Flood Forecast in Rwanda

Case studies: Volcanoes Area, Sebeya Catchment and Mpazi Sub-catchment

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OUTLINE

- Conceptual framework
- Field investigation
- Technical assessment
- Flood simulation
- Conclusion

Expectation: Understand the concept of flood forecast (tool) and its real life application in Rwanda

CONCEPTUAL FRAMEWORK

Field investigation

- Understanding of the problem on the field,
- Local people perception of the problem

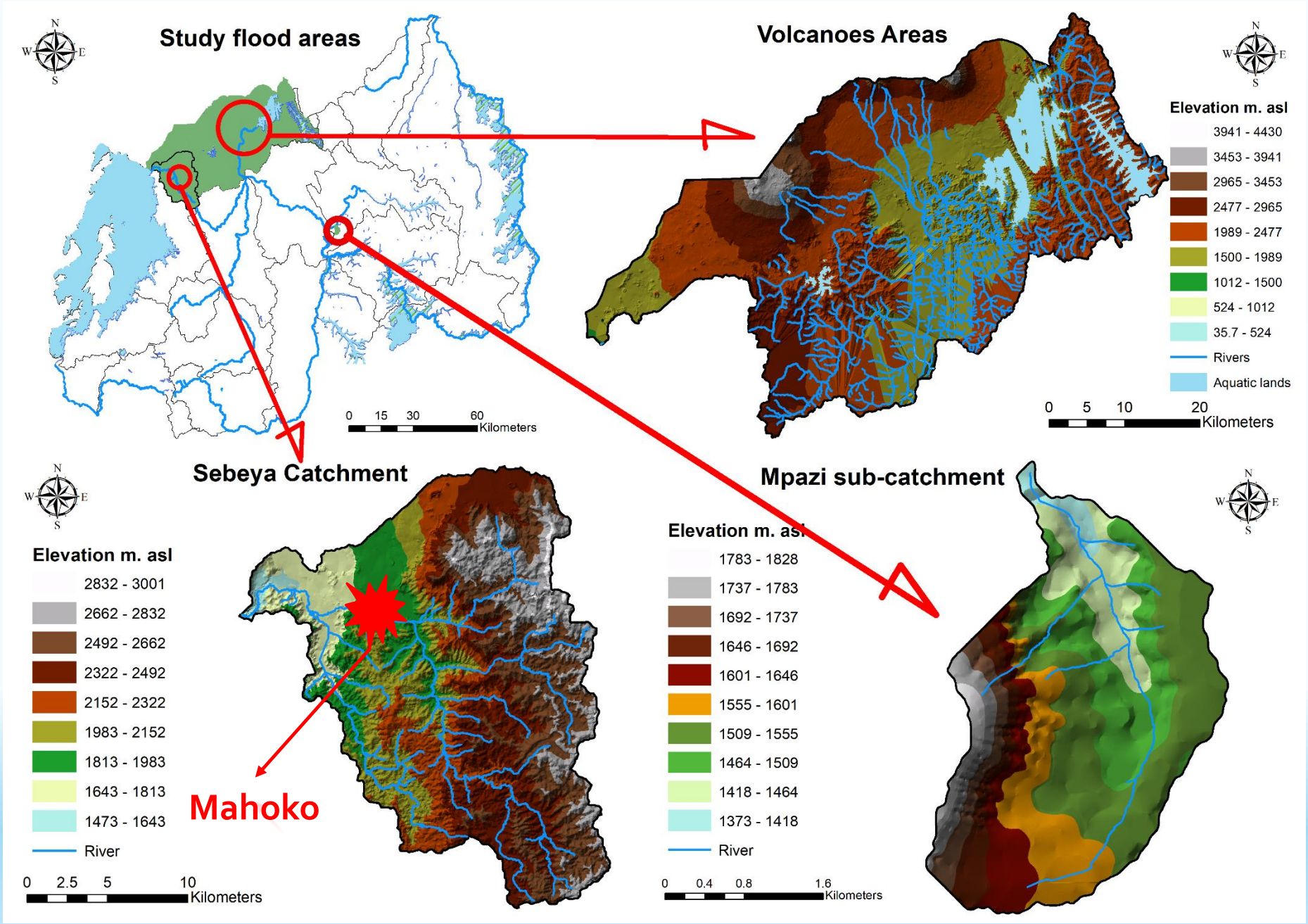
Technical assessment

- Hydrologic model development,
- Calibration of the model,
- Hydrological behavior understanding

