



# PRESENTATION 4: Overview of dam site physical location and elements

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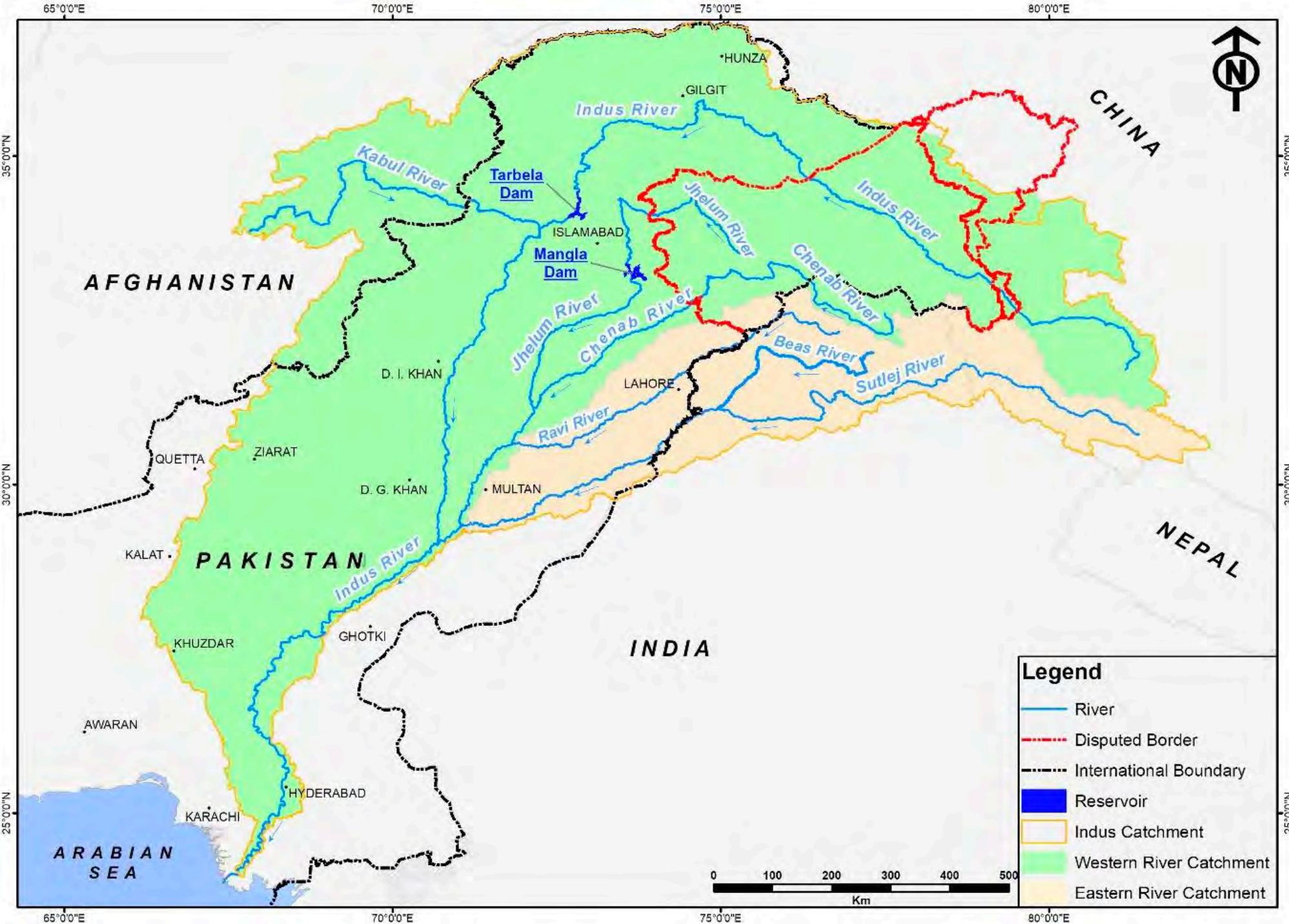
**25 April 2024**



