UNIVERSITÄT HEIDELBERG
ZUKUNFT SEIT 1386

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

SESSION 3: Enhancing links in the early warning chain

Flood early warning: linking regional, national and local levels

Experiences from the Philiippines

UN-SPIDER EWEM
Bonn, 25/26 June 2013

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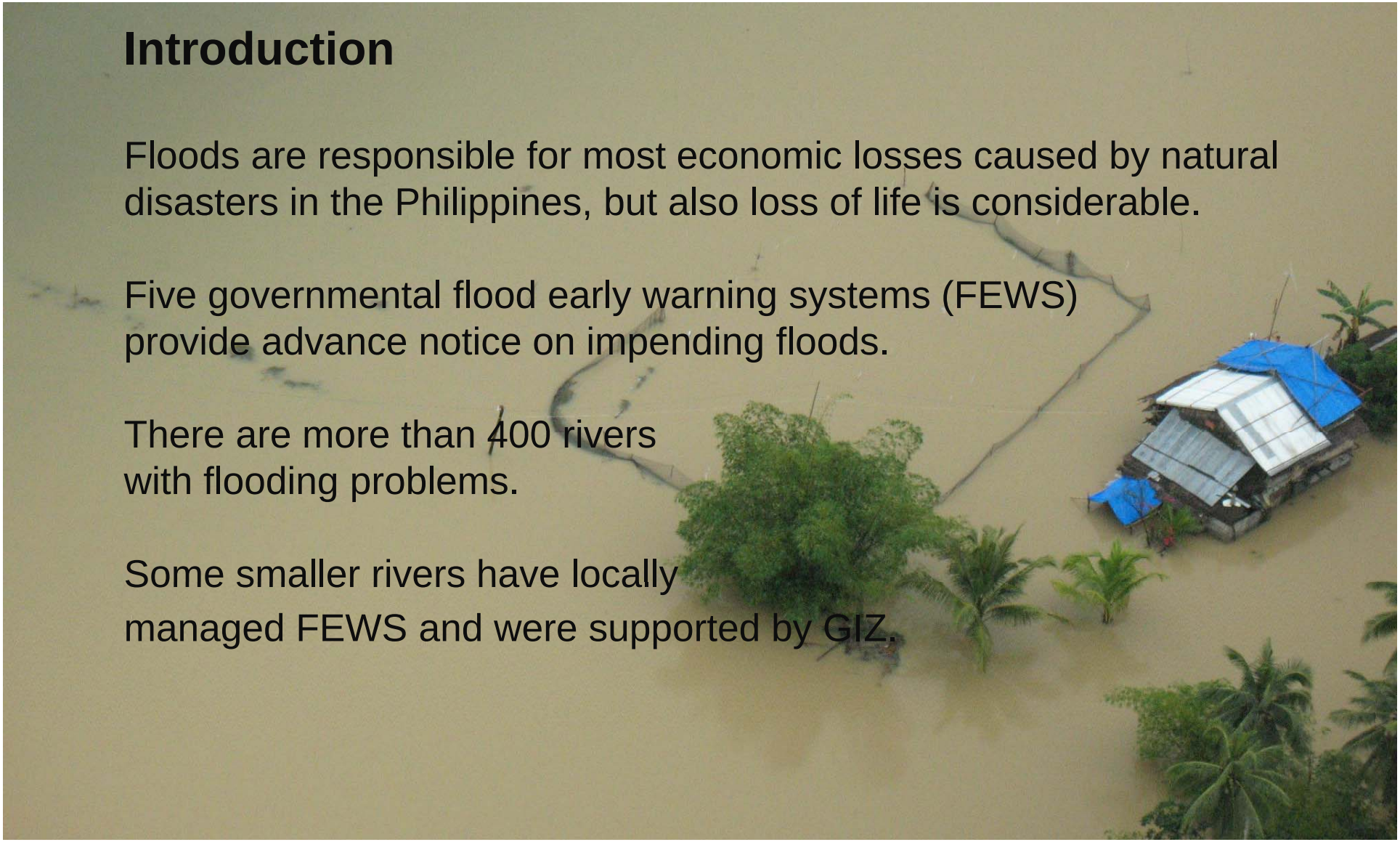
Introduction

Floods are responsible for most economic losses caused by natural disasters in the Philippines, but also loss of life is considerable.

Five governmental flood early warning systems (FEWS) provide advance notice on impending floods.

There are more than 400 rivers with flooding problems.

Some smaller rivers have locally managed FEWS and were supported by GIZ.

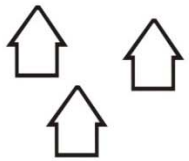


Key Elements of LFEWS

Risk Knowledge

Hazard

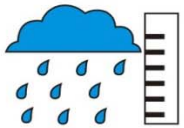
Elements at Risk



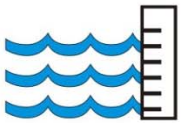
Vulnerability

Monitoring and Warning

Rainfall



River Level



Warning Decision

Dissemination and Communication

Radio

Telephone

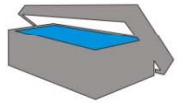
Household Warning

Response Capability

Evacuation Centre

Search & Rescue

Relief Goods



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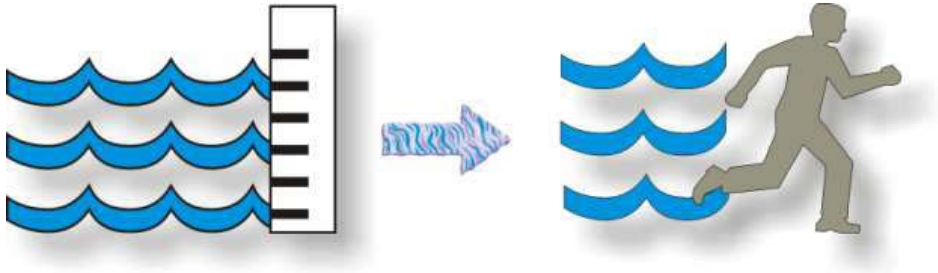
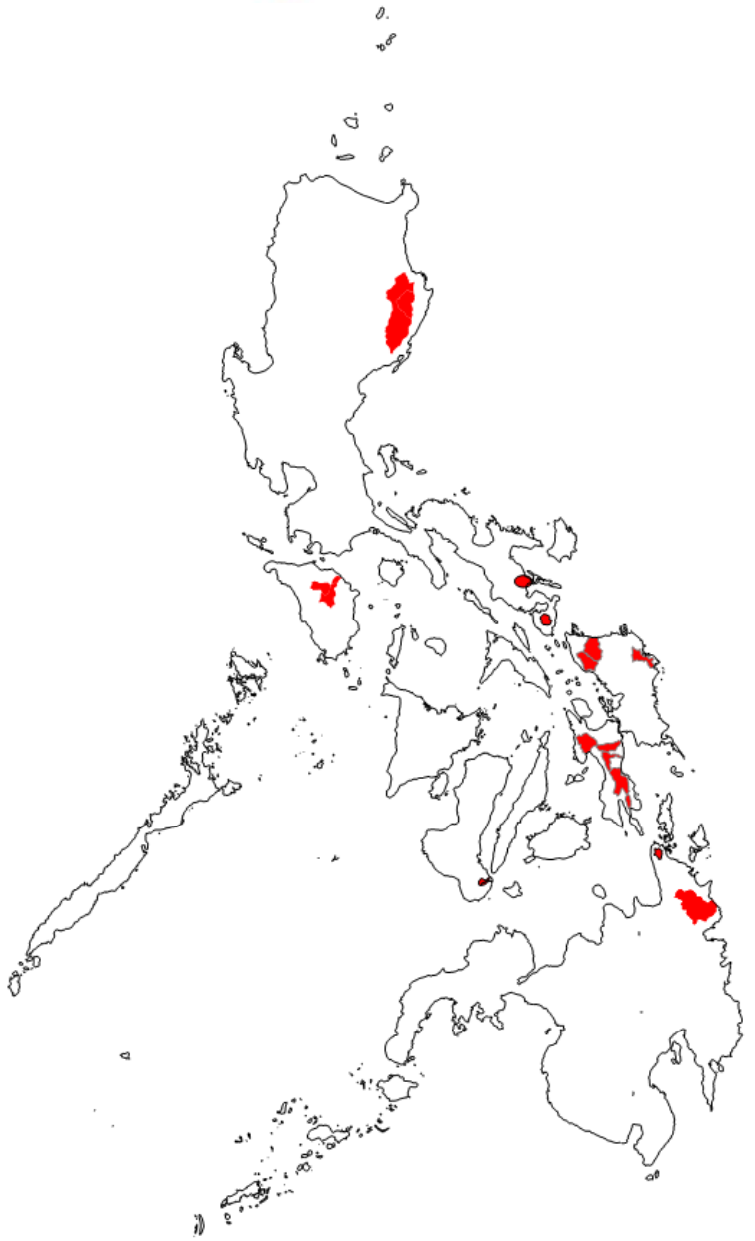
8 GIZ supported LFEWS are running
8 more will be completed in 2013