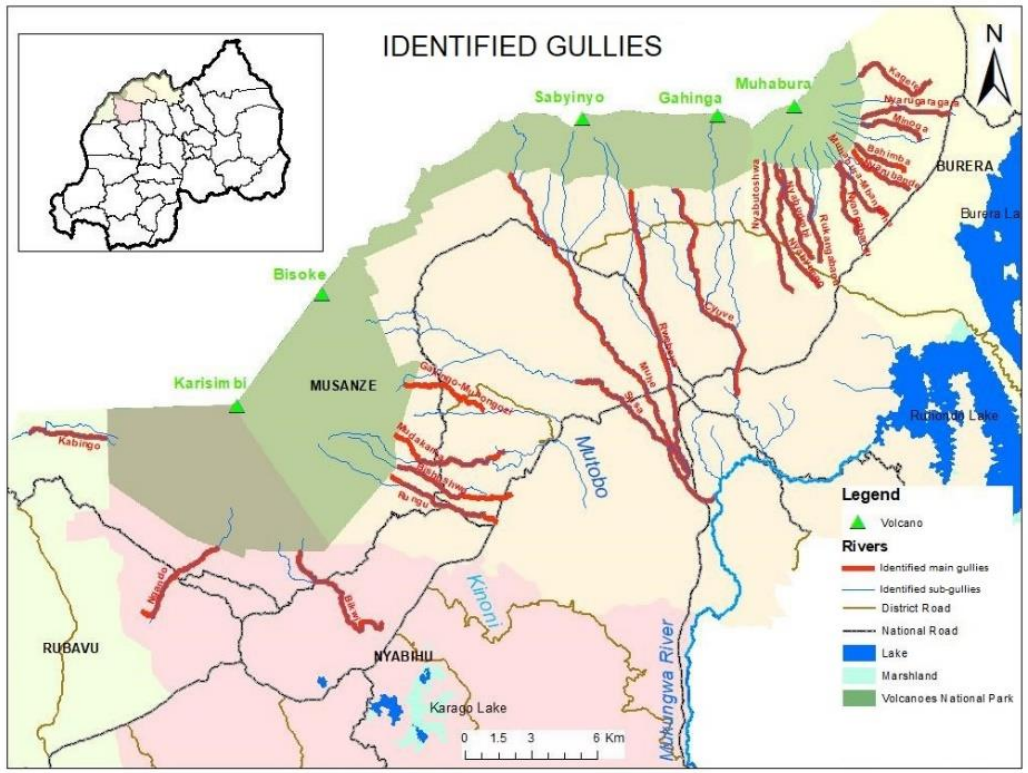
Flood simulation

- Flood extent mapping,
- Flood risk assessment,
- Mitigation measures assessment

FIELD INVESTIGATION (STUDY AREA)



FIELD INVESTIGATION (VOLCANOES AREAS)



- Flashfloods (22 gullies in 4 Districts)
- Inadequate infrastructure planning
- Heavy erosion (boulders)

Muko Sector, Susa Gully

Nyarugaragara gully crossing Musanze – Cyanika road

FIELD INVESTIGATION (SEBEYA CATCHMENT)

- Heavy erosion (boulders and sand)
- Flashfloods from gullies
- Overflow from Sebeya
- Critical area Mahoko center