# Geography and topography

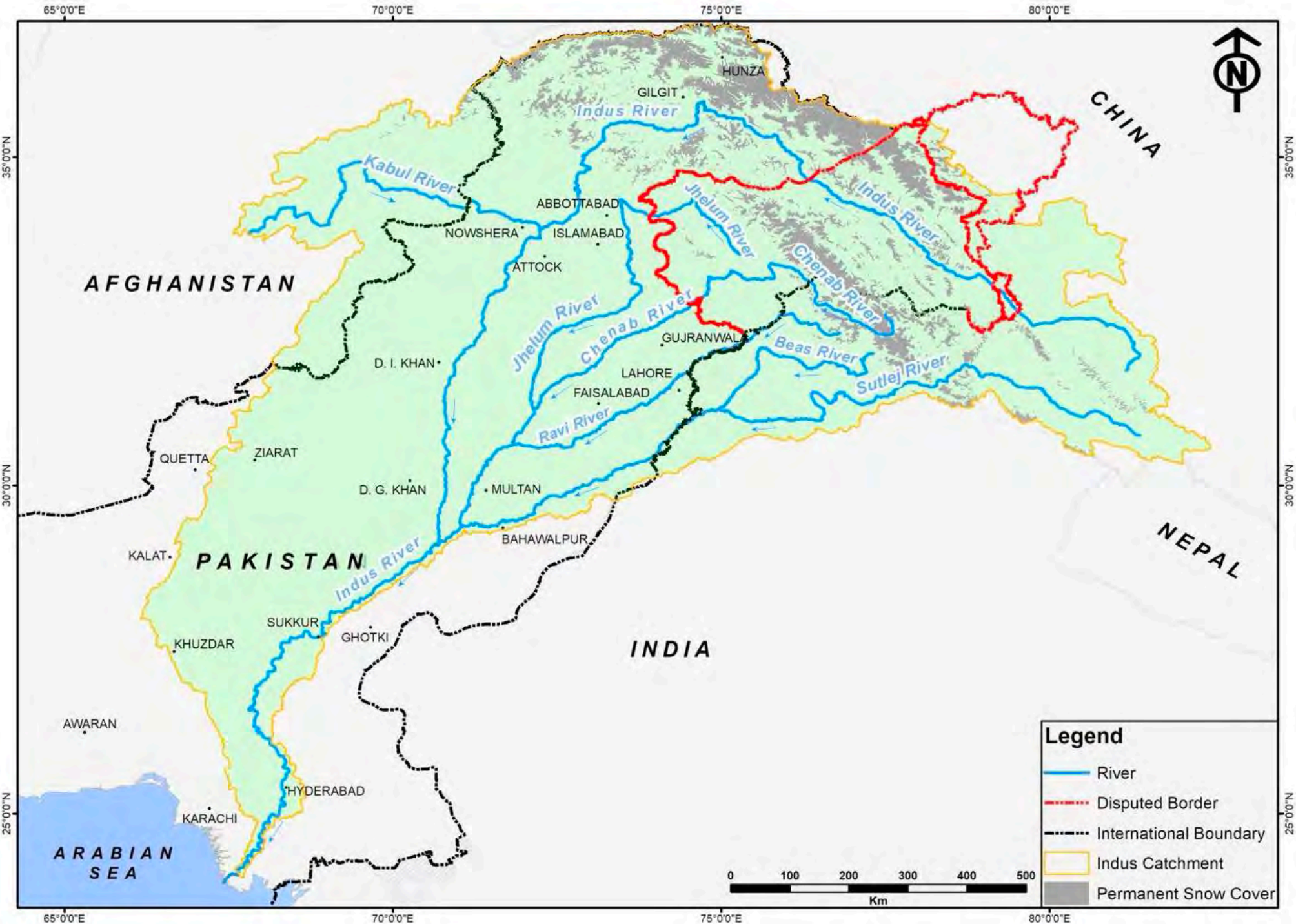


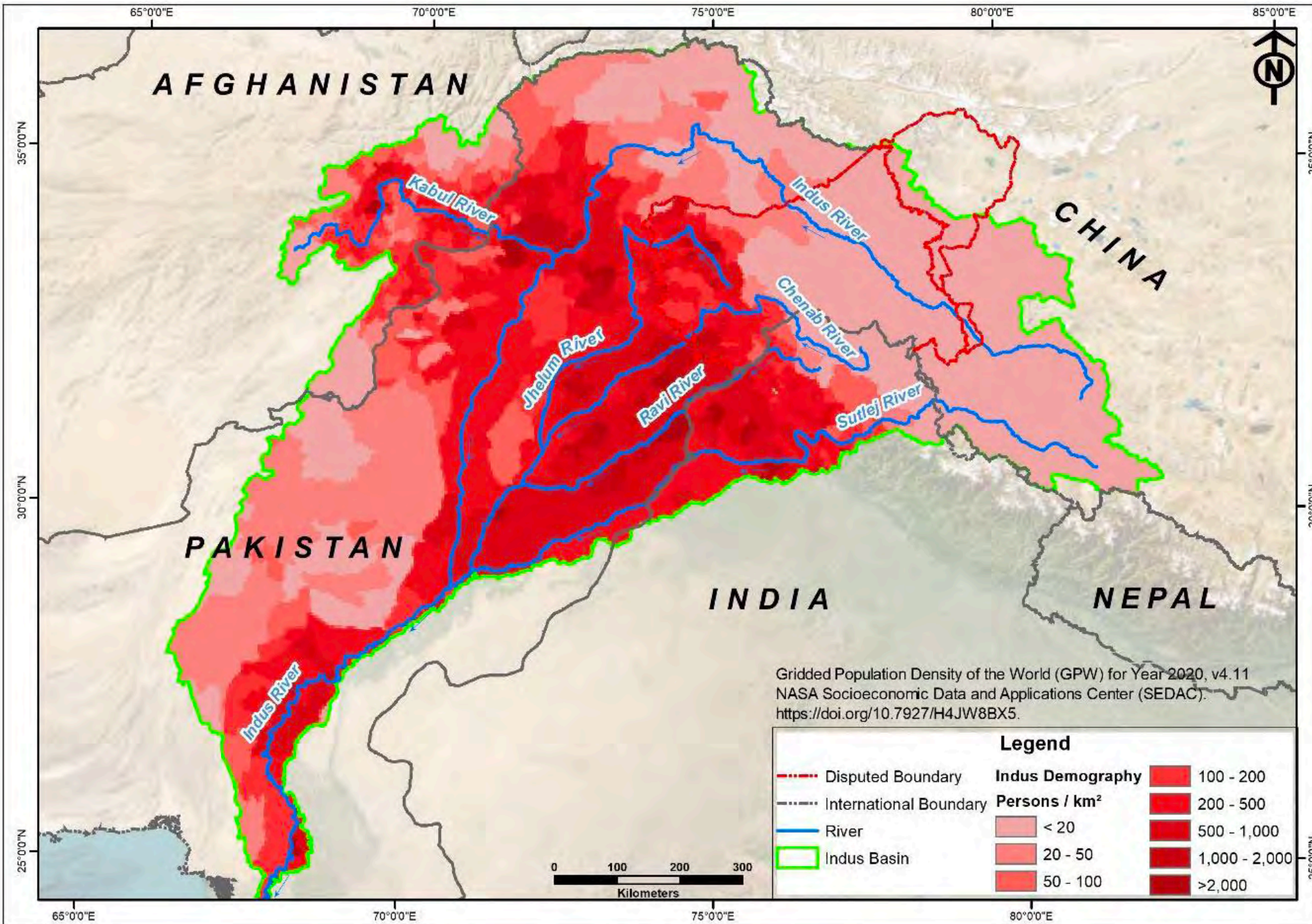
# Indus basin





# Glacier and snow cover



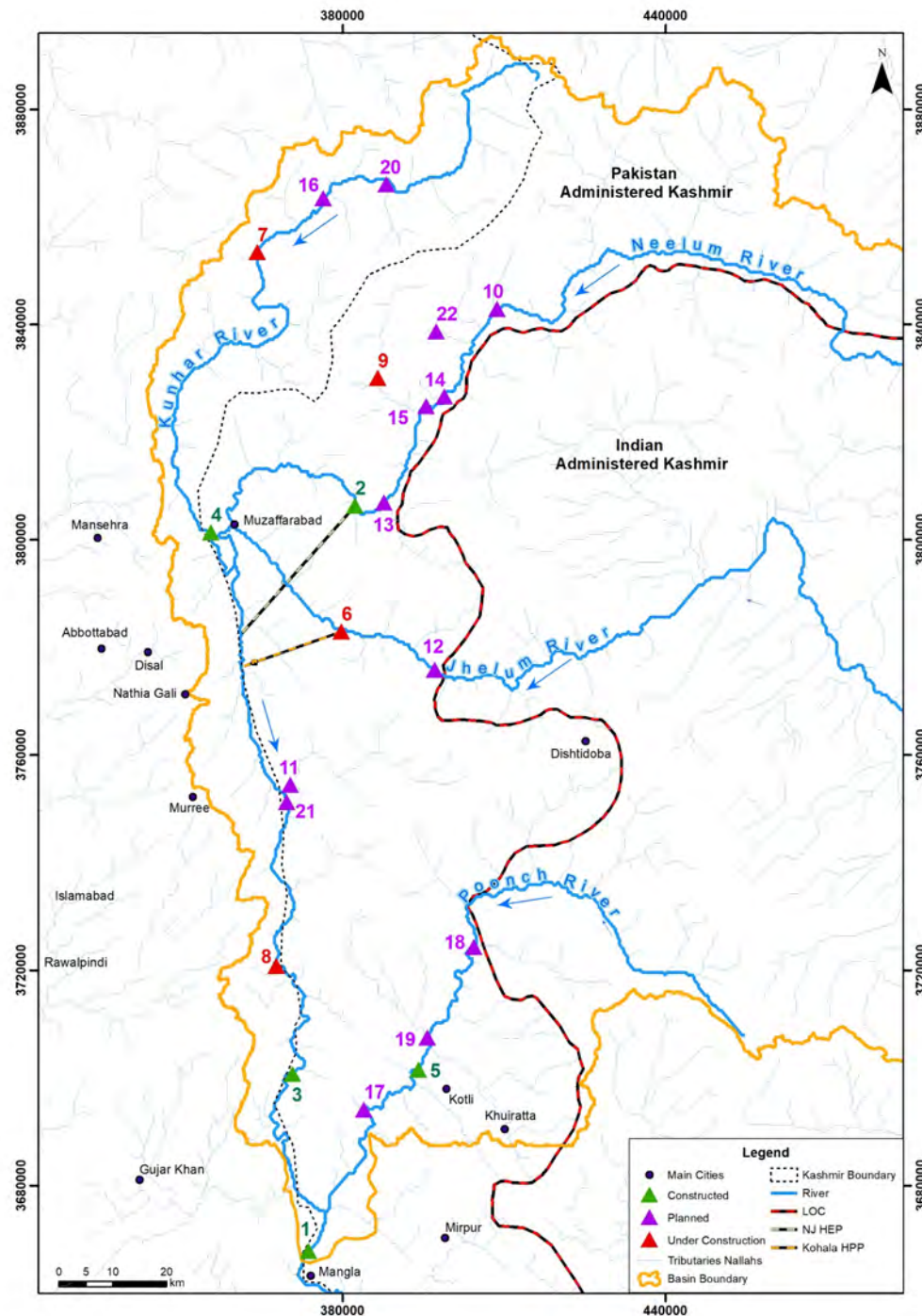


# Population density



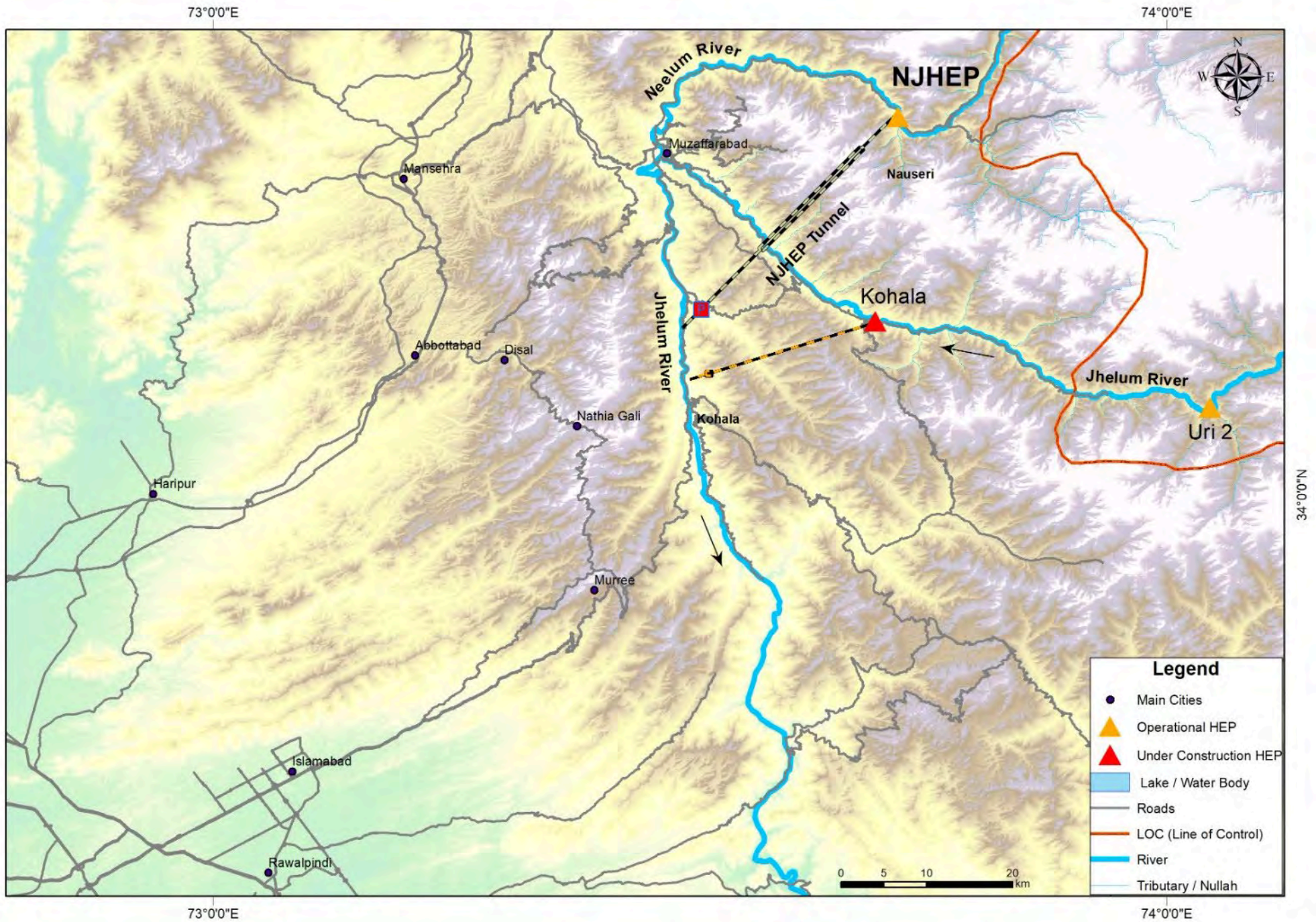
