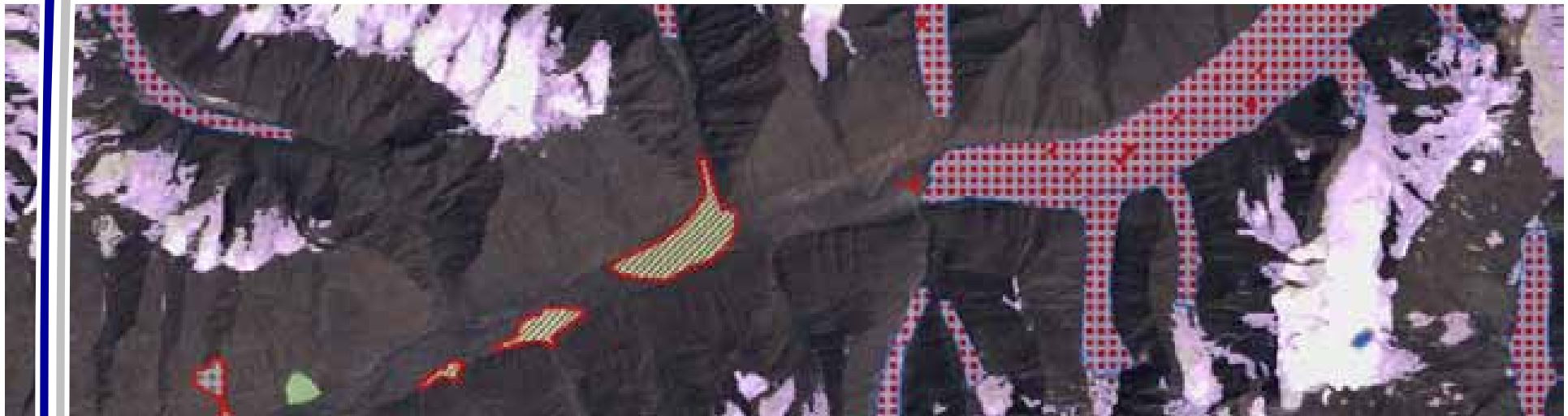




The Mountain Geohazard Assessment Model MoGAM

Presented by Ingrid Kleinbauer
*University of Natural Resources and Applied Life
Sciences, Vienna*