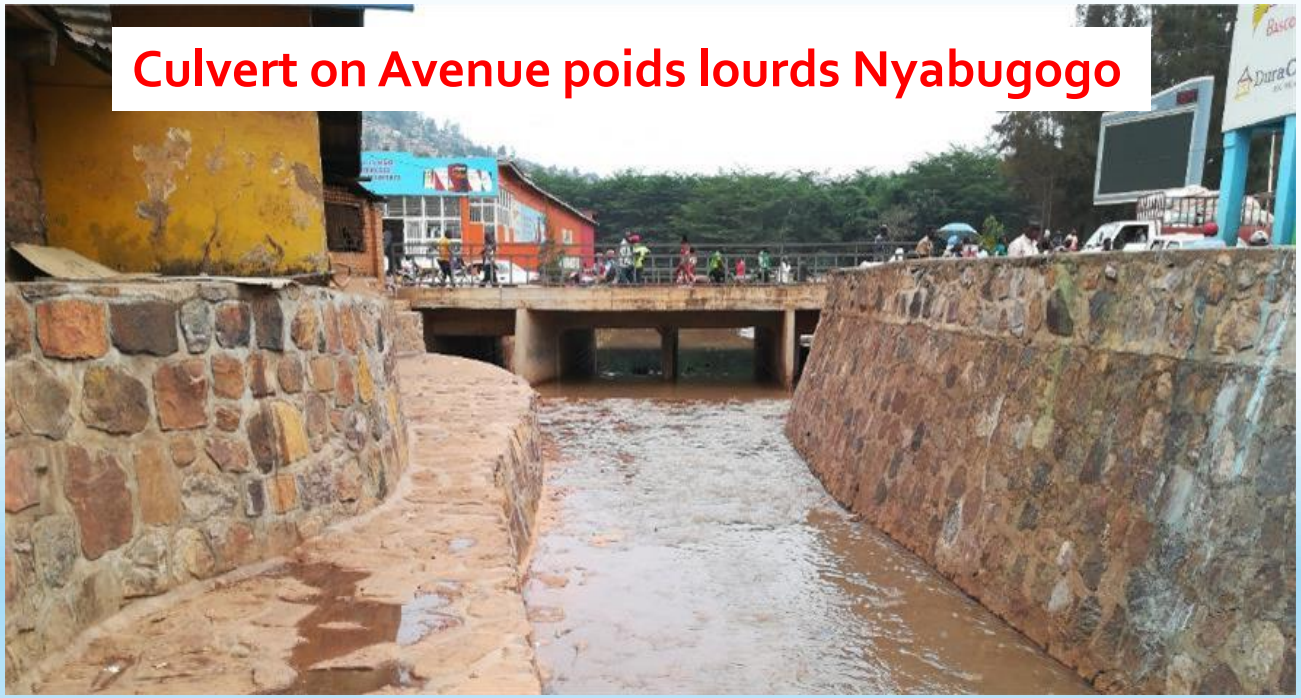
Gisunyu gully crater

Karambo sediment transport

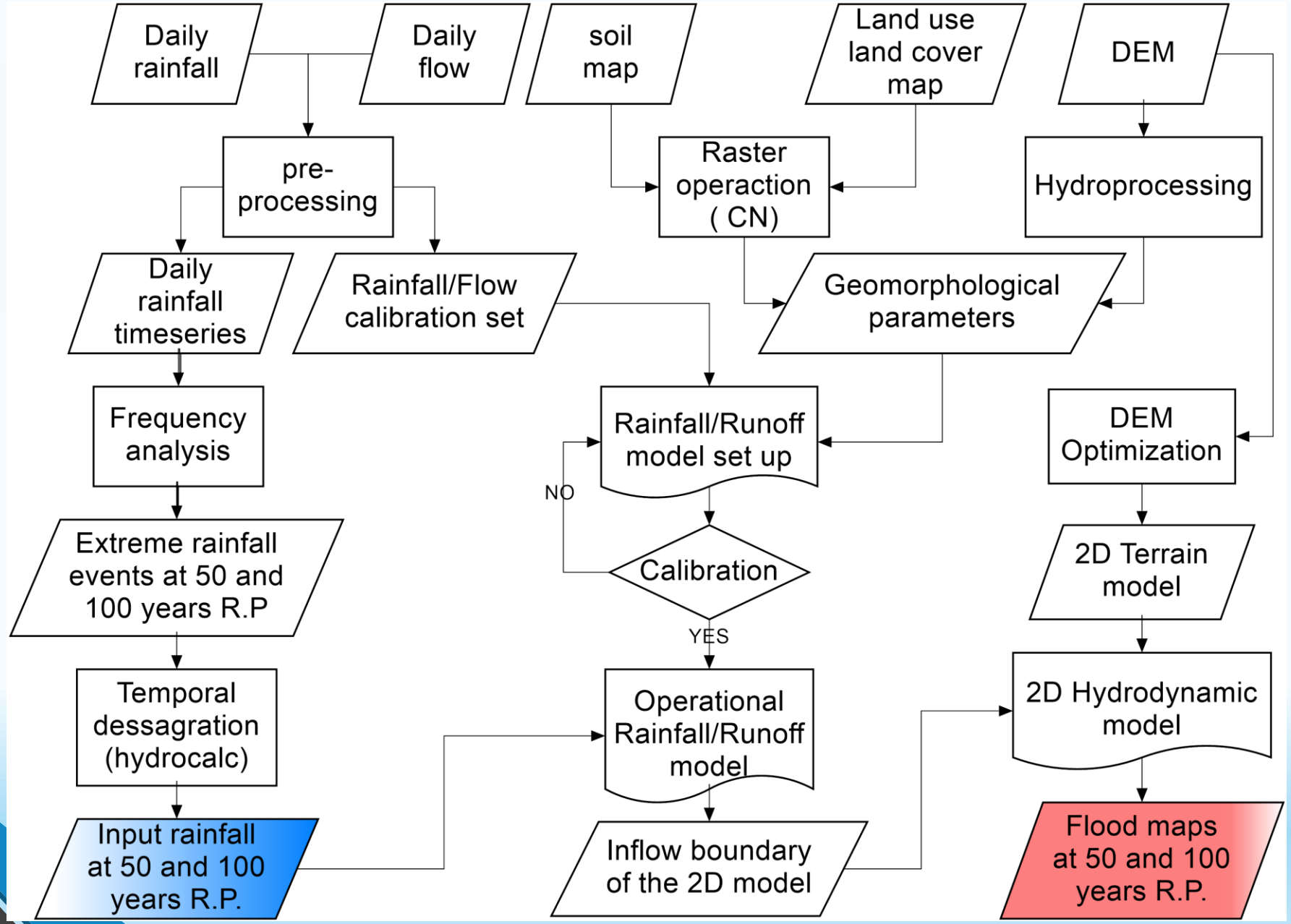
No sediment consideration in the design of hydraulic structures in these areas