# HEPs and power planning

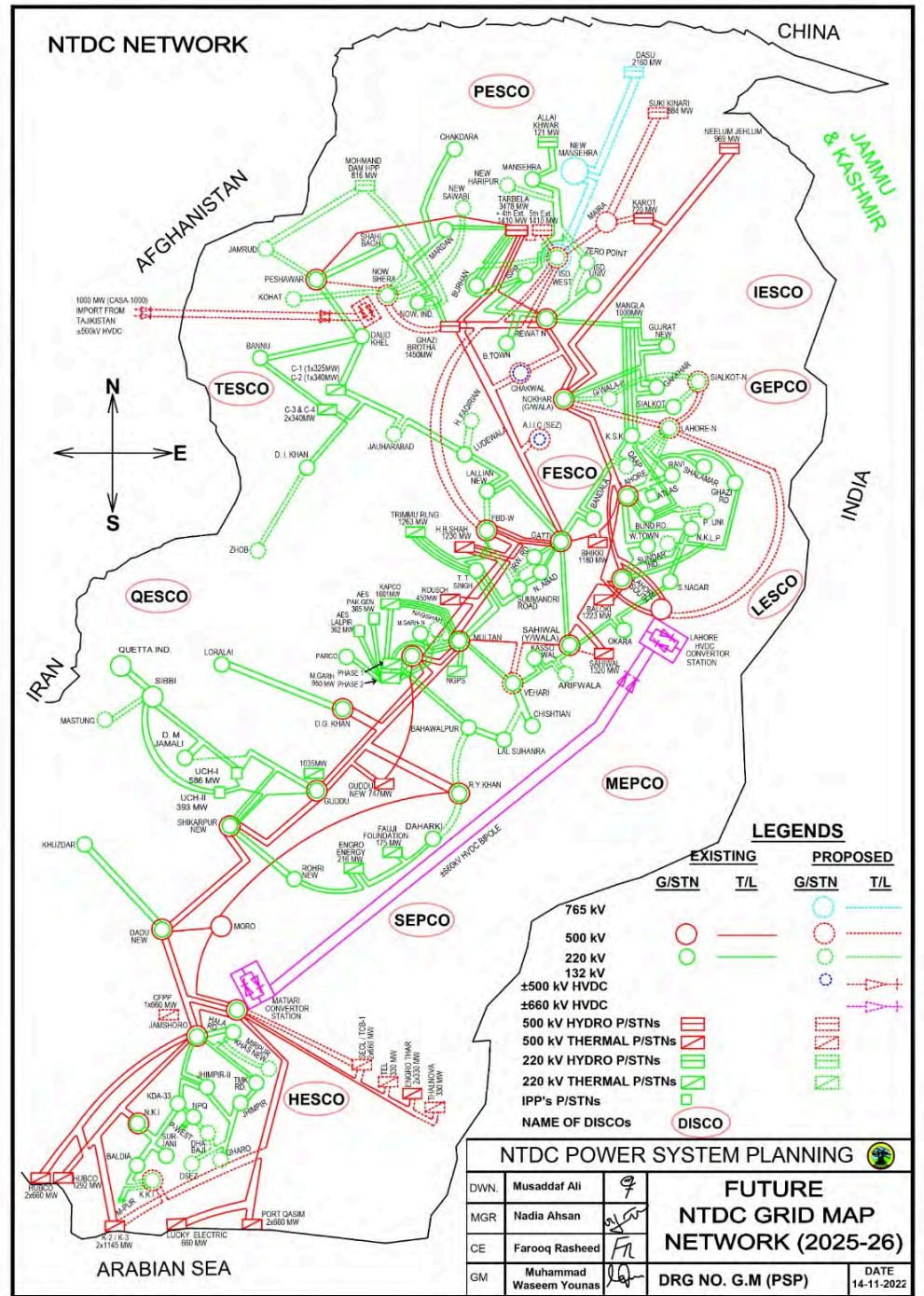
- Unless created to serve an isolated community only, HEPs form part of a power system or **grid**.
- If one HEP is **deficient**, that does not make it ineffective – other plants may take up the load within the grid.