IAG

Mountain Geohazard Assessment Model



Content of the presentation

Hazard assessment at the regional scale

- > Data acquisition and preparation
- > Change detection
- > Survey planning

Direct survey of potential hazardous areas

- > Helicopter survey
- > Field work

Hazard assessment at the local scale

- > Model calculations
- > Hazard indication rating



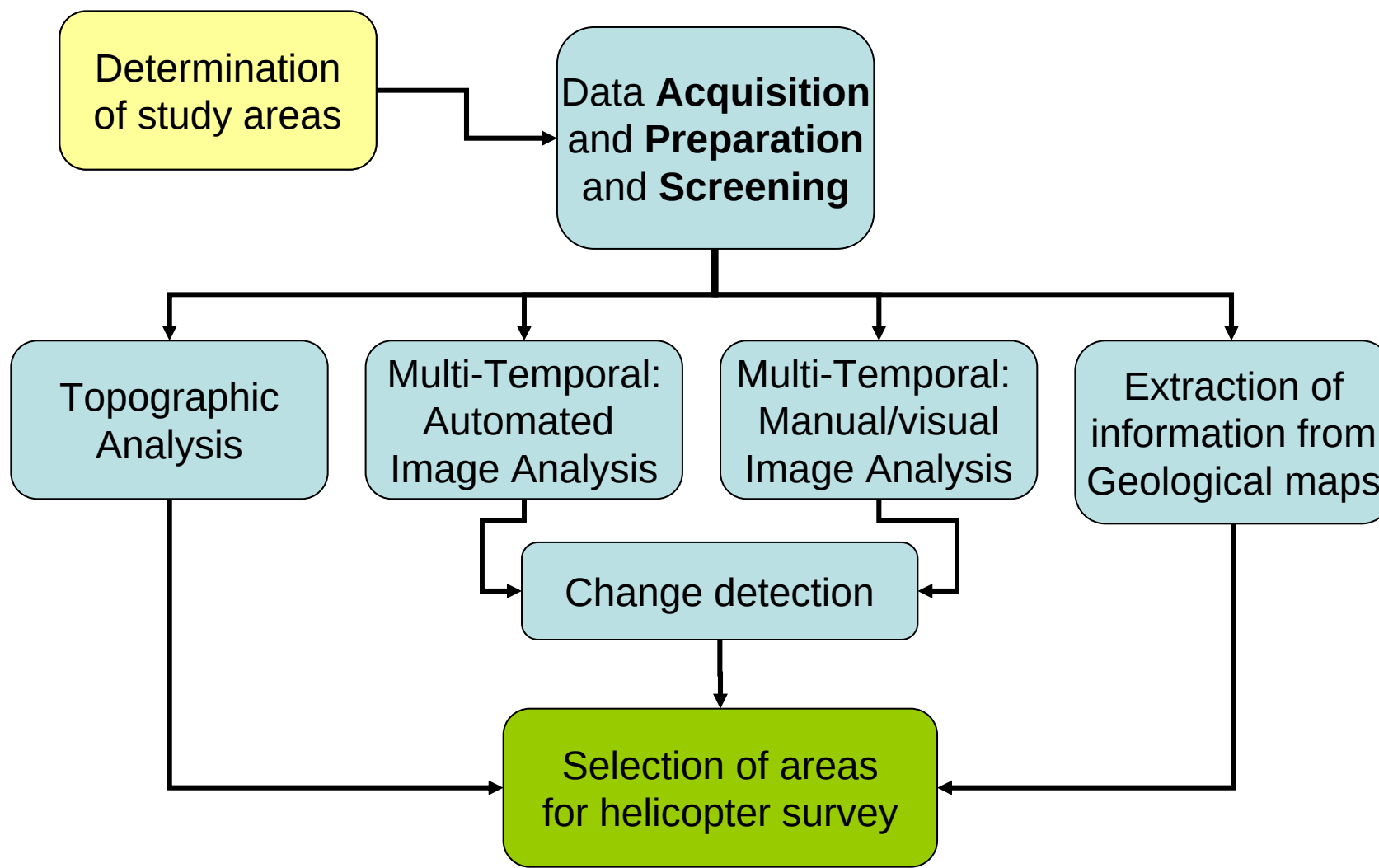
Mo  **GAM**

Mountain Geohazard Assessment Model

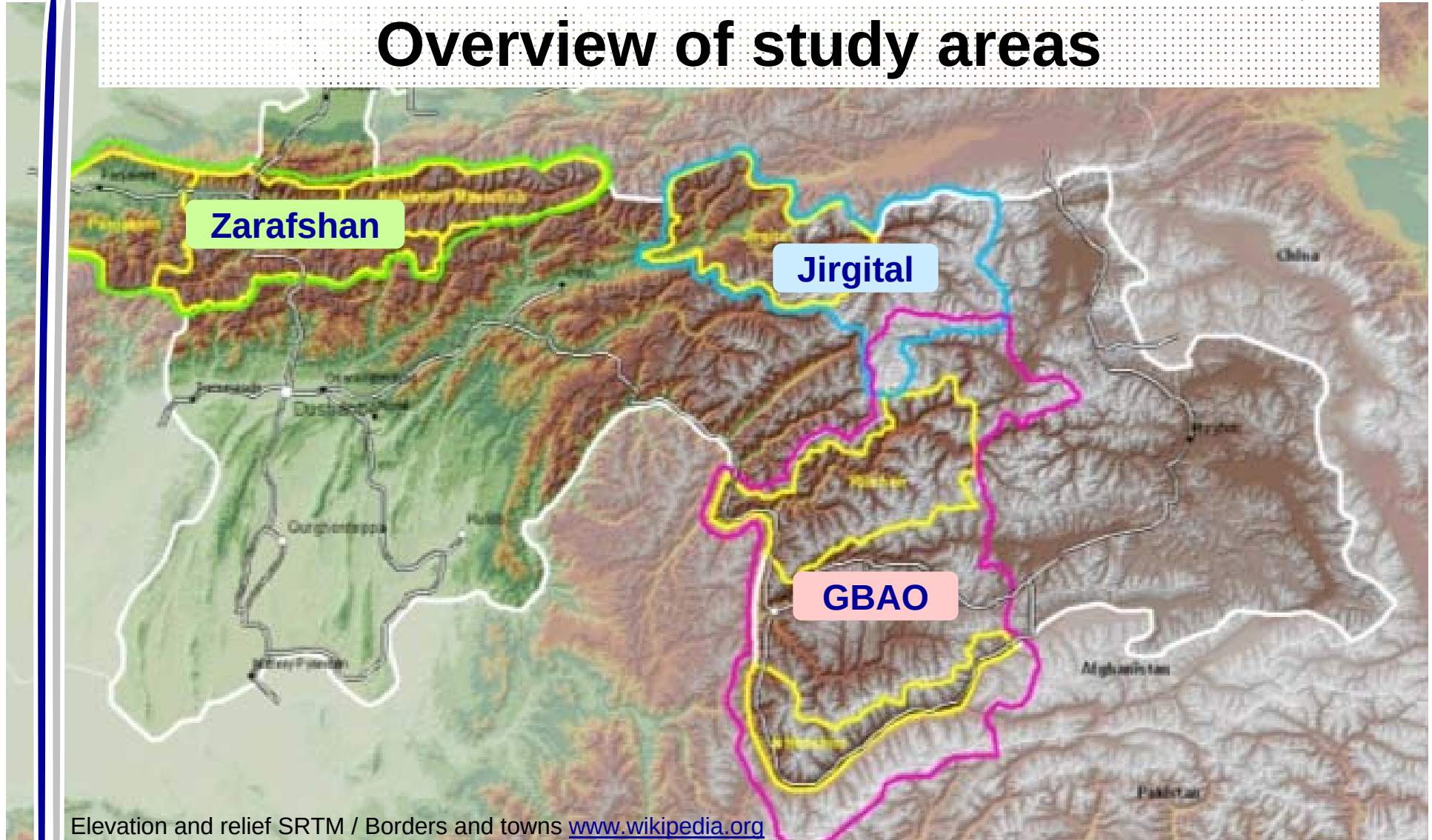
BOKU University, Vienna • FOCUS Humanitarian Assistance



