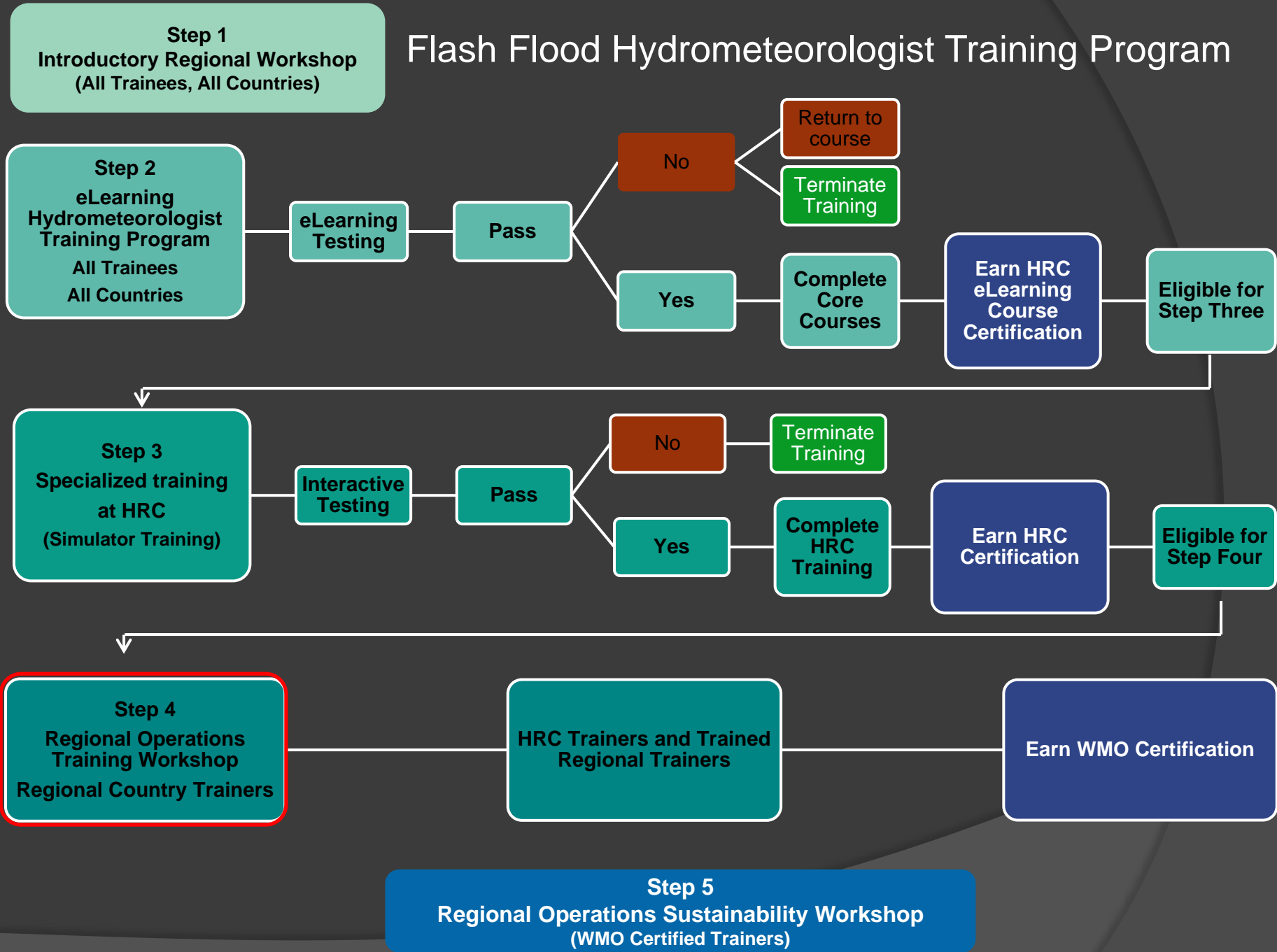
- Utilizes historical events drawn from existing operational systems
- Assumes synoptic analysis had been performed (synoptic descriptions of events provided).
- **Allows forecaster to make changes in input and/or parameters and gain understanding of the impacts of changes on FFG simulation and products, and *the impact on their decisions to issue flash flood warnings.***

Simulator Example

Simulator provides animations of time series of select FFG products over course of selected events.



Flash Flood Hydrometeorologist Training Program



Flash Flood Hydrometeorologist Training Program

Step four Regional Operations Training Workshop

HRC trainers in combination with Trained Regional - Trainers provide an in-country workshop at regional centers.