# Main demand centres and HEPs





# Transmission lines





# Inundation

- The principal immediate impact of any HEP is caused by the **filling of the reservoir**, which blocks the valley and causes the water to rise to the level of the dam (or over it, if flow is not controlled).
- While theoretically optional, a reservoir will give a run-of-river HEP **live storage** (if needed) and create **generating head**.
- The reservoir in a **long, narrow valley** will be along the length of the valley and constrained by its sides. As a consequence, the reservoir itself may be **many kilometres long**.

Image of January-2011  
Pre-impoundment Scenario



Dam axis

Reservoir Rim  
at Full  
Pondage Level  
(1015.0 masl)

Image of September-2022  
Post-impoundment Scenario

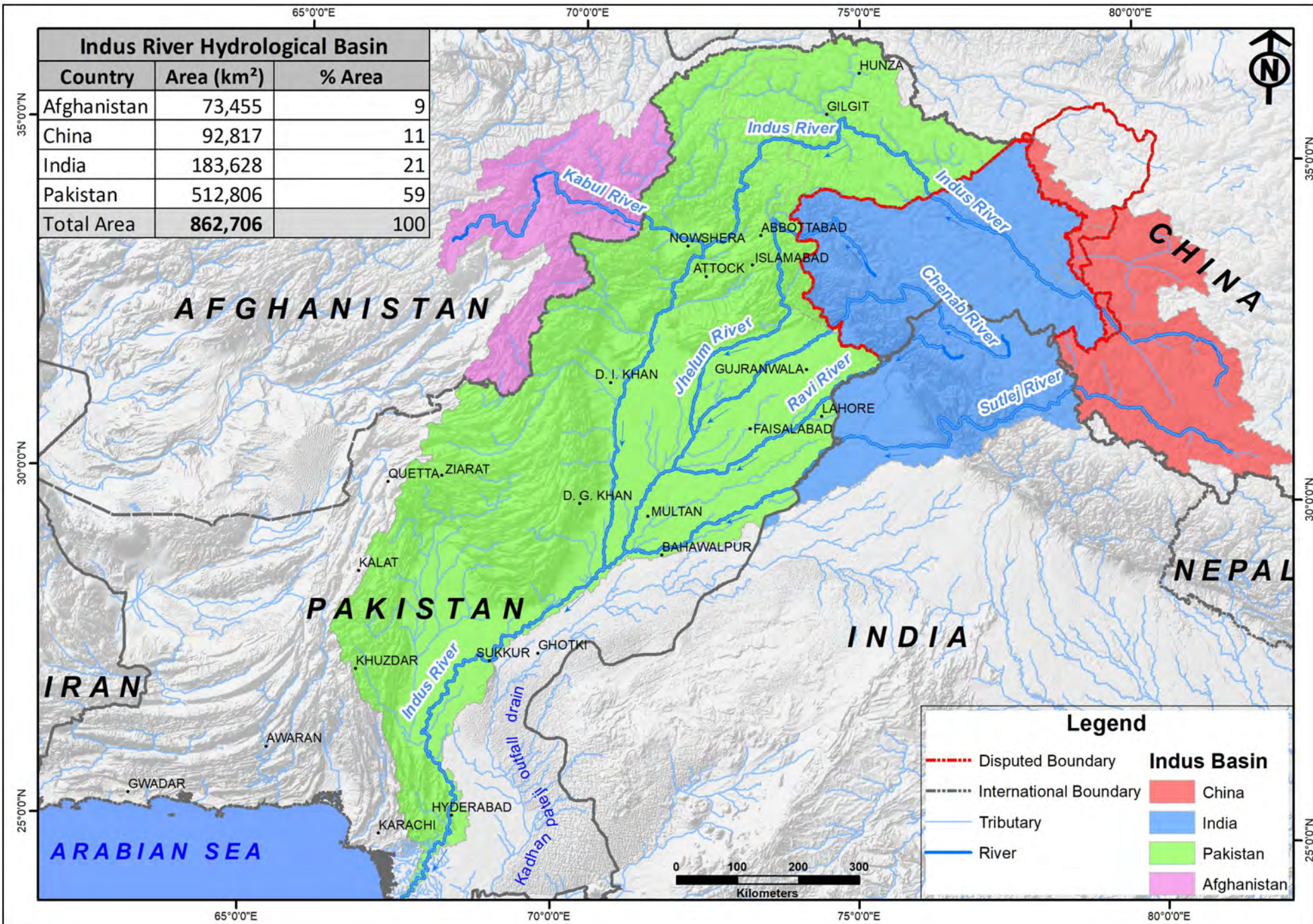


Dam axis

Reservoir Rim  
at Full  
Pondage Level  
(1015.0 masl)