Workflow



Overview of study areas



Satellite imagery – Time series

- > Scenes should cover each study area
- > Appropriate resolution (spectral and spatial)
- > Cloud cover should be as low as possible
- > Season/month when image is taken
- > Not to ignore: costs

Elevation data

- > Resolution (at least 60-90m)
- > Quality: no gaps in the data
- > Accuracy
- > Not to ignore: costs

Filled SRTM from <http://srtm.csi.cgiar.org/>

Sovjet Topographic maps: 1960-80

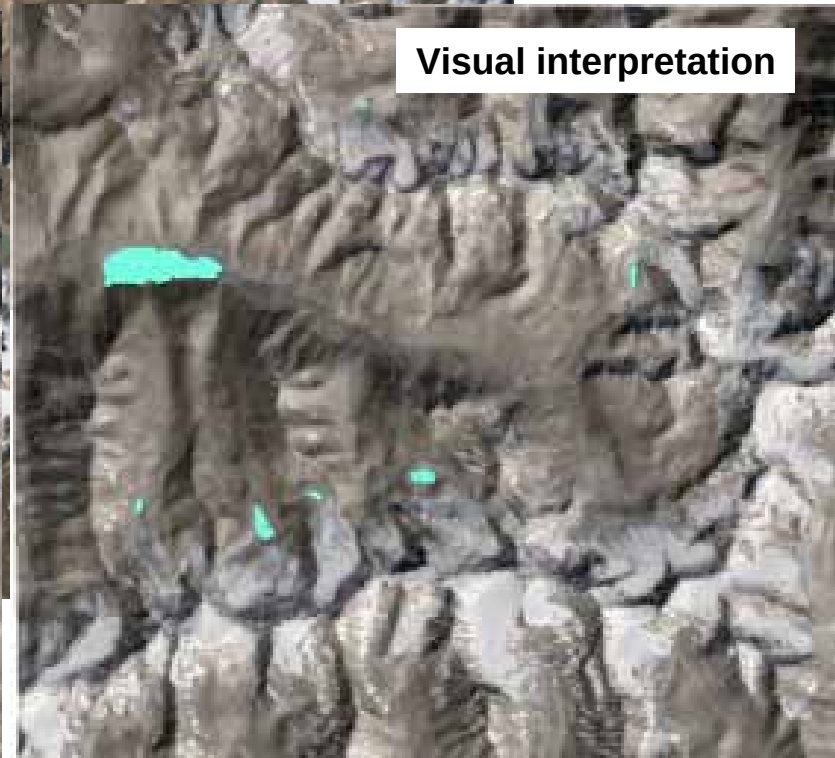
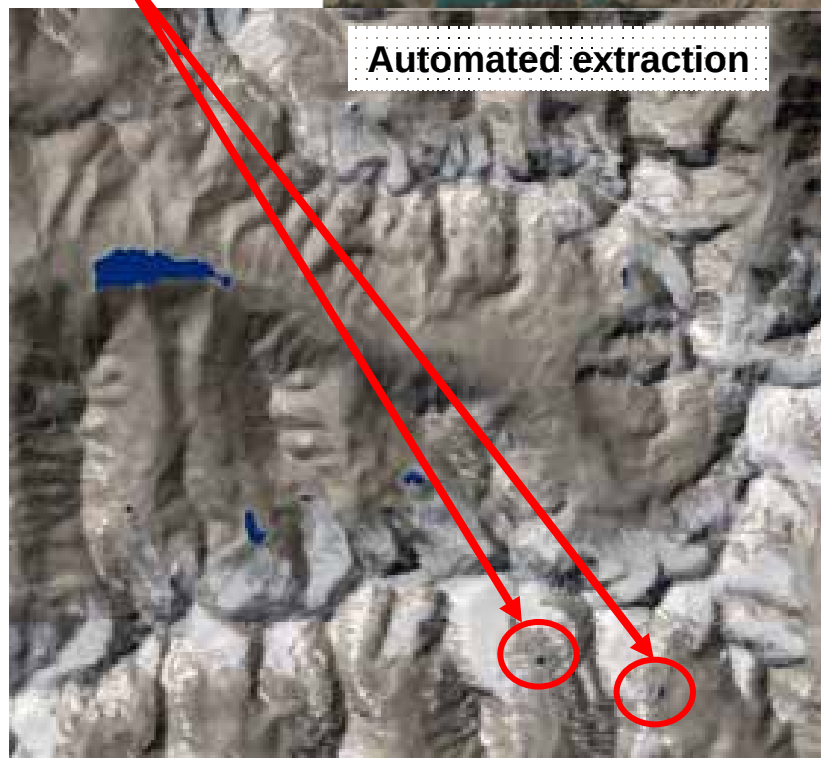
Georeferenced, mosaicked, and transformed example 1:100,000