FIELD INVESTIGATION (MPAZI SUB-CATCHMENT)

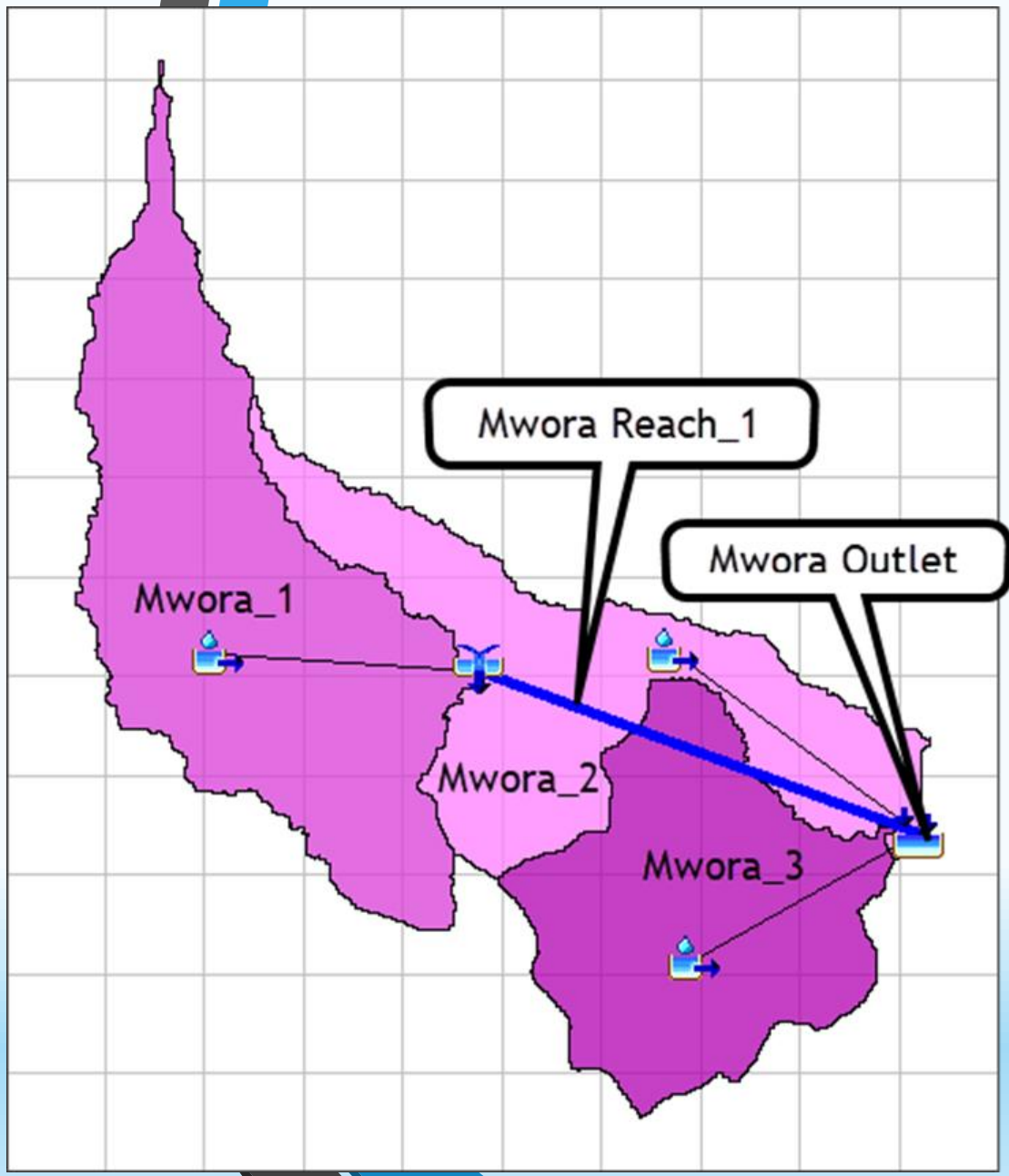
- Very high urbanization
- Flashflood
- Inadequate infrastructure planning
- Backwater effect