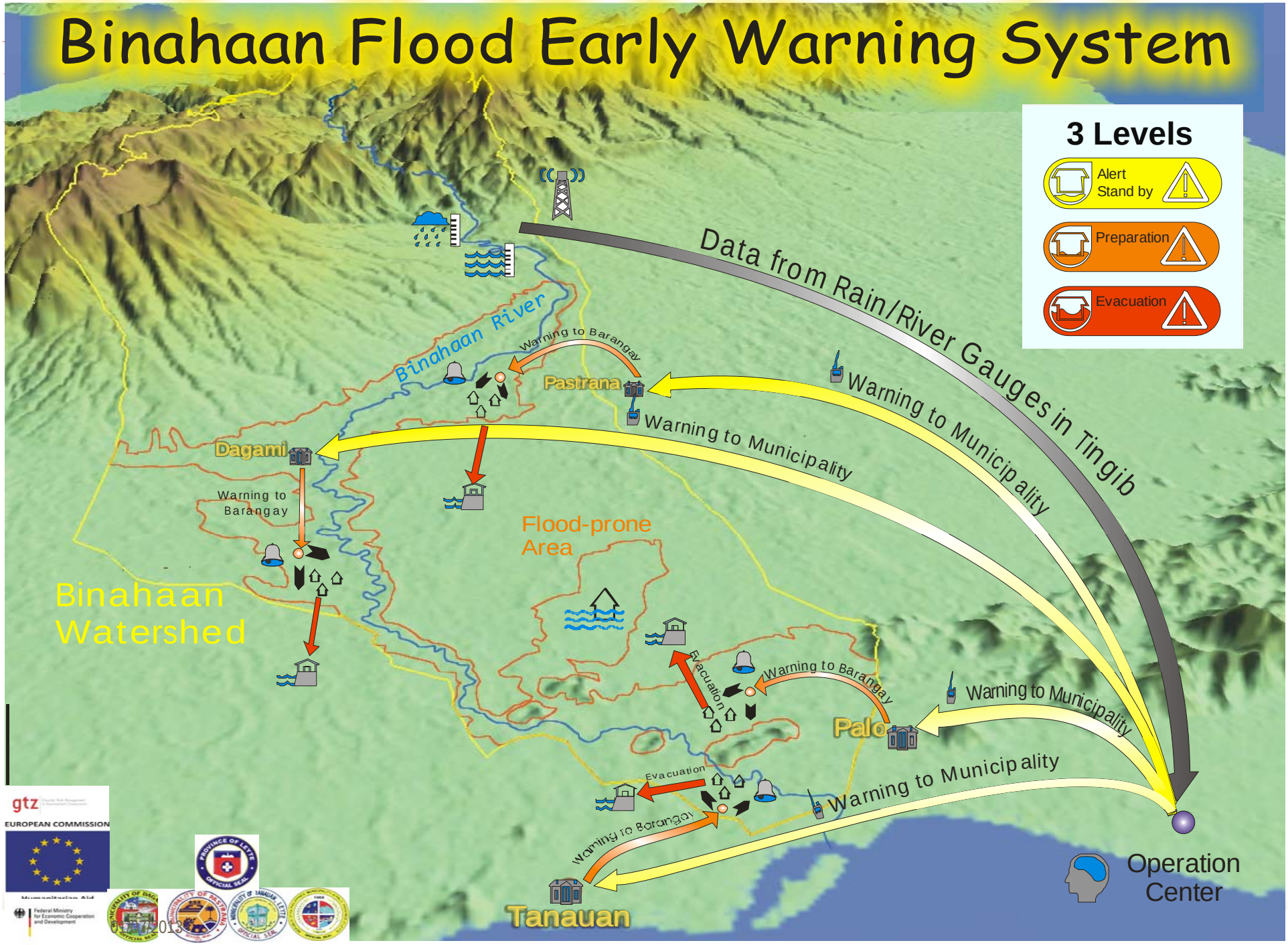
Low cost approach.

Operated and maintained by local non-hydrologists.