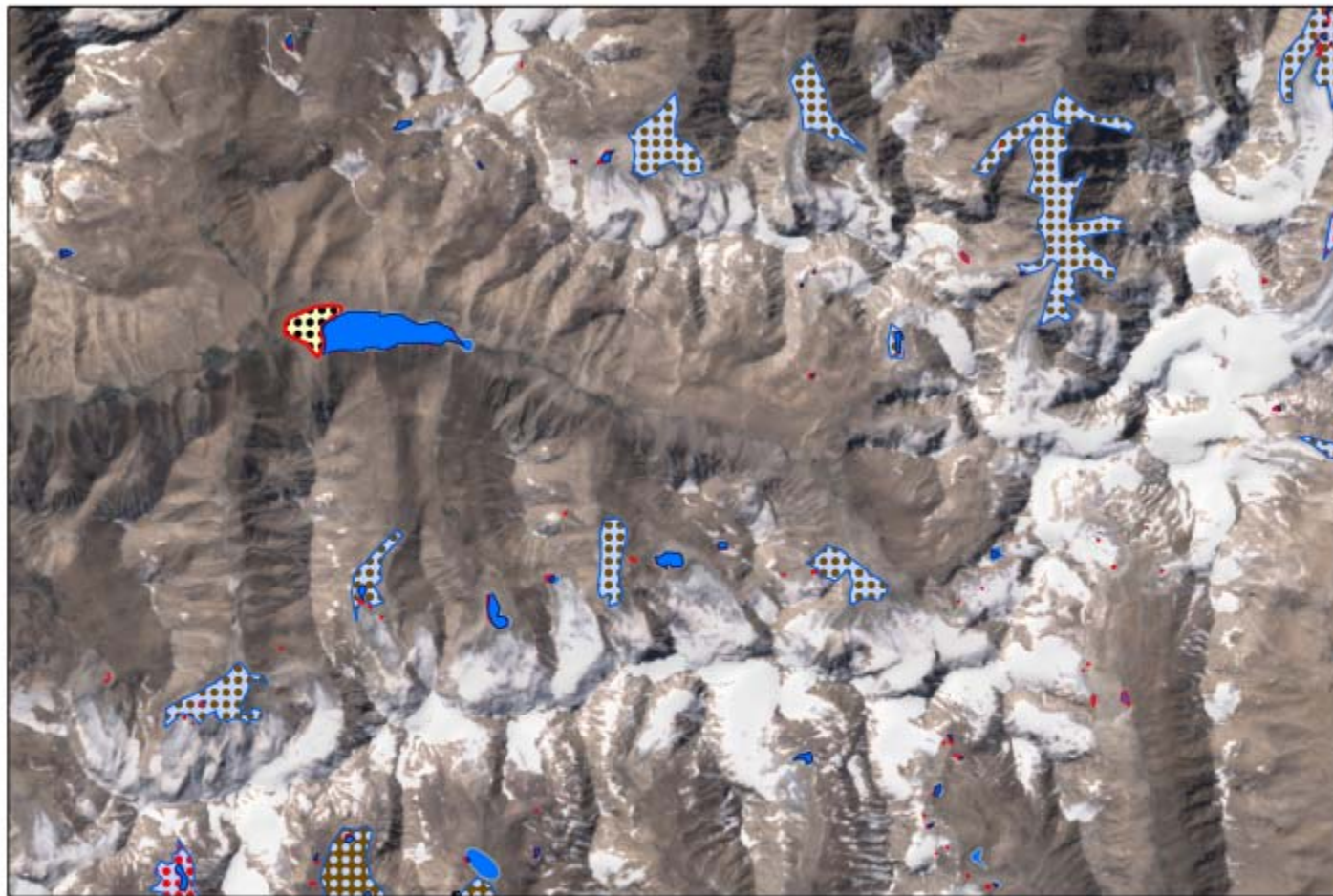


www.mapstor.com

Example Rivakkul

These
lakes do
not exist





Features of interest (polygons)