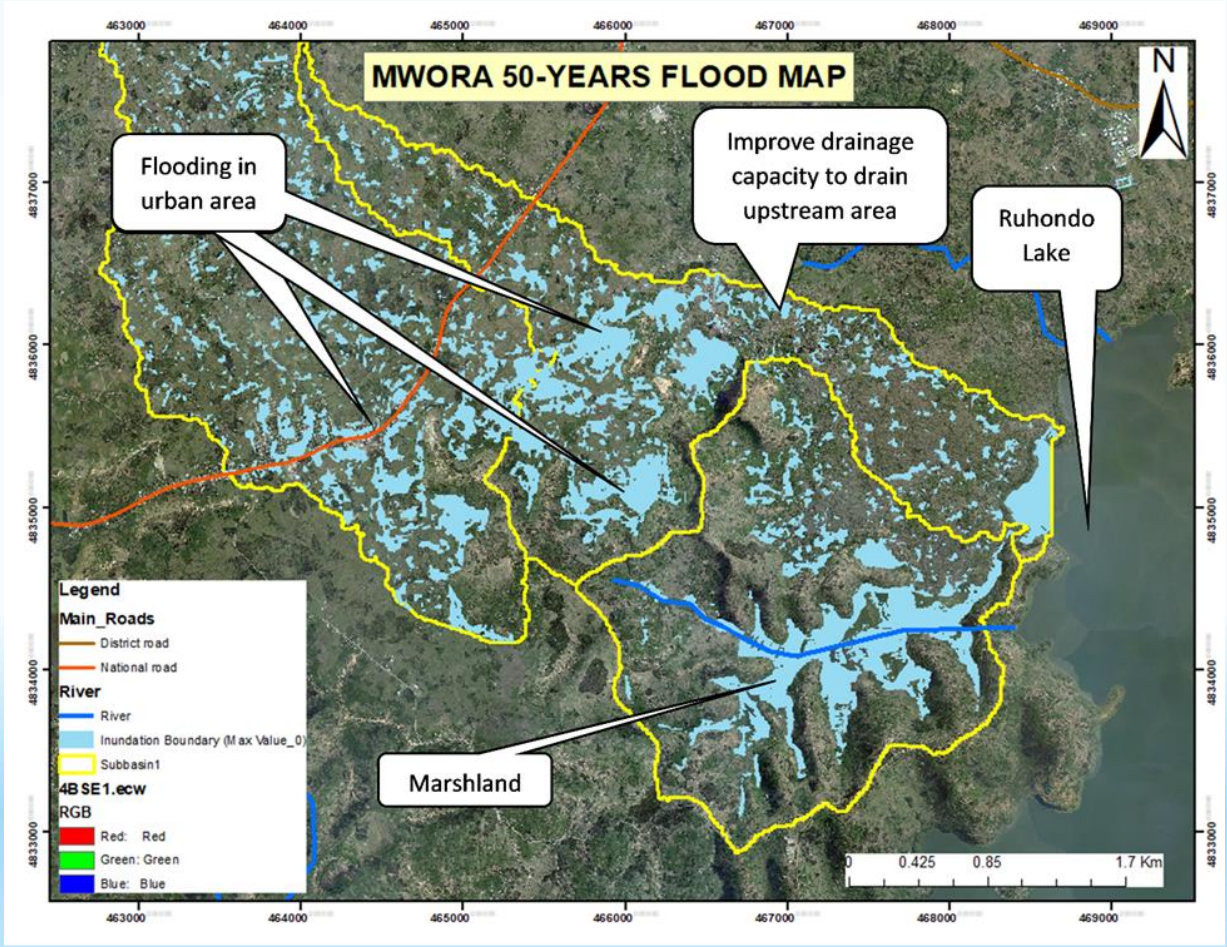
TECHNICAL ASSESSMENT



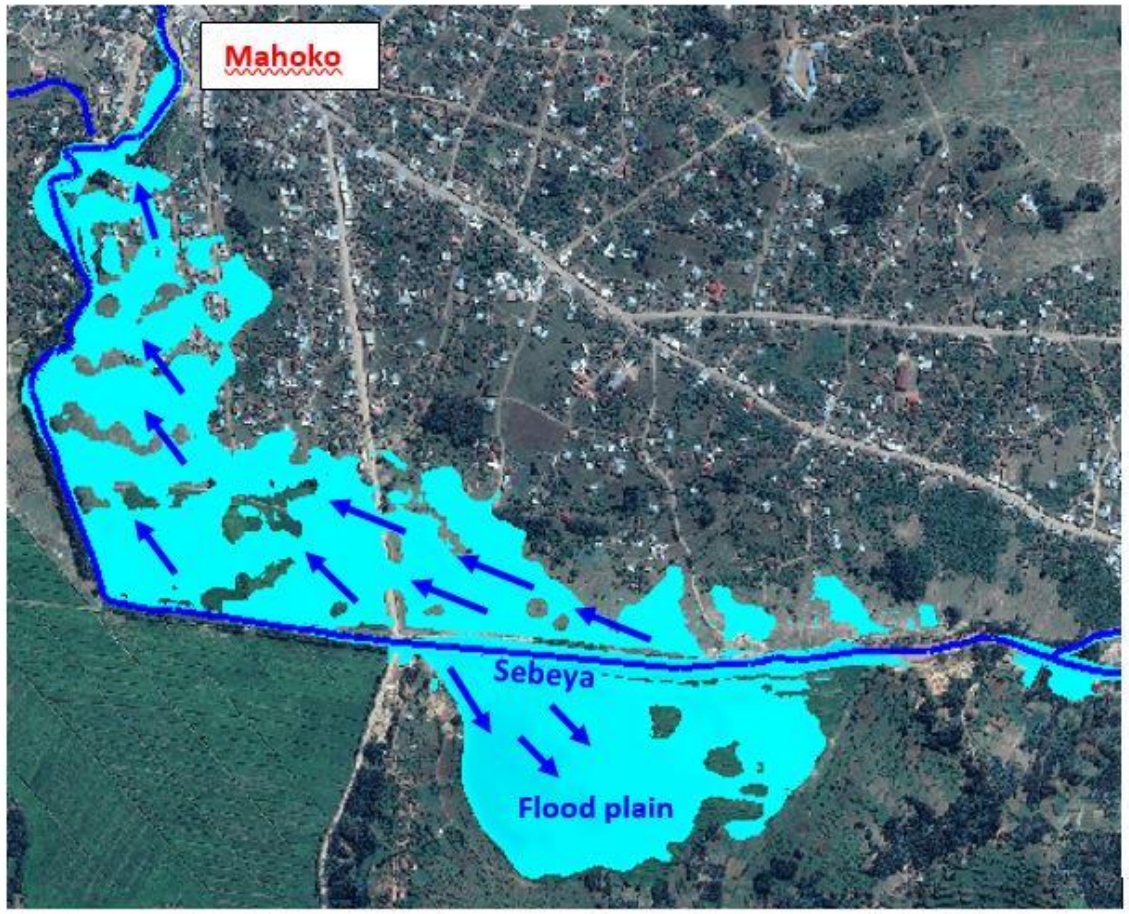
FLOOD SIMULATION (VOLCANOES AREAS)



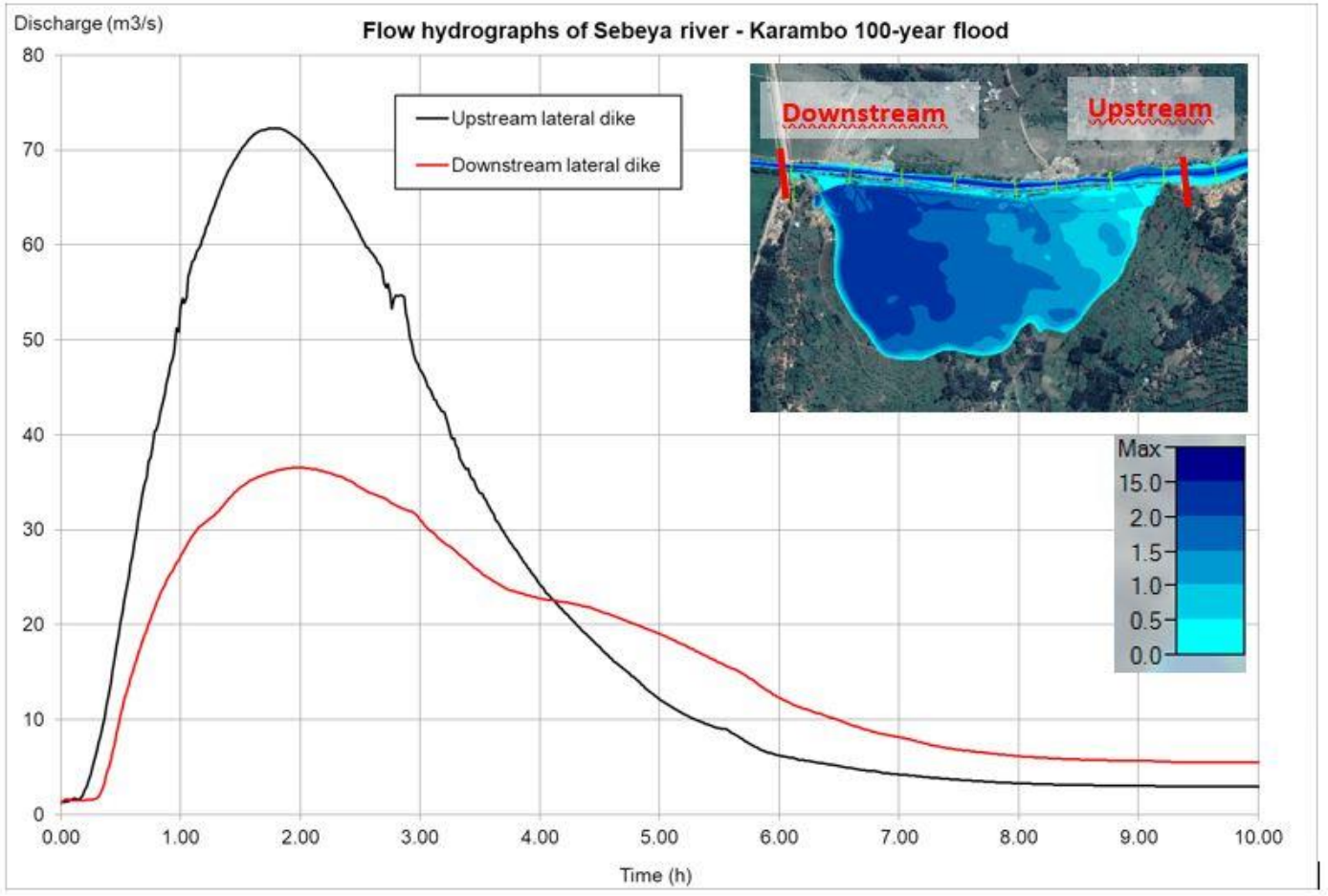
Gully	Reach	Drainage Area (km^2)	Design Flows				
			2-YEAR	5-YEAR	10-YEAR	50-YEAR	100-YEAR
Mwora	Outlet	16.06	20.5	31.8	39.3	56.4	63.7
Mwora	Reach 1	6.88	6.6	11.2	14.3	21.6	24.9