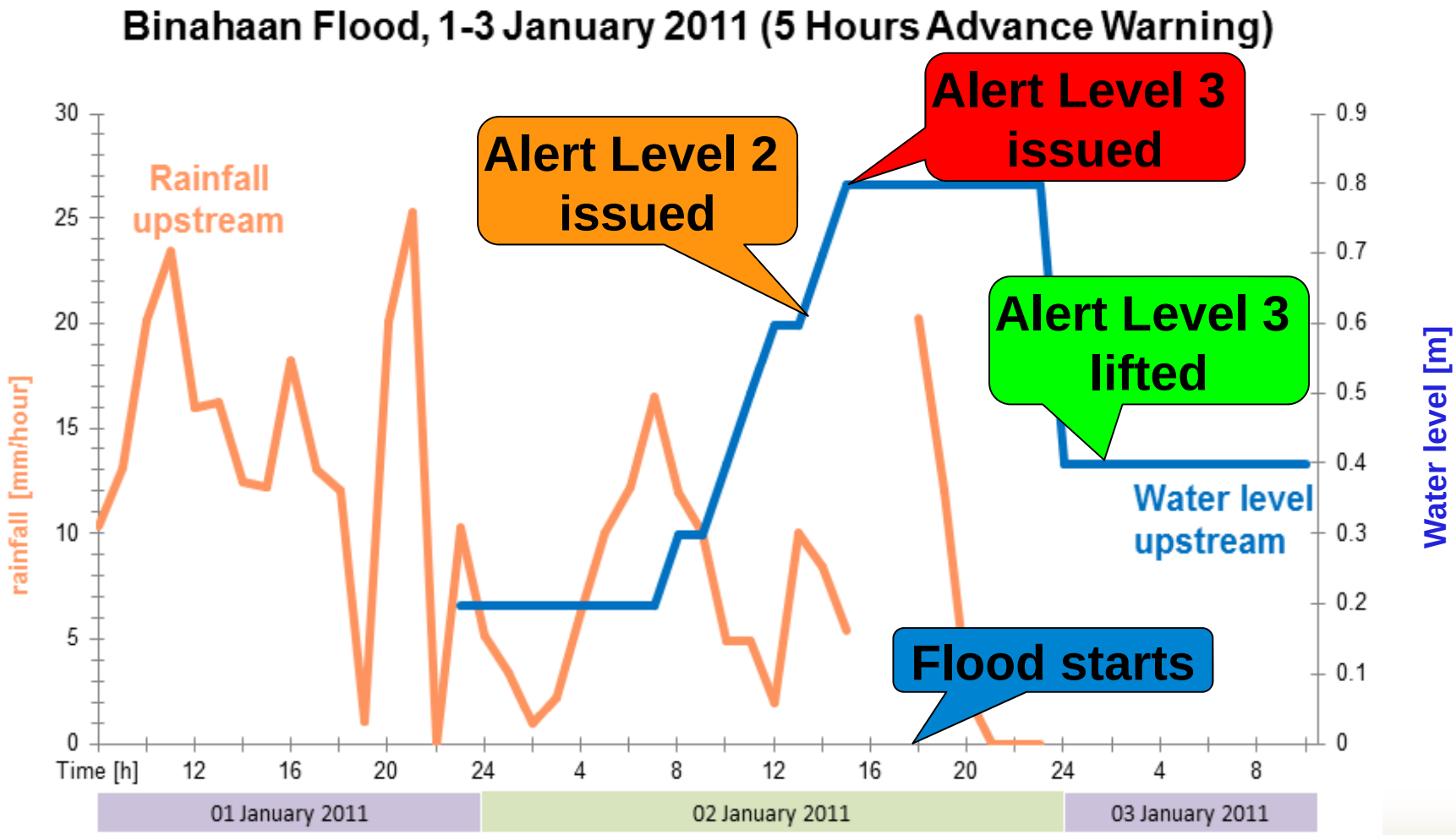
Local ownership and empowerment.





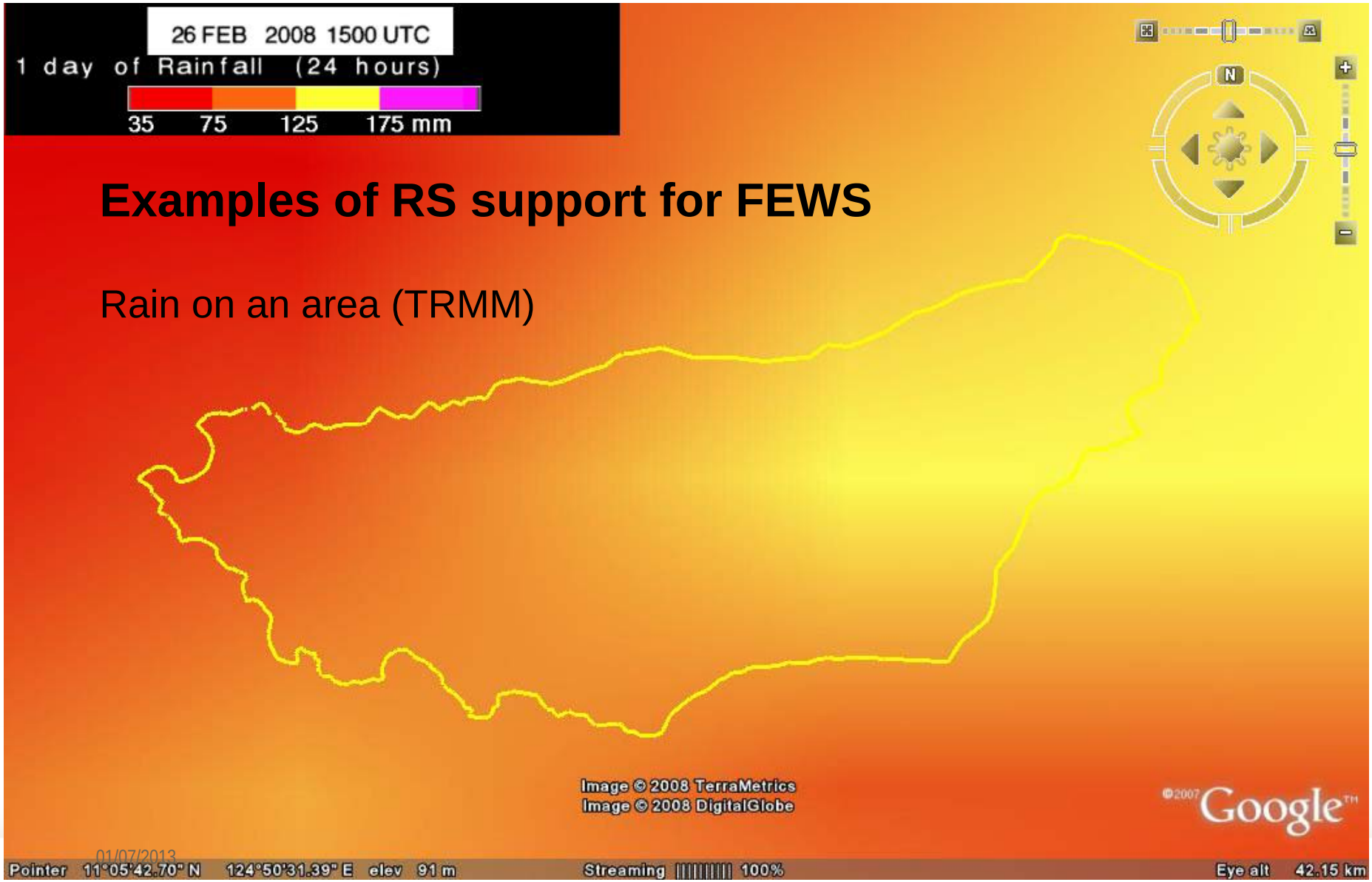

Binahaan Flood Early Warning System
3 Levels
Alert
Stand by
Preparation
Evacuation
Data from Rain/River Gauges in Tingib
Binahaan River
Warning to Barangay
Pastrana
Warning to Municipality
Warning to Municipality
Dagami
Warning to
Barangay
Flood-prone
Area
Binahaan
Watershed
Evacuation
Warning to Barangay
Warning to Municipality
Palo
Evacuation
Warning to Municipality
Warning to Barangay
Tanauan
Operation
Center
gtz
EUROPEAN COMMISSION

Actual Performance of FEWS During a Flood



Examples of RS support for FEWS

Rain on an area (TRMM)