0 2.5 5 10 Kilometers

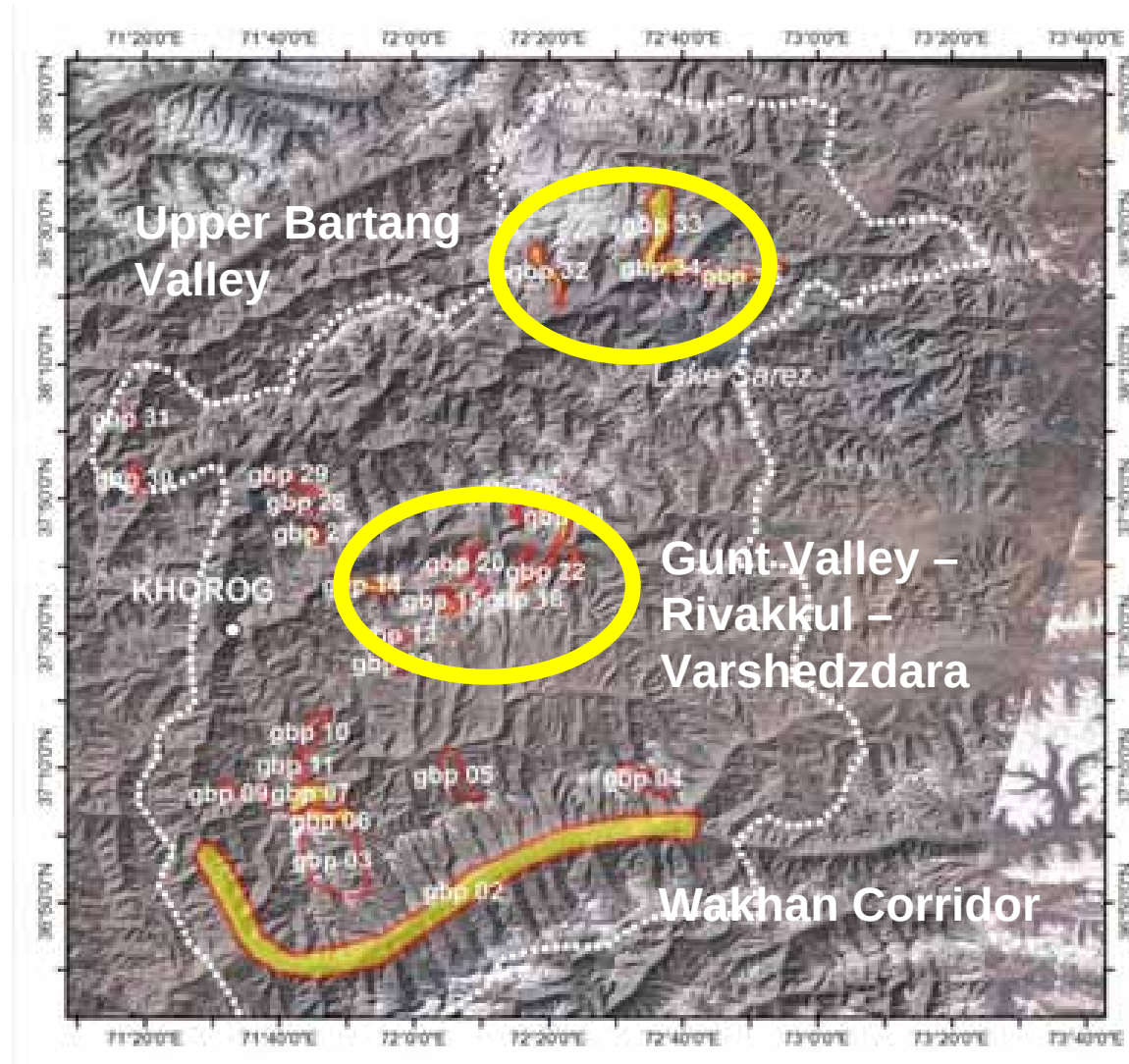
Lake 2000 and 2008	Thermokarst	Debris cone not cut by river
Lake 2000 only	Landslide scar	Debris cone cut by river
Lake 2008 only	Landslide deposit not cut by river	Large accumulation of debris, none of the above
Debris-covered glacier	Landslide deposit cut by river	Feature of interest, undifferentiated
Rock glacier	Debris cone undifferentiated	