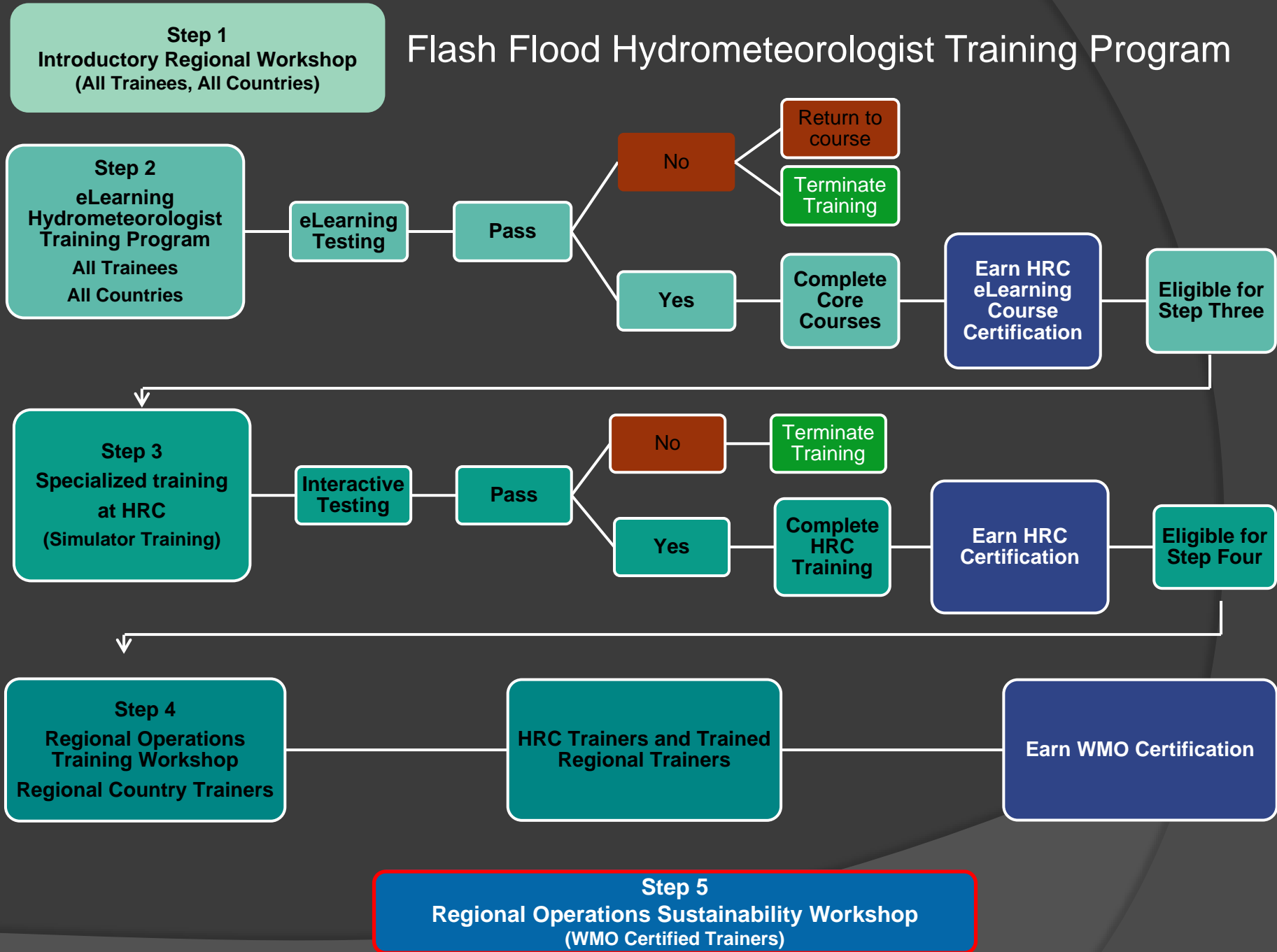
Three-day workshop covers:

(a) a brief discussion of the technical background and system development and,

(b) the operational use of the FFG System products through “hand-on” case studies; participants review and evaluate the FFG system products for selected events.



Flash Flood Hydrometeorologist Training Program



Flash Flood Hydrometeorologist Training Program

Step five Regional Operations Sustainability Workshop

Step 5 workshops are led by WMO certified trainers, and act as refresher training in operational use, data requirements (an overview), system verification and user validation.

Three-day workshop covers:

- (a) a brief discussion of the technical background and system development and,
- (b) the operational use of the FFG System products through “hand-on” case studies, where workshop participants reviewed and evaluated the FFG system products for selected events.