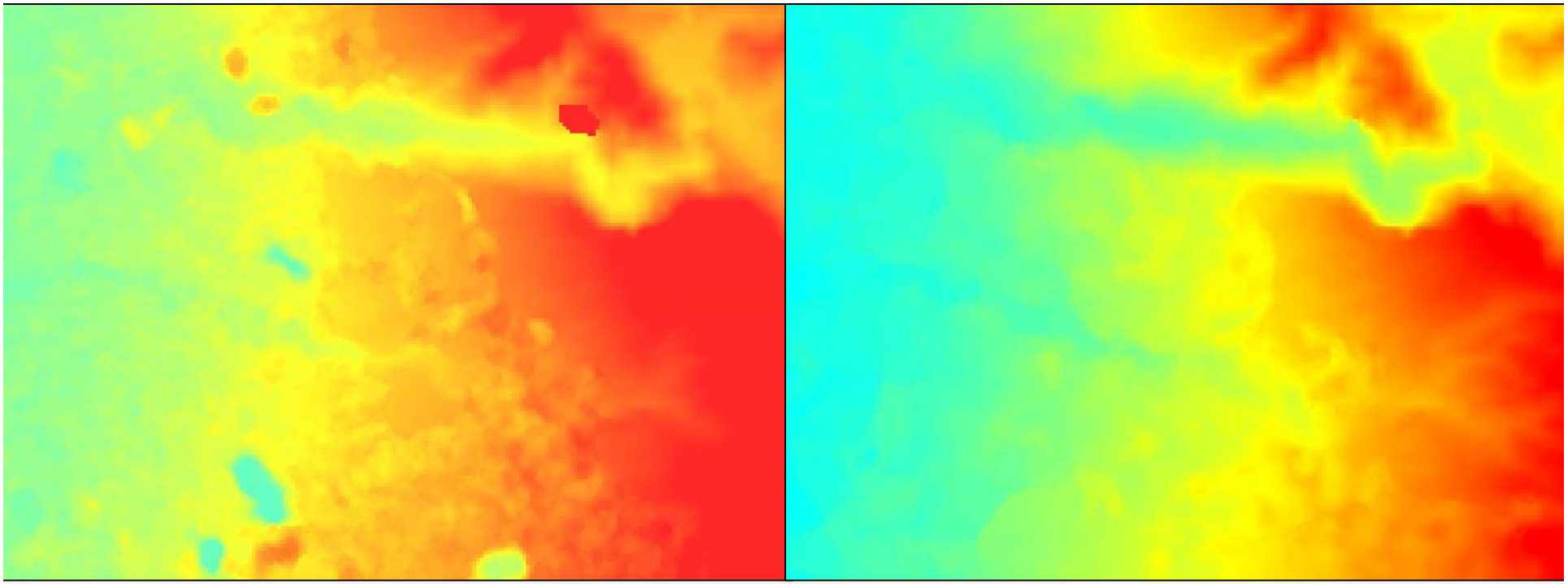


Examples of RS support for FEWS

ASTER DEM as basis for flood modelling

a) ASTER DEM, Version 2

b) ASTER DEM, with GIZ corrections



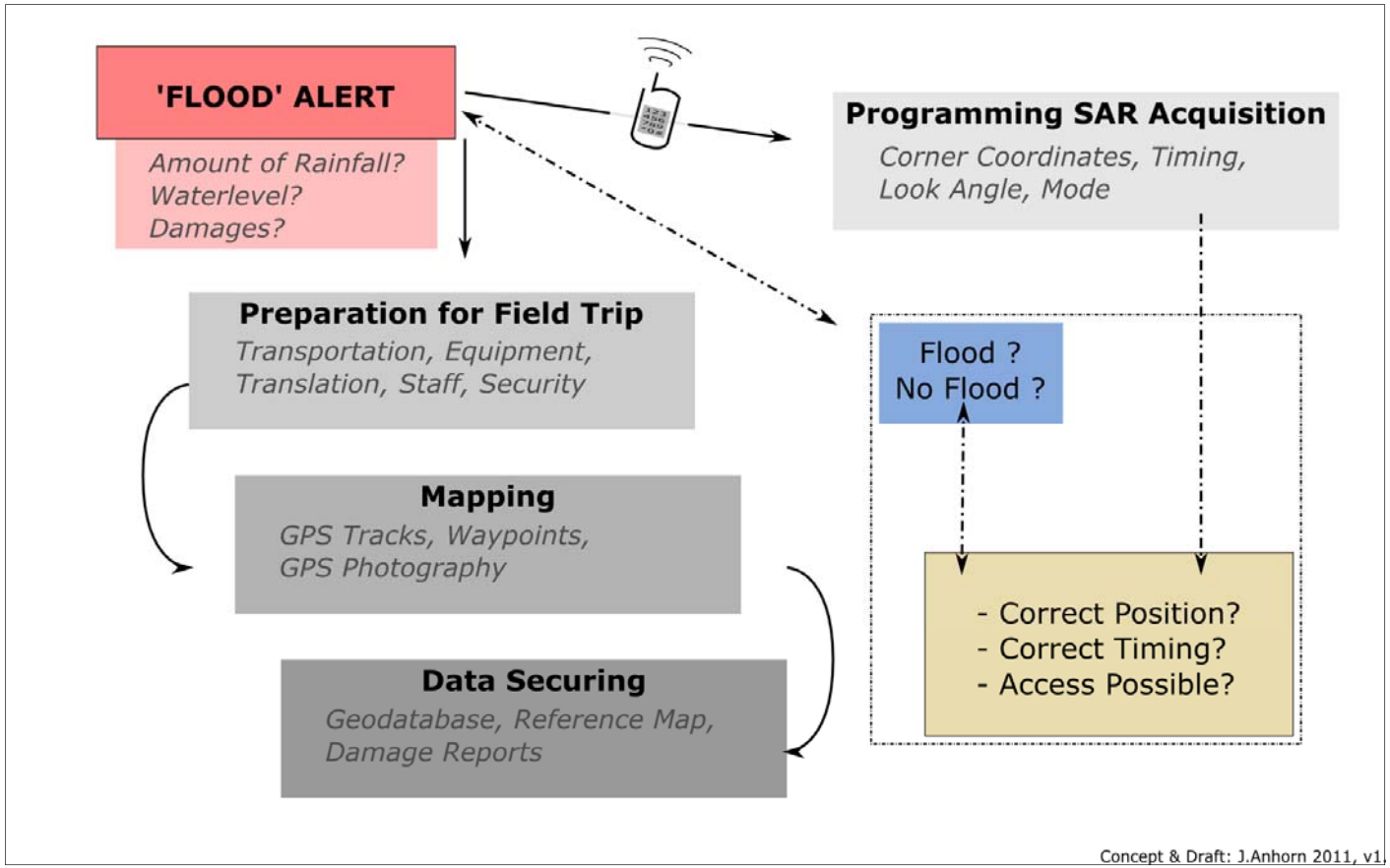
Flood Extent Mapping from HighRes TSX Data