Field work

- > Field trips lasting one to several days
- > by car or by helicopter drop off
- > Equipment: satellite telephone, field maps, GPS receiver, field computer, field book, camera, sample bags
- > Features of interest: slopes, dams, landslide deposits, valley bottom, (rock) glacier
- > Integration of new information and structured storage of data

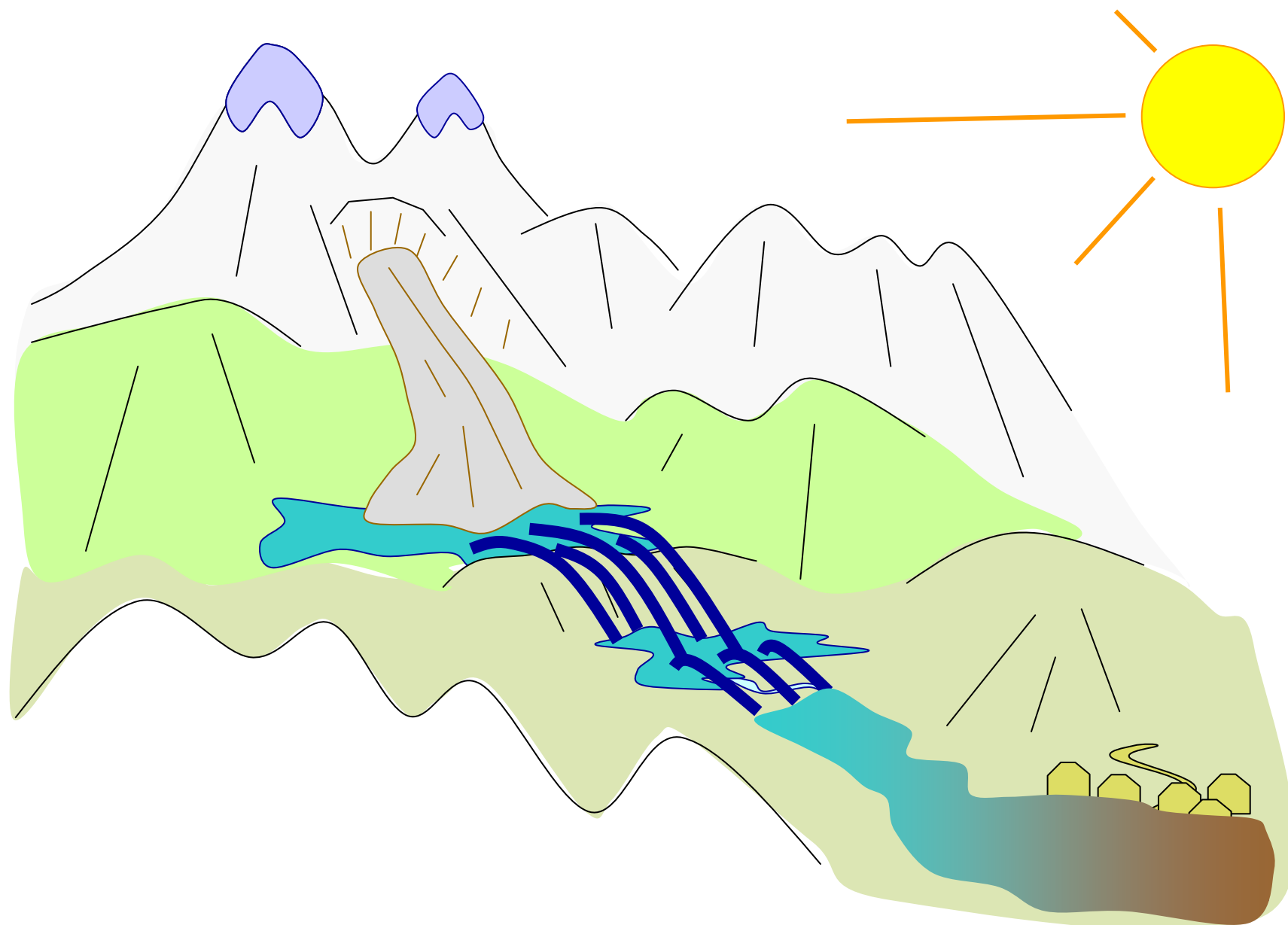
Field work



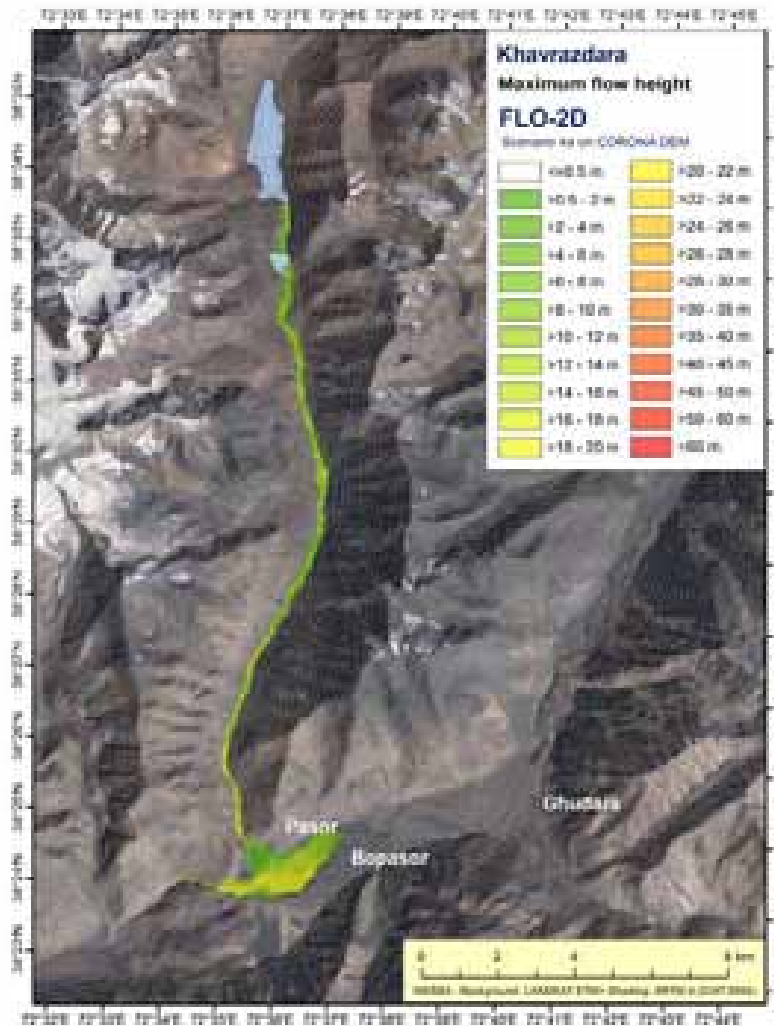


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Model calculations



FLO 2D and RAMMS



Post-Assessment – Hazard Rating

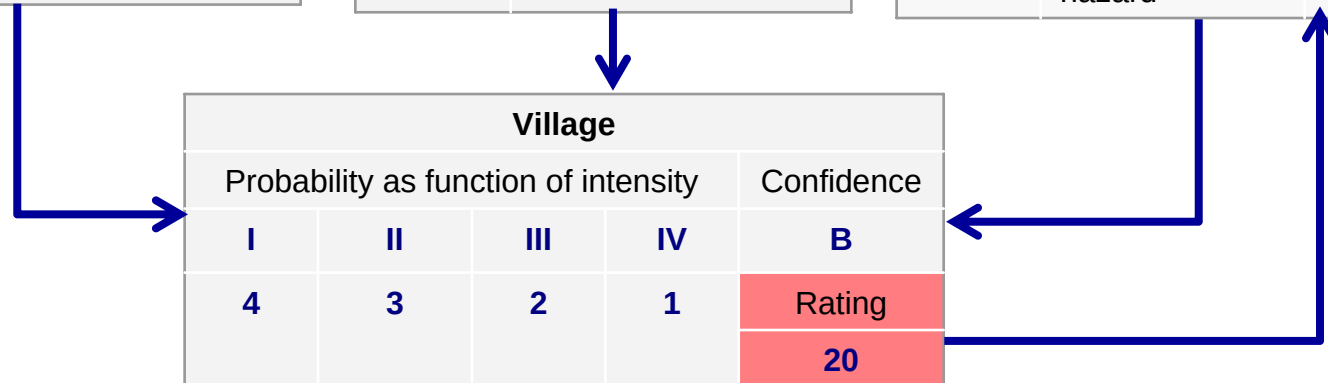
Intensity

Code	Class
I	Low intensity
II	Medium intensity
III	High intensity
IV	Very high intensity

Probability

Code	Class
0	Zero probability
1	Low probability
2	Medium probability
3	High probability
4	Very high probability

Code	Hazard indication rating	Range of s
6	Very high hazard	25 – 40
5	High hazard	20 – <25
4	Medium hazard	15 – <20
3	Moderate hazard	10 – <15
2	Low hazard	5 – <10
1	Very low hazard	0 – <5



Selected landscape features

-  Mass movement (starting area and deposit)
-  Composite or unclear deposit (mass movement/moraine)
-  Lake
-  Glacier
-  Former lake
-  Surging glacier
-  Glacier or rock glacier completely or partially blocking valley