▶ Disaster Risk Reduction Education.....1

▶ Flash Flood Hydrometeorologist Training (FFHT) Program.....2

▶ Informed Children: For Better Disaster Preparedness3

▶ Philippines: Disaster risk reduction in school continues its journey 4 - 5

▶ From a System of Models to a Program: The Flash Flood Guidance Program6

ISSUE 3 | VOLUME 4 | 2014

Hydrologic Research Center
www.hrcwater.org

Flash Flood Guidance Gazette

Flash Flood Guidance (FFG) Gazette, a bi-annual newsletter bringing users of FFG products all the latest news – operational information, technical advances, case studies and a new e-learning environment for the flash flood community.

Special Issue: Disaster Risk Reduction

The International Day for Disaster Reduction (13th October, 2014) is a day to celebrate how people and communities are reducing their risk to disasters and raising awareness about the importance of Disaster Risk Reduction (DRR). For flash floods and floods community experience can provide the local knowledge and gender perspectives necessary for successful flash flood risk management strategies. Through DRR education it can also provide an understanding of the types, causes, and impacts of flash floods; flash flood hazards, and vulnerability to communities.

A community's DRR education can be the key to development and critical to broad-based economic growth, mitigation of the effects of fragility and conflict, and promoting country security. This is particularly true for areas heavily impacted by natural disasters such as droughts, floods, flash floods and earthquakes. As the sudden and emerging threats from natural disasters challenge individuals, families, communities and countries, educating affected populations becomes not only vital, but a requirement in the rebuilding process.

DRR education is not only a foundation of human development, in emergency situations; it provides physical and psychosocial protection, which can be both life-saving and life-sustaining. It is through education we can develop positive attitudes and responses, which are vital to confront crises, provide a channel for conveying survival messages, and promote personal development and preparedness for responsible citizenry.

Pakistan, Thailand, Haiti and the Philippines have been particularly hard hit in the past few years and the development of DRR programs that support literacy,

numeracy and life skills training point to aid in rebuilding communities. DRR education programs for systematic approach to identify mitigating the hazards associated hazards. If we focus on floods, the important characteristics of associated with these natural disasters (times) and with the potential impact (as little as two feet of flowing water) allows the learner to pose fundamental questions pertaining to the situation. This practical approach to understand their role and are given participate is one way to create awareness with individuals, families, and communities. The knowledge the learner gains and other natural disasters reduce the risk, empower the community approaches to mitigation and adaptation strategies.

The following articles provide case studies of programs that involve individuals and communities.

Students in the Philippines present their School Hazard Map to teachers and suggest some mitigating or preventative measures based on what they have learned.



Philippines: Disaster Risk Reduction through Red Cross Youth Movement (DRRMRCYM)



Youth are taught on how to conduct Hazard, Vulnerability, and Capacity Assessments for their schools, and communities.

Education is not only for the students: every year secondary teachers do their Enhancement Training on Basic Life Support and Survival Swimming.



Tricia Mae Plenos, Red Cross Youth (RCY) president speak on behalf of the youth from the Philippines. She shares her experiences being a Disaster Risk Reduction (DRR) advocate in local schools and emphasizes the role of children in disaster risk reduction.



Informed Children: For Better Disaster Preparedness

The new millennium has brought a combination of natural and human-caused disasters to Pakistan; that have resulted in massive loss of lives and property with women and children being the largest groups impacted. While support is provided by the government, NGOs and the public, it is the resiliency of those affected, which often assists in the return to a normal life. In flood and flash flood impacted areas multiple steps have been taken towards better preparedness for such sudden hazards. However, the primary focus has either been of improvement of infrastructure or empowerment of adults, primarily men. But it is preparation of the community including woman and children that I have found to best support improved disaster risk reduction (DRR) strategies. For the last two years, I, staff and volunteers of Social Research and Development Organization (SRDO), an NGO, have been regularly visiting the coastal areas of Thatta and Badin in the province of Sindh (vulnerable due to proximity with River Indus and the Arabian Sea). We

such as: the importance of making sure their homes are safe, identification of a safe place to stay in an emergency, a storage place for dry rations, and establishing quick and reliable alarm systems. This information permits them to not only inform themselves but also their families and communities. In the past couple of years we (SRDO) have seen many positive results, with families and communities starting to take precautionary measures with the first warning of a flash flood or flood. While this year the floods in Sindh province remain moderate, disaster preparedness needs to be continued for the safety of all vulnerable populations. For us at SRDO it has been the children that have acted as the catalyst and their talents need to be utilized to transform their communities and country into a better, safer place to live.

Contributor: Amm Mirza (ammiraza@hotmail.com) is a senior researcher, analyst and writer on social development issues, especially pertaining to women, youth and children.

to 16 years) to dness and tant role in DRR, d organized ing information sh and Development INGO, has been y of Sindh province. all-designed n for these needy



an. (C)