→ Linking global, national, and local efforts

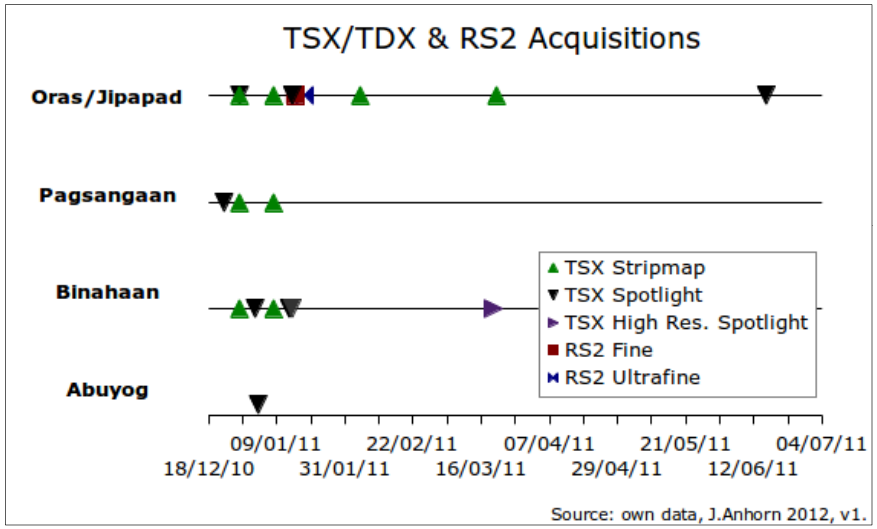
Project Background

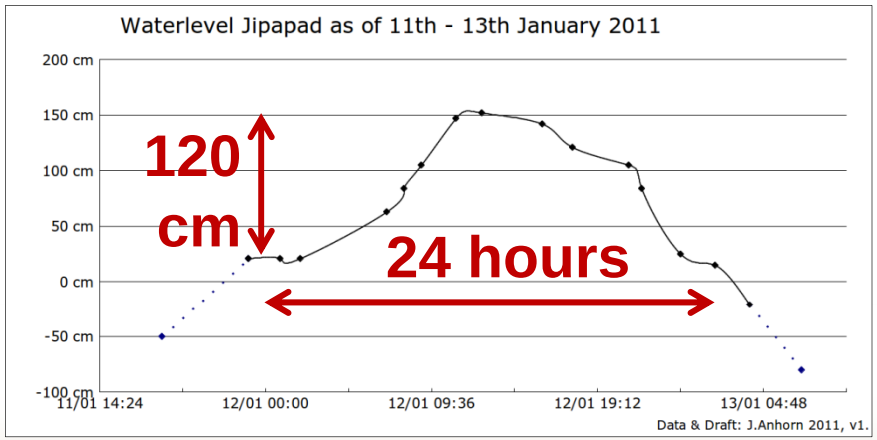
- Joint project of DLR and GIZ with different objectives:
  - How can existing flood extent mapping methods and algorithms be enhanced with on-the-ground field data?
  - How can high resolution Synthetic Aperture RADAR Data enhance the whole DRM ‘cycle’ and provide useful data for local FEWS?
- Aim: Identify the flood extent on a NRT basis with semi-automatic algorithms beneficial for local FEWS.

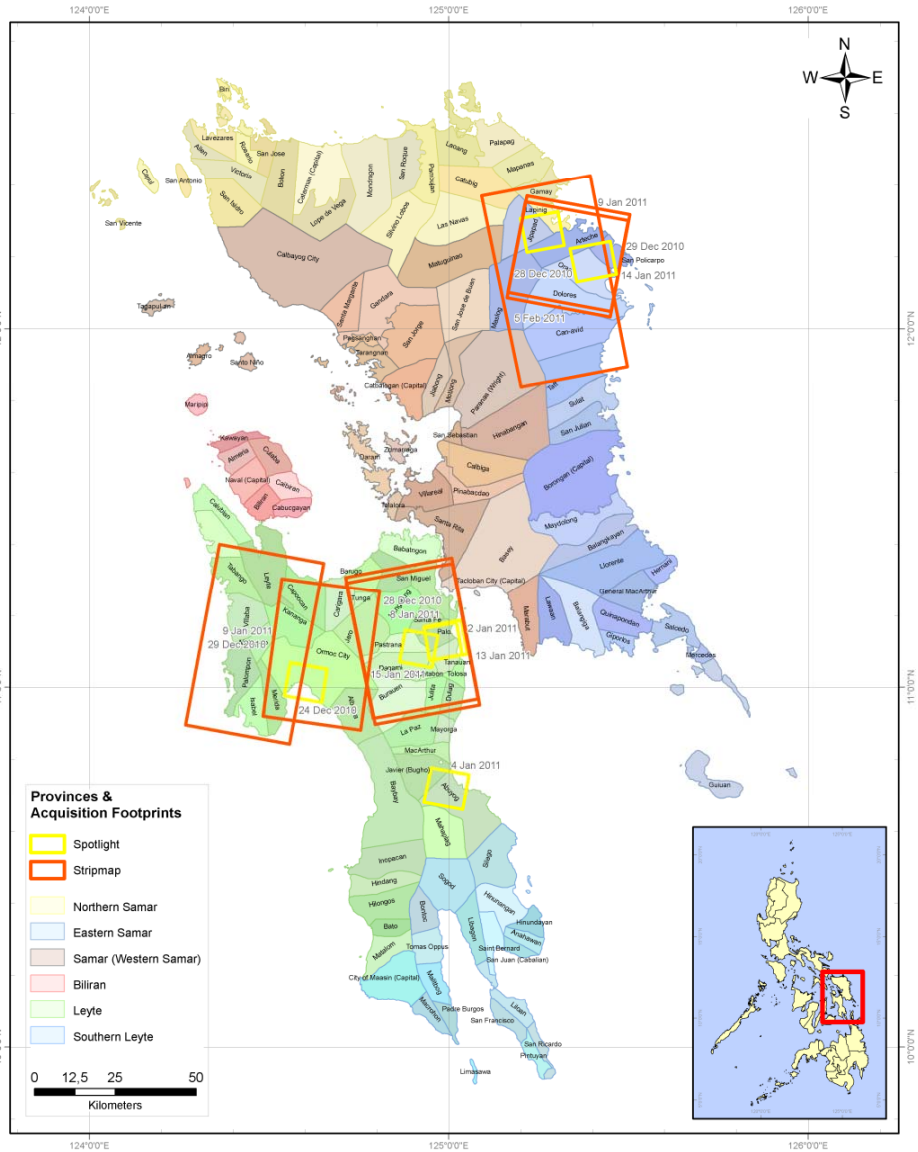
Flood Extent Mapping for Better *Risk Knowledge*