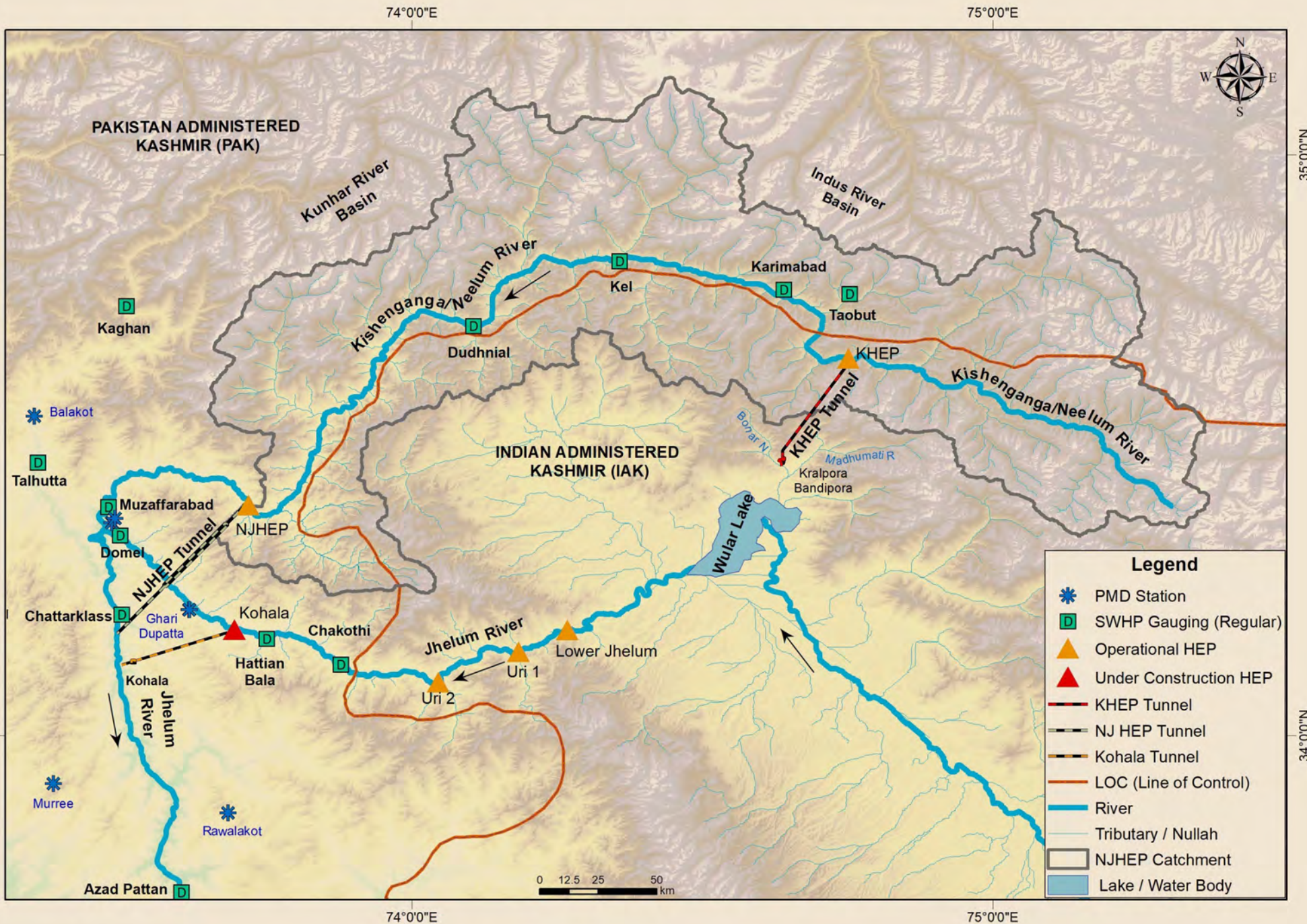
# Hydrology

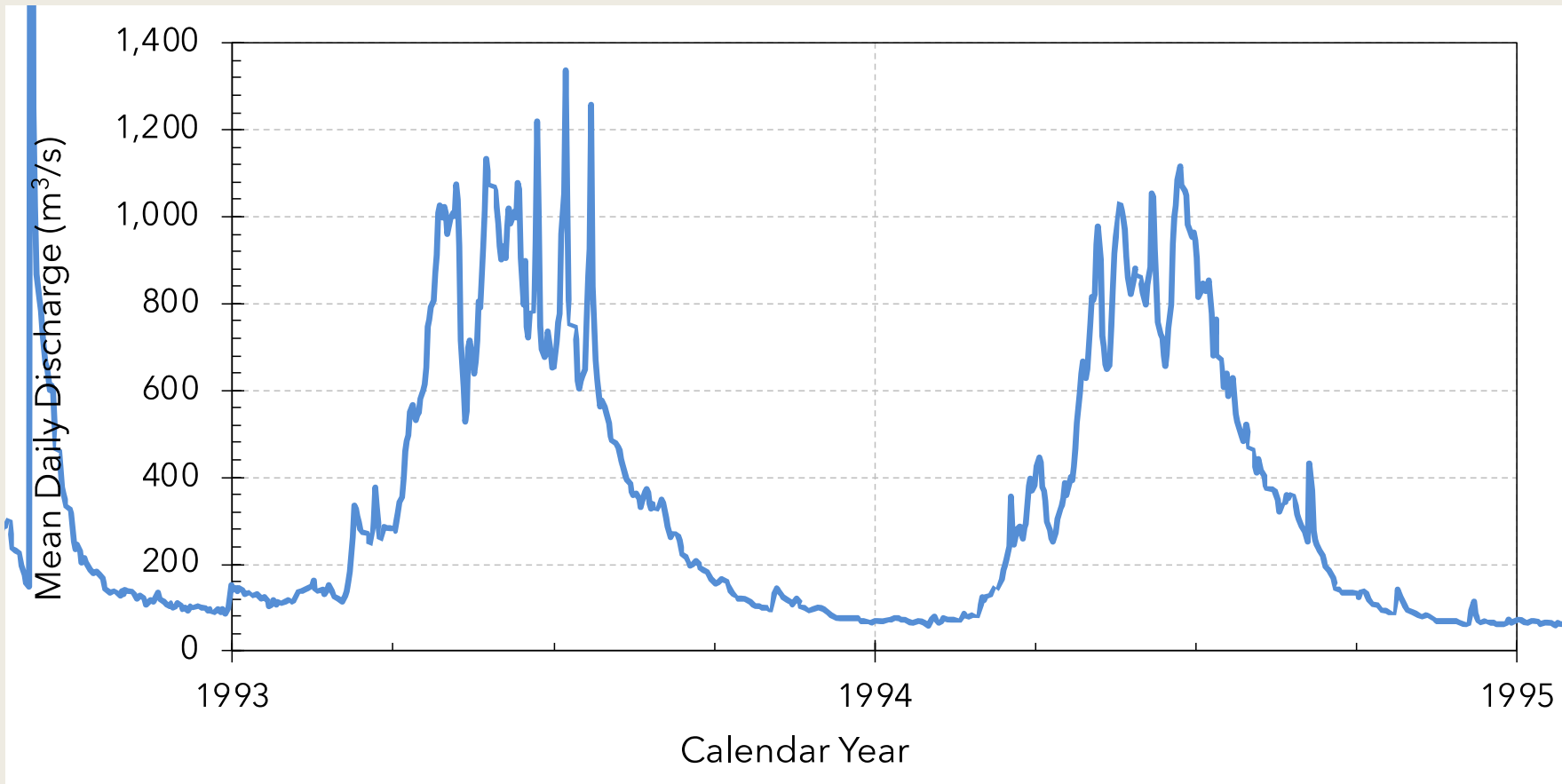


# Watershed overview

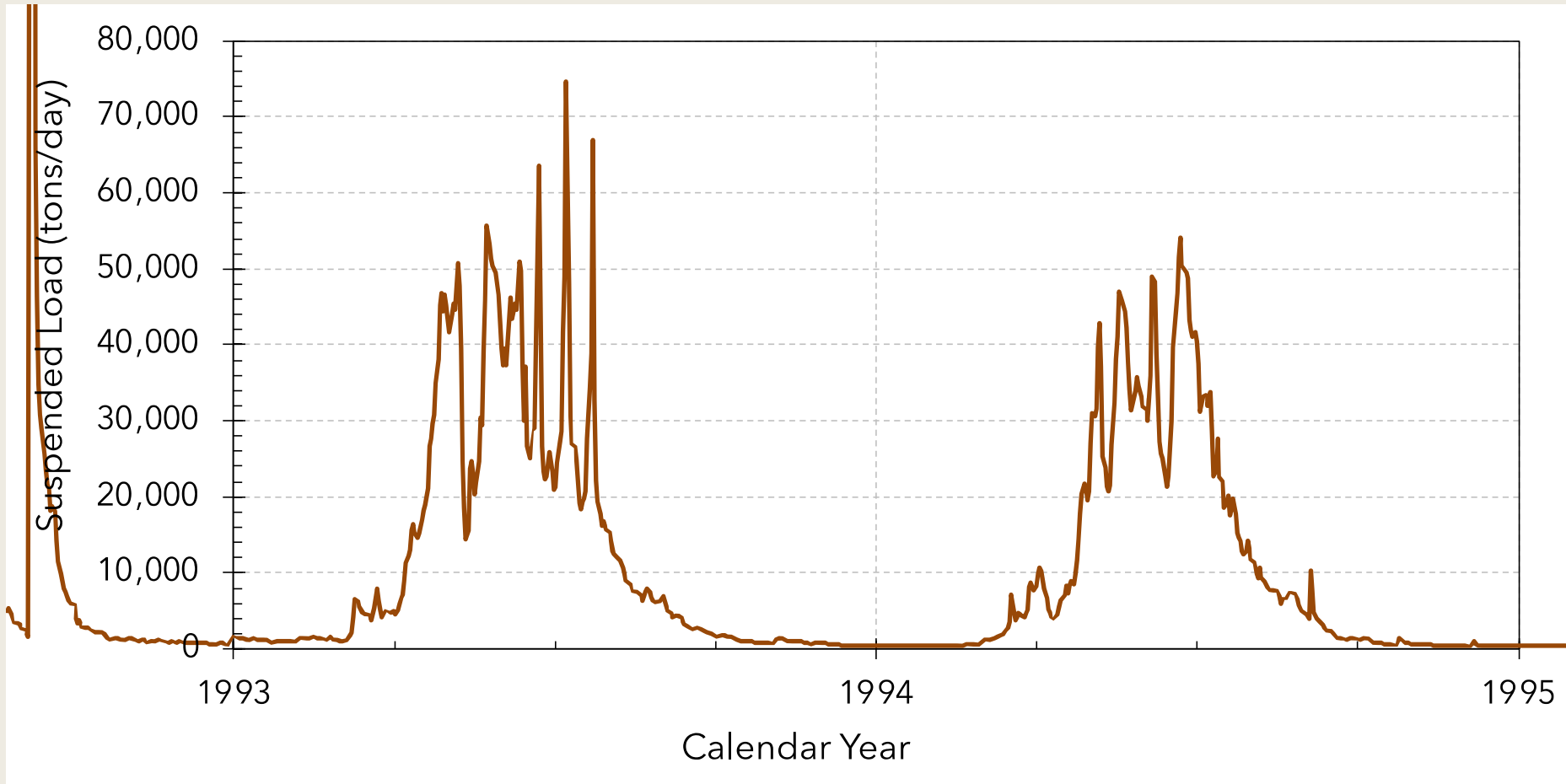


# Tributary map



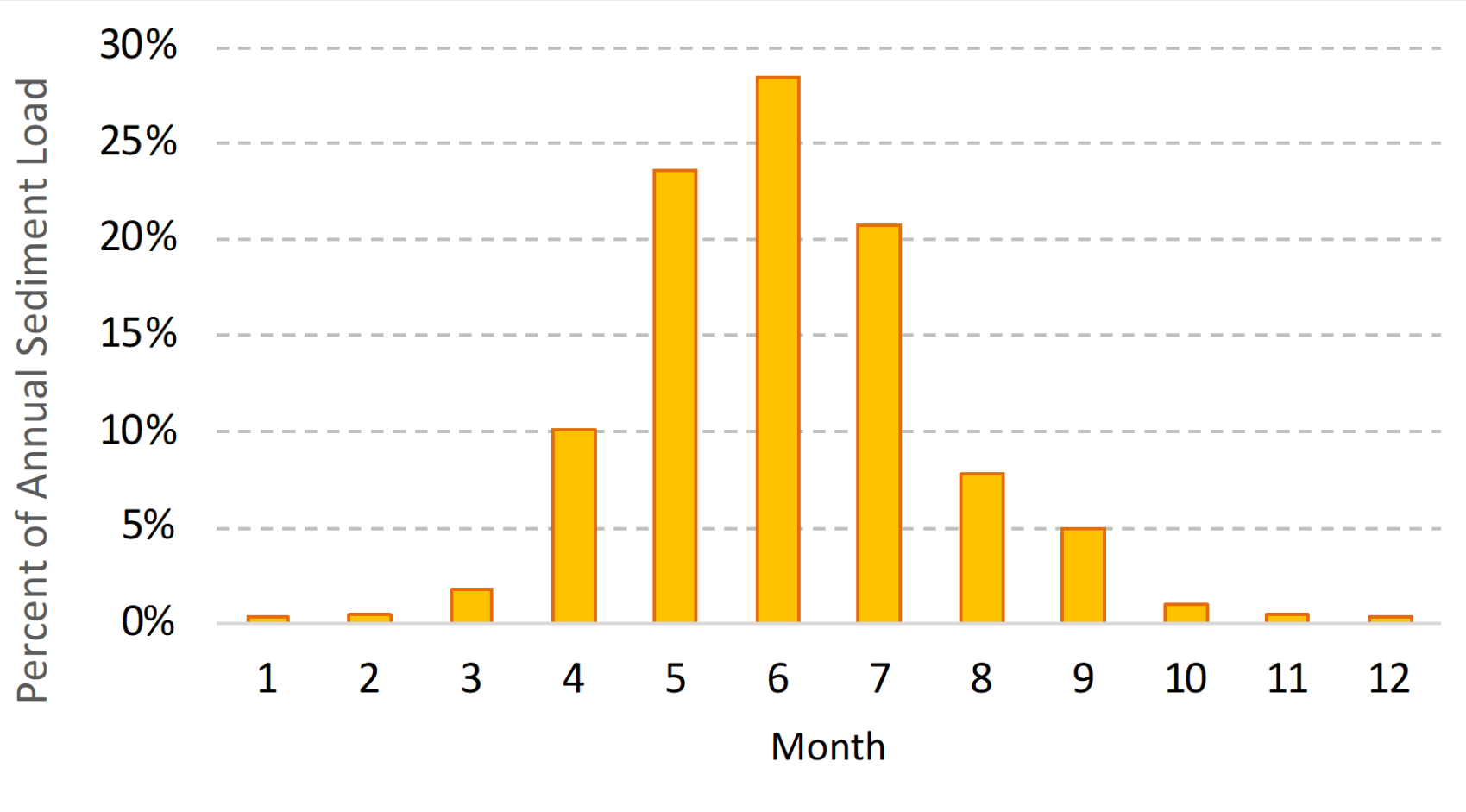


**NJHEP**  
**daily**  
**inflow**



# NJHEP daily sediment inflow

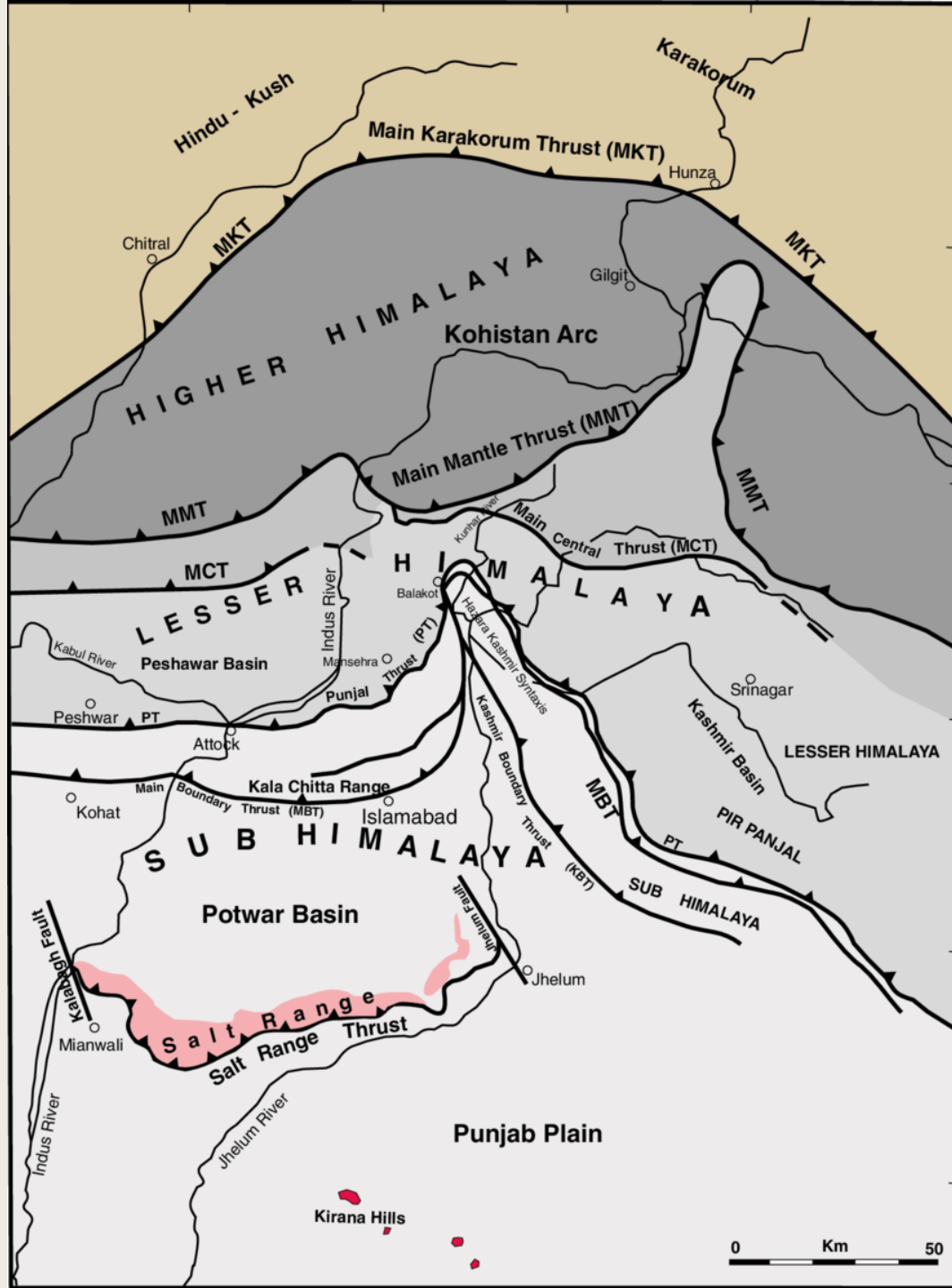




