Objectives

Reservoir Sedimentation and Socio-Environmental Impacts:
1. Steep Mountain Channels and Sabo Dams;
2. Reservoir Sedimentation;
3. Sediment Removal;
4. Locks and Dams and Estuary Barrages;
5. Effects Downstream of Reservoirs;
6. Socio-Economic Impact.

1. Steep Mountains and Sabo Dams
Upper Basin: high-elevation snowpack; snowmelt runoff

Diverse Topography: highest mountains in Colorado – Elbert, Massive, Harvard, etc.

Lesser Himalayan Area
2. Reservoir Sedimentation

Wonogiri survey paths
Fuensanta reservoir of the river Segura in Spain

Bengal and Indus
3. Mechanical Removal and Sediment Flushing

Impact of Sedimentation
4. Locks and Dams and Estuary Barrages

Locks and Dams

CASC2D-SED Modeling 2004

L&D No. 3
Sedimentation Problems Can Be Solved
Nakdong River Estuary Barrage

Quasi-steady state model

(Model validation 2003 – with dredging)
5. Effects Downstream of Reservoirs

Plan view from Main dam to Re-regulation dam

Hapcheon Re-regulation Dam

Discharge at main dam
Discharge at re-regulation dam

119 m³/s during 3 hr per day
20 m³/s during 24 hr per day
Study Reach

Hapcheon Main Dam
Re-regulation Dam
Nakdong River
Study Reach = 45 km
Hapcheon city
Degradation and armouring

Variation of Non-vegetated Active Channel Planform
Variation of Non-vegetated Active Channel Width

River changes below Hapcheon dam

Median Bed Material Size ($d_{50}$) along the study reach
6. Socio-Economic Impacts: Case Study in Haiti

Example: Peligre Dam in Haiti
Sedimentation Problems Can Be Important

Peligre Dam (sedimentation)

Hurricane Impact
Could this be avoided?

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Erosion and River Mechanics Textbooks

Erosion and Sedimentation

River Mechanics

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THANK YOU for your attention!

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