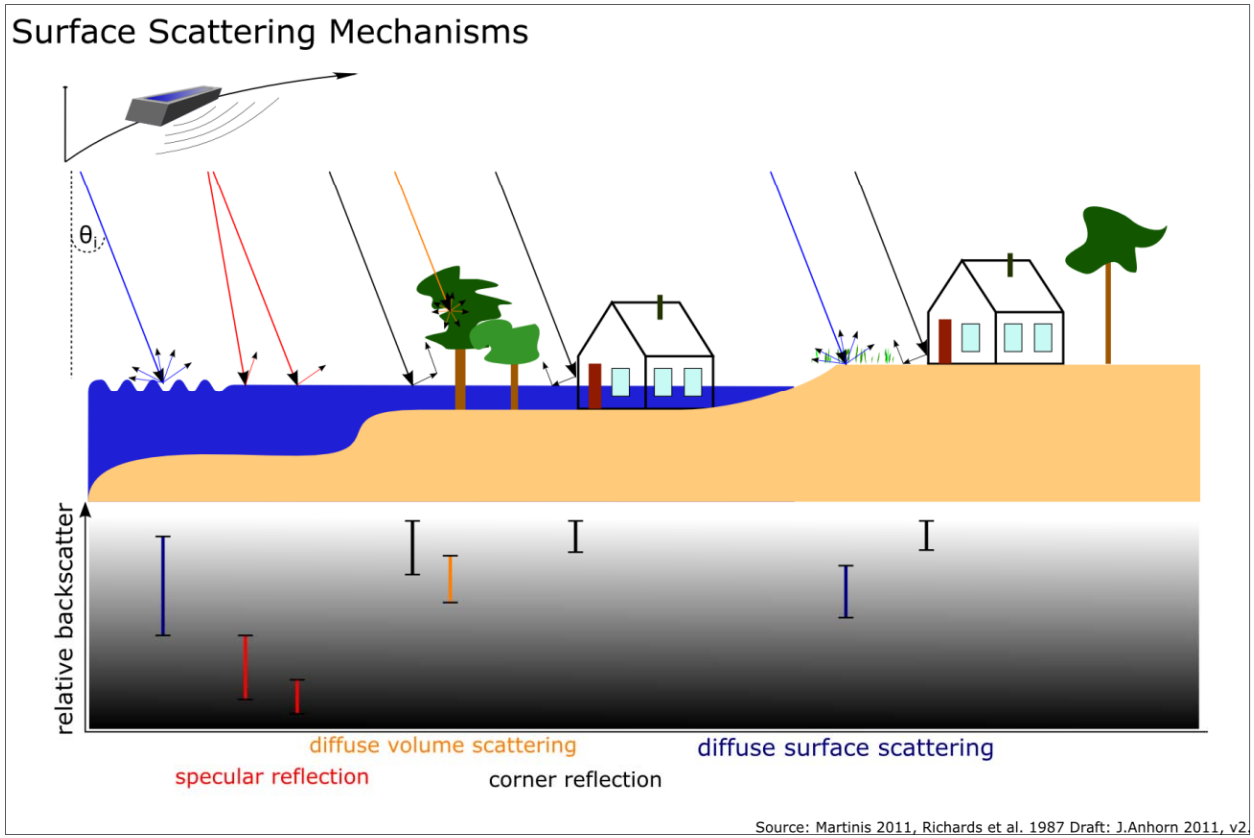
The Flood Events

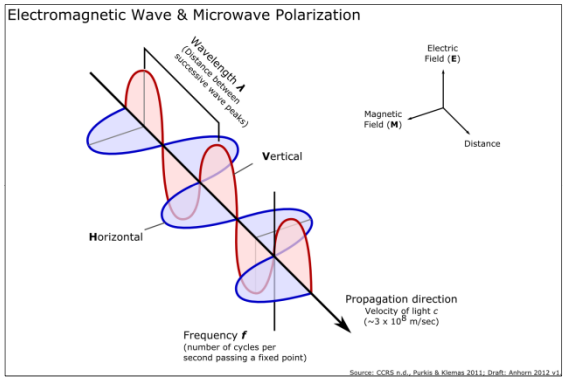


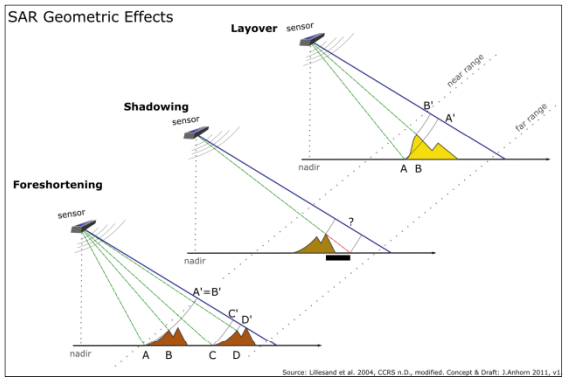




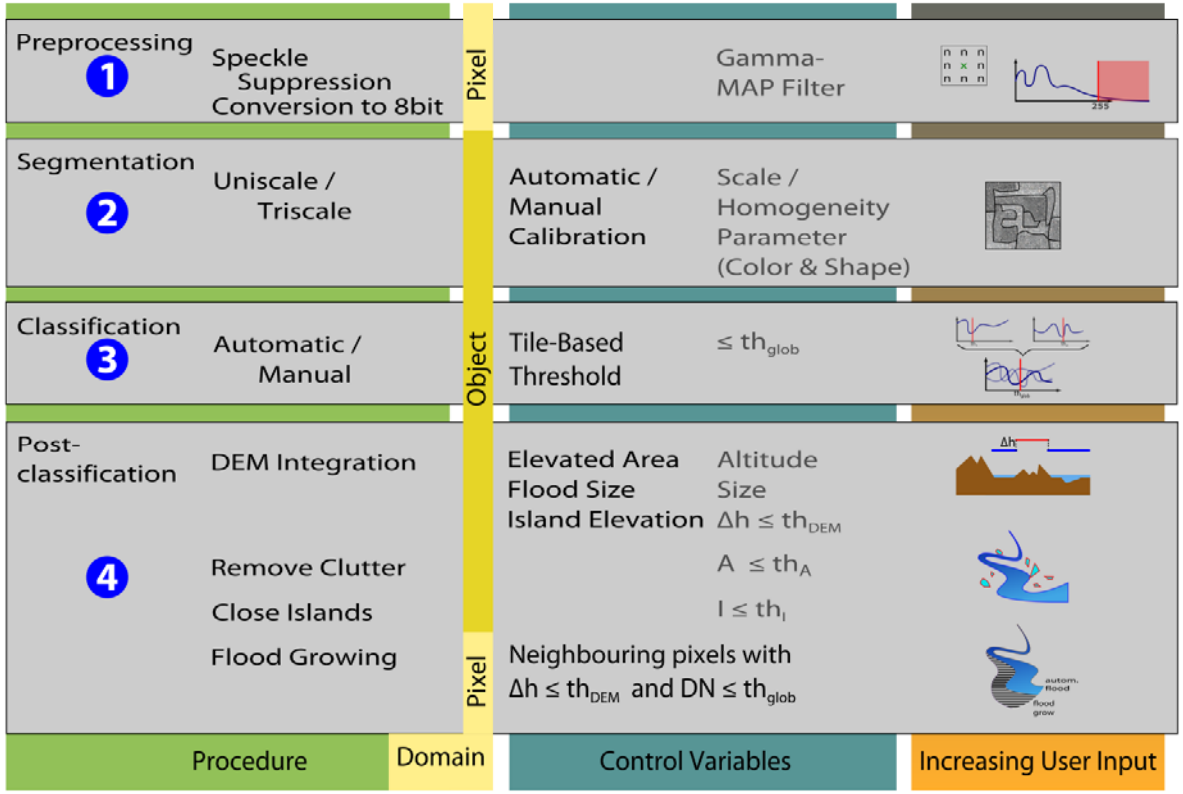
Algorithm Development





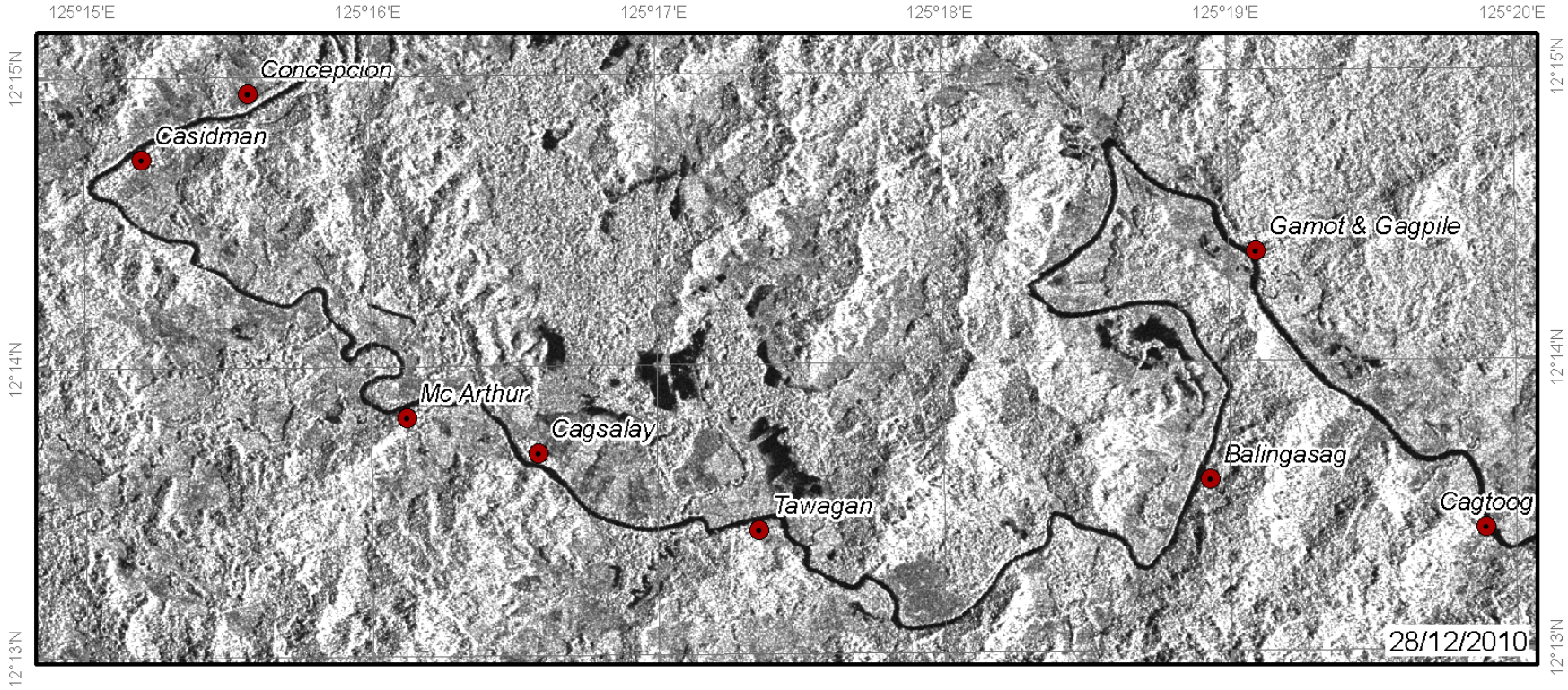


Algorithm Development

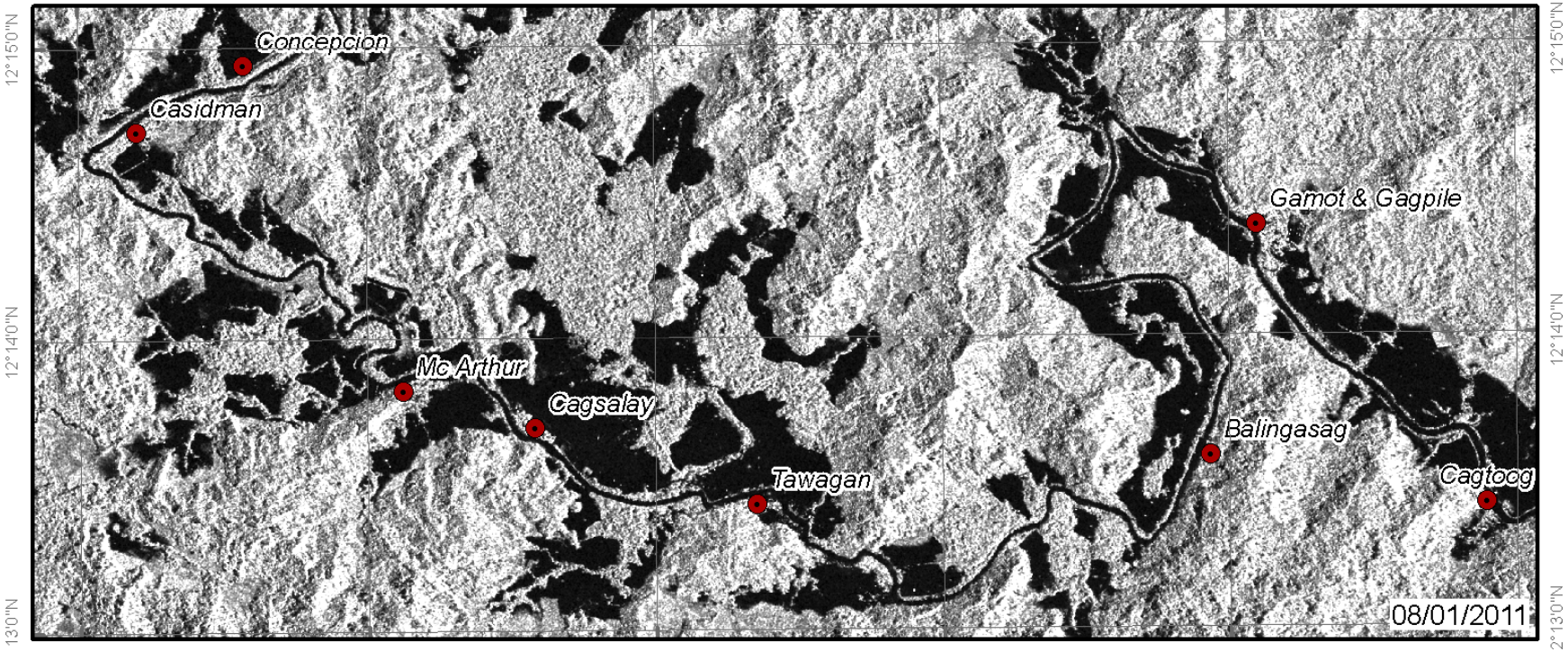


MARTINIS, S. (2010): Automatic Near Real-time Flood Detection in High Resolution X-band Synthetic Aperture Radar Satellite Date Using Context-based Classification on Irregular Graphs. Dissertation, Ludwig-Maximilians-Universität München.
MARTINIS, S., and A. TWELE (2010): A Hierarchical Spatio-Temporal Markov Model for Improved Flood Mapping Using Mult-Temporal X-Band SAR Data. Remote Sensing, 2(9), 2240-2258.