# NJHEP annual sediment inflow



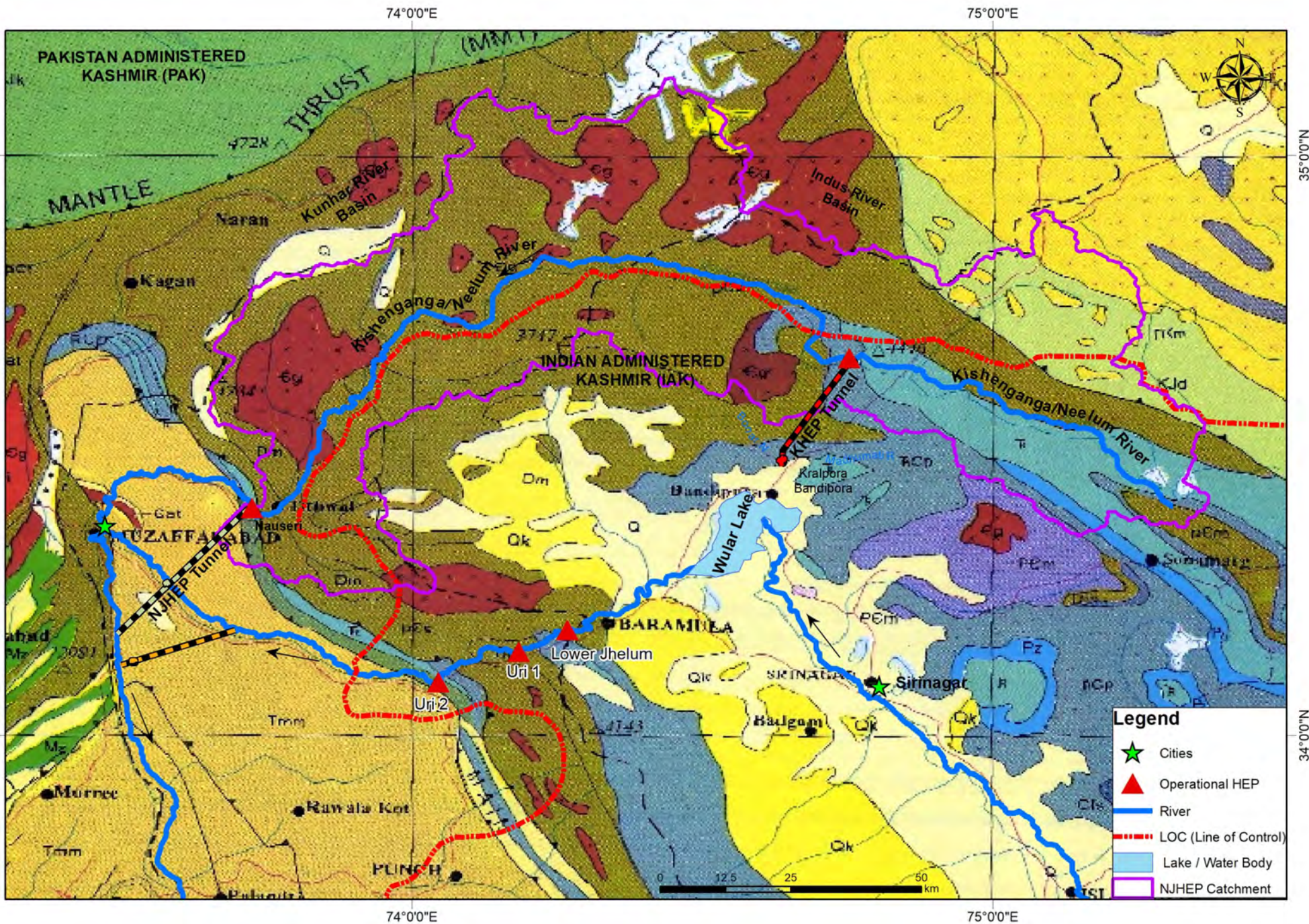
# Geology

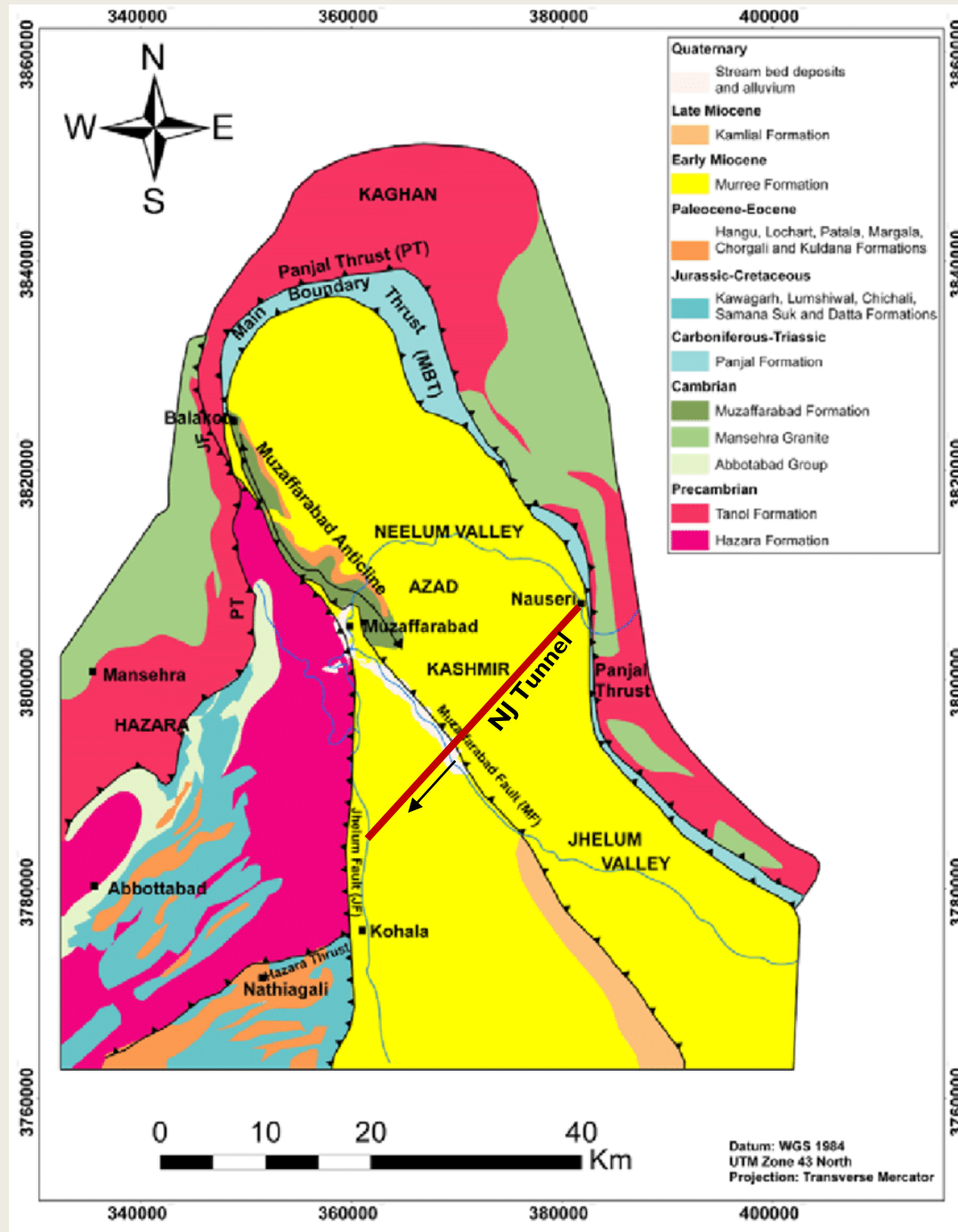


# Regional tectonic map



# Kashmir geology

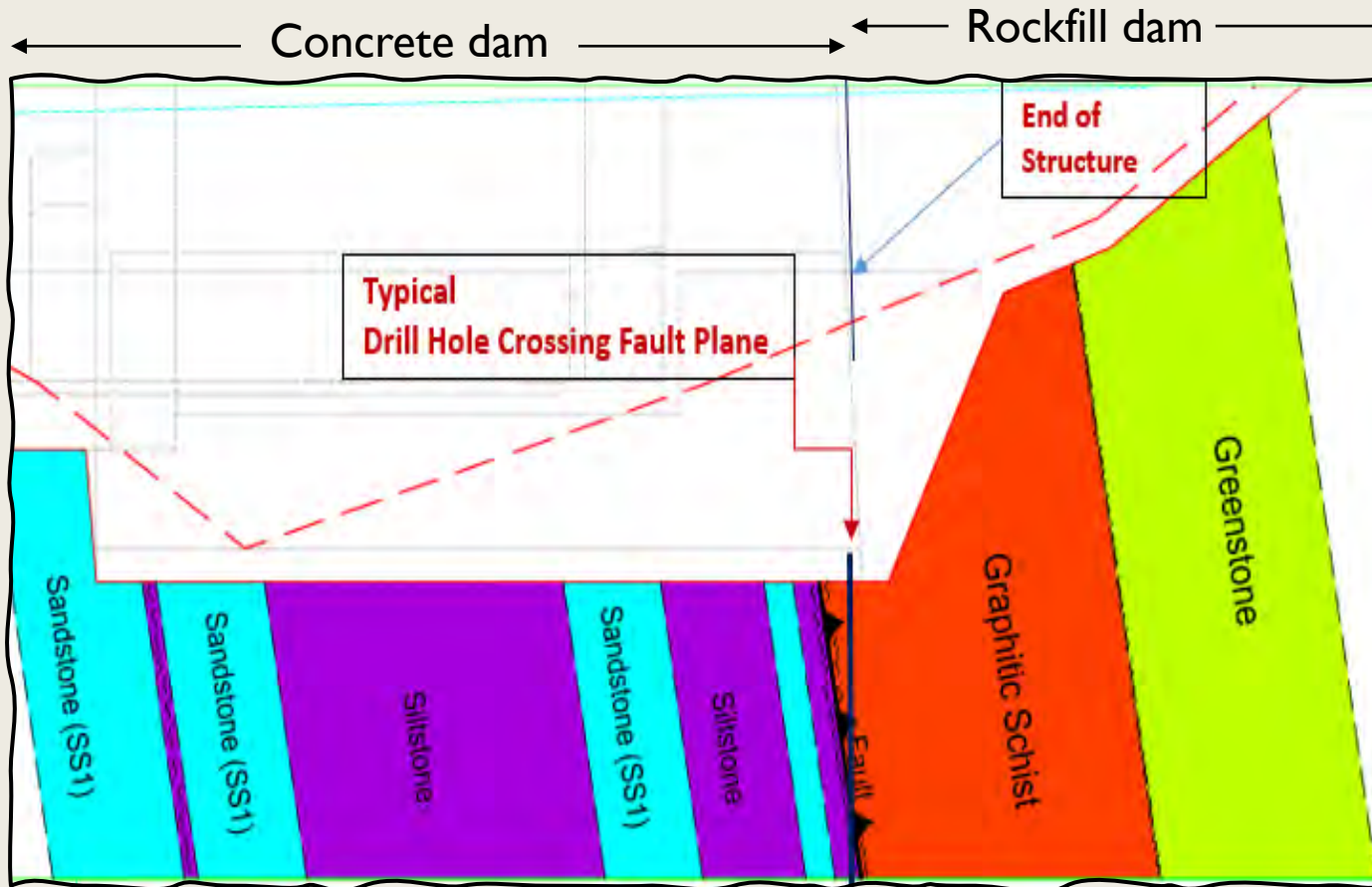




# Neelum Valley geology



# Geology at dam axis



- NJHEP sits on top of a fault – the **Main Boundary Thrust (MBT)** – between two different geological formations:
- The sedimentary rocks of the **Murree Formation**: sandstone, siltstone, shale.
- The metamorphic rocks of the **Panjal Formation**: meta basalts, greenstone, marble, quartzite and graphite schist.



Panjal Formation  
Greenstone, Graphite Schist Meta basalt  
Meta carbonates, Quartzite and Marble

MBT

Neelum River

Murree Formation  
Sandstone, Siltstone, Mudstone  
and Shale

**MBT  
contact**



MDBH-6  
Depth=25m

MDBH-5  
Depth=28.5m

MDBH-4  
Depth=25m

MBT

MBT

# MBT at dam





# Panjal versus Murree geology



Panjal Formation

Murree Formation

Sharp fault contact