FLOOD SIMULATION (SEBEYA CATCHMENT)

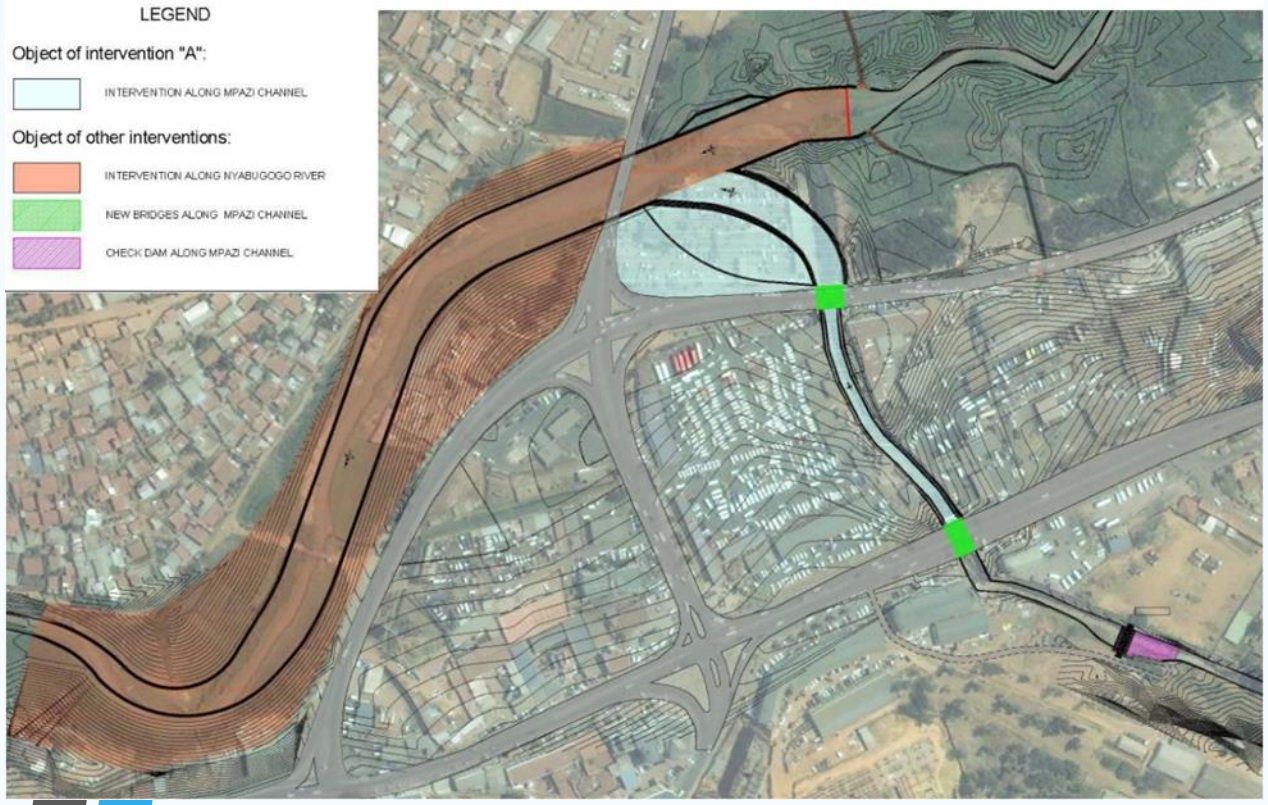


Flood extent at the confluence Sebeya/Karambo

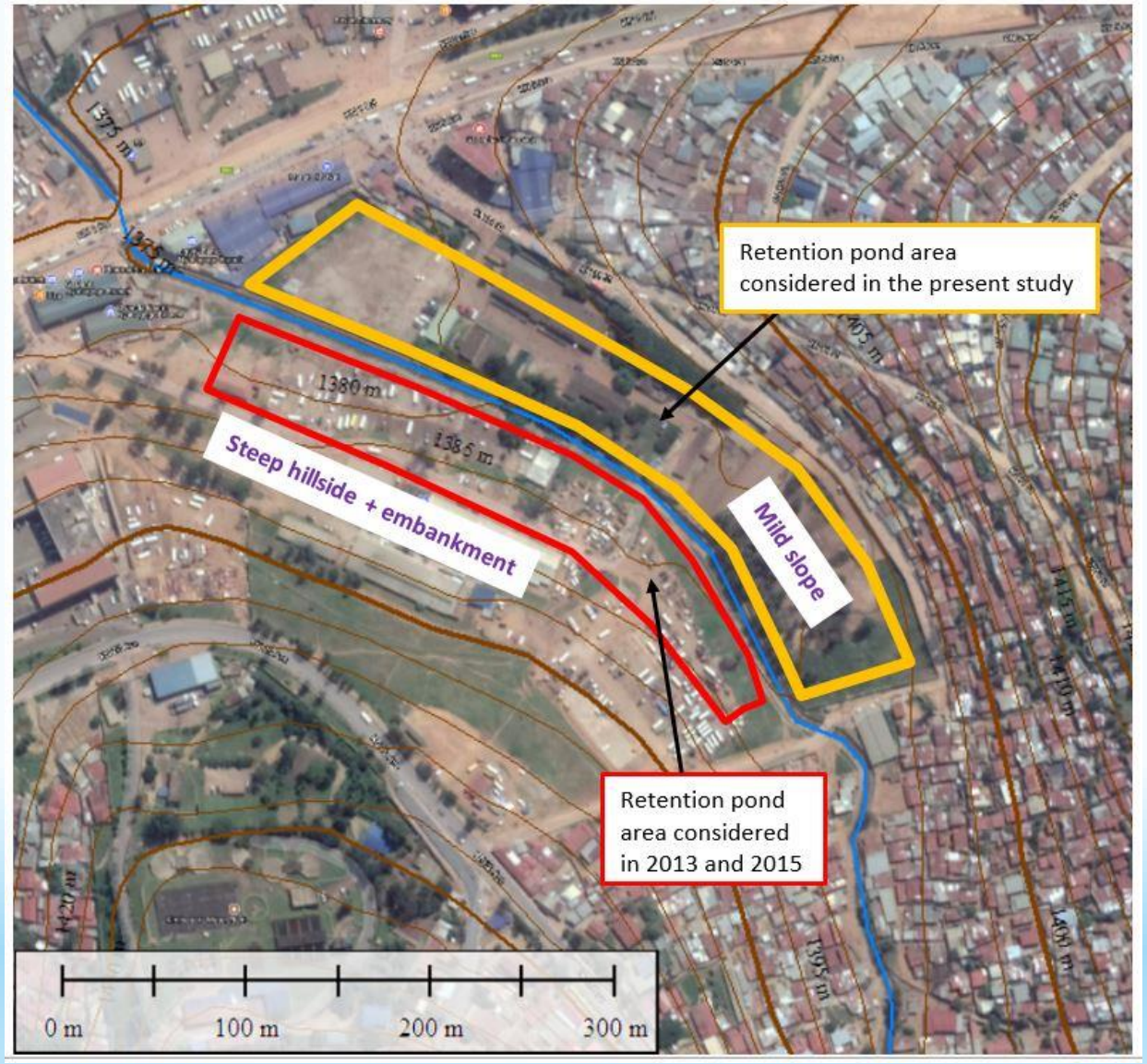


Assessment of mitigation measures

FLOOD SIMULATION (MPAZI CATCHMENT)



Alternative flood mitigation measures design and cost benefit analysis



CONCLUSION

- In this presentation, one basic component of flood forecast presented is the development of a **flood management tool for flood control**
- It is an **effective approach** for data scarce area like Rwanda
- **Downfall**: requires high level of expertise in modeling for its application

THANK YOU VERY MUCH

FOR YOUR ATTENTION