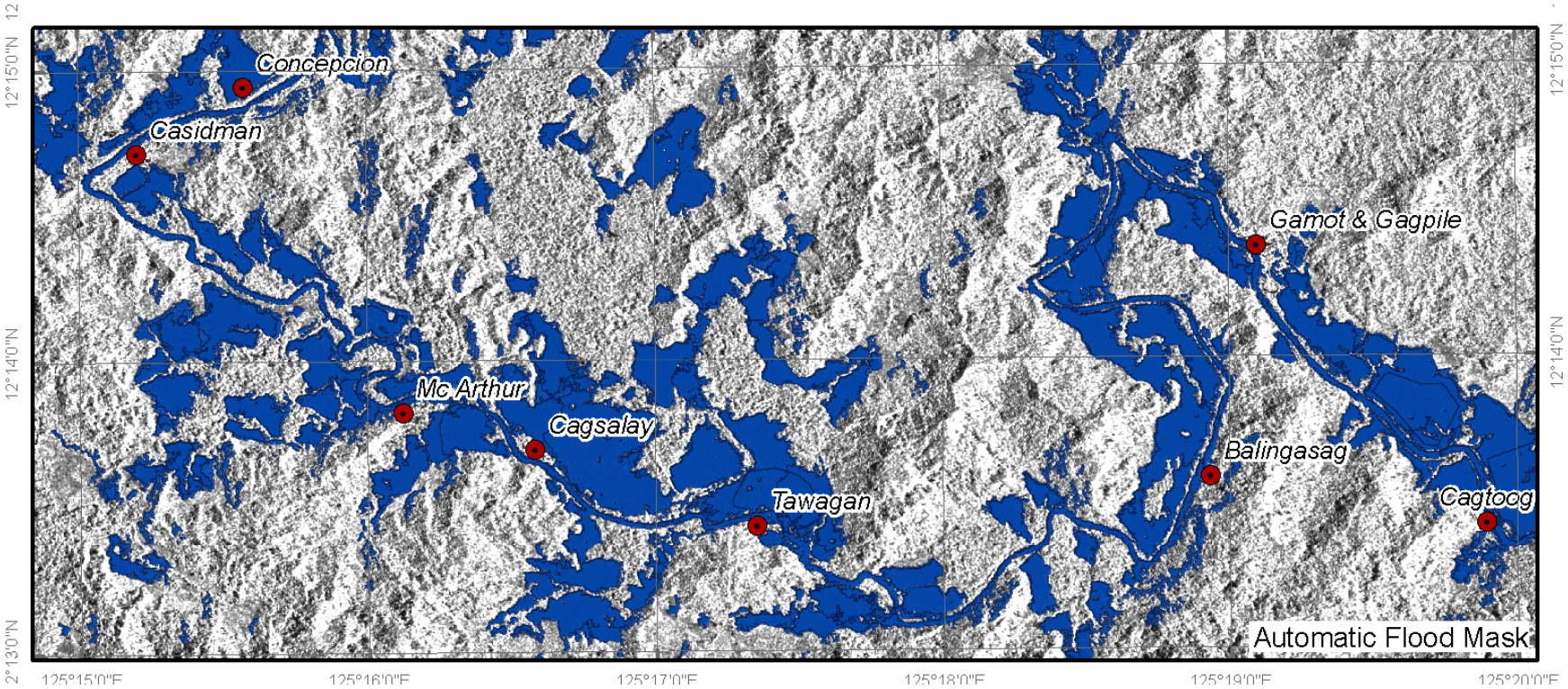
Risk Knowledge



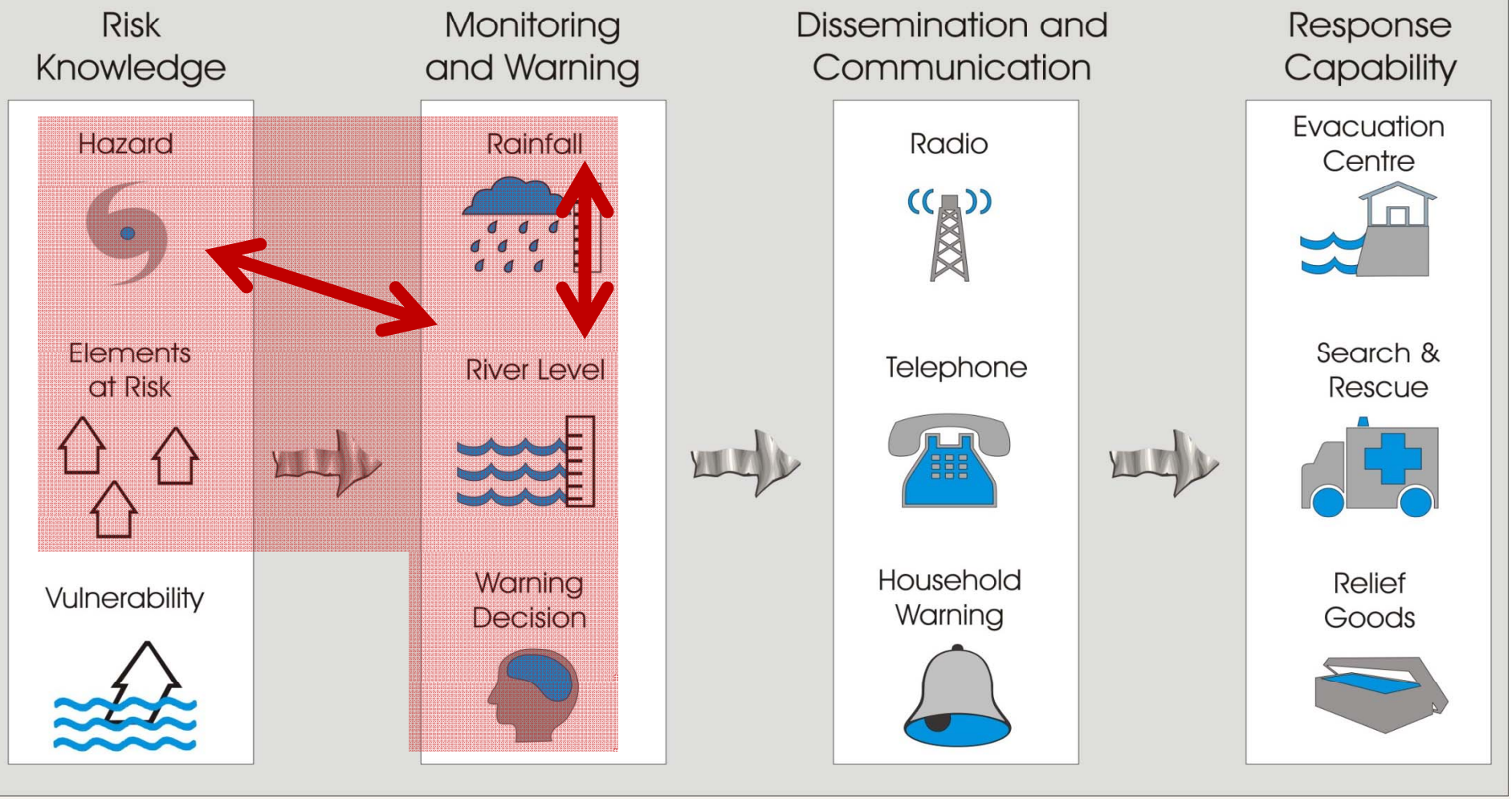
Risk Knowledge



Risk Knowledge



Key Elements of LFEWS



Summary

FEWS are depending to a large extent on terrestrial data collection (rain and water level).

The precision of the systems are enhanced with RS in areas with few ground data:

- Rain (TRMM) in Google Earth with watershed vector files
- DEM data for flood modelling
- Radar data for flood extent maps and better risk communication

Better timing and localizing of warning and evacuation mean better performance of the FEWS.

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THANK YOU

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