Hazard indication rating for village or town

-  1 - Very low hazard
-  2 - Low hazard
-  3 - Moderate hazard
-  4 - Medium hazard
-  5 - High hazard
-  6 - Very high hazard

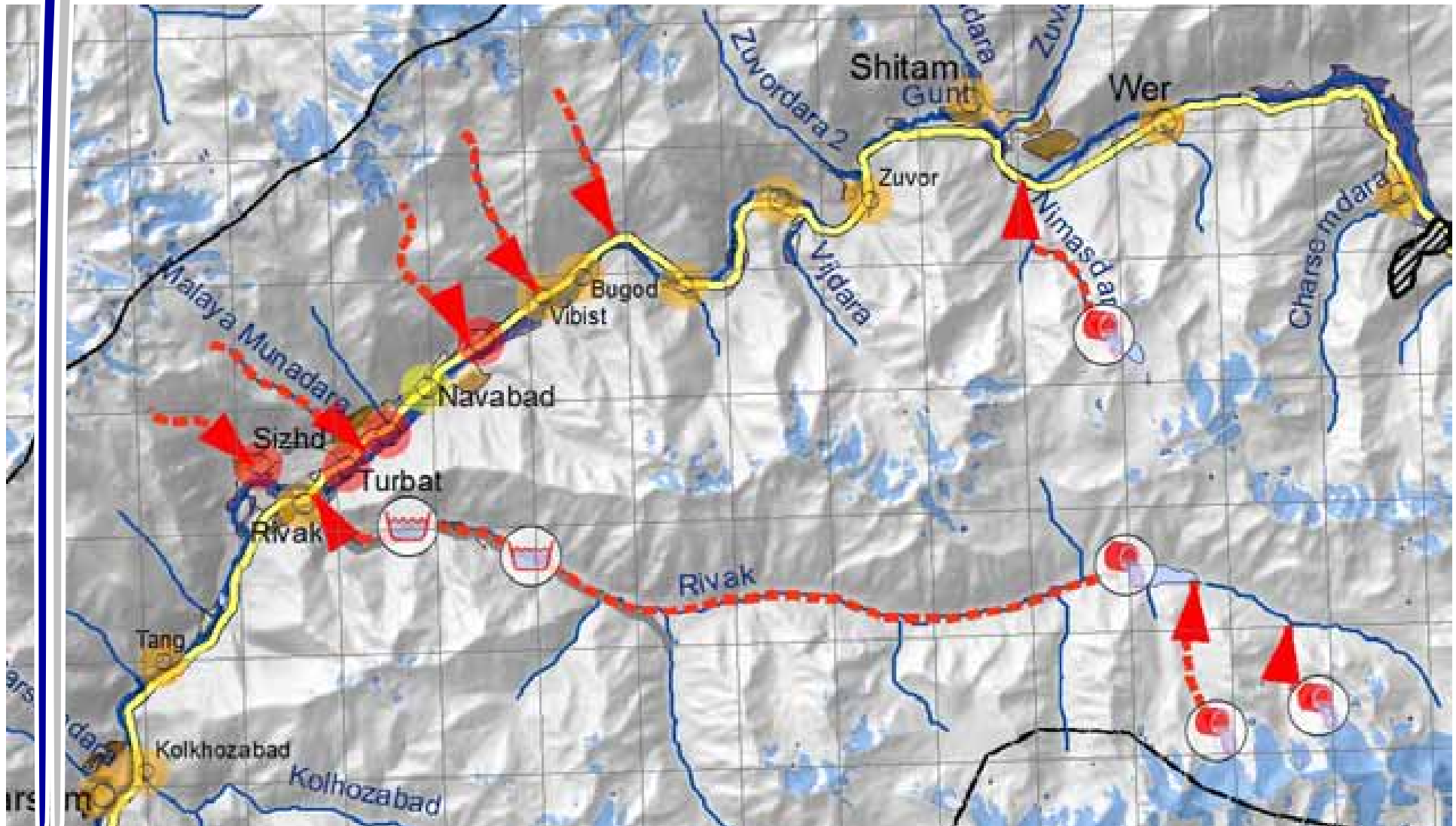
Selected geohazards

-  Landslide or related hazard
-  Lake outburst hazard
-  Ice fall or ice avalanche hazard
-  Pathway of potential mass flow (selection of most critical valleys; flows of debris or mud are possible almost everywhere)

Elevation of cultivated areas above valley bottom

- | | |
|--|---|
|  <=5 m |  >50 - 100 m |
|  >5 - 10 m |  >100 - 200 m |
|  >10 - 20 m |  >200 m |
|  >20 - 50 m | or horizontal distance to river >500 m (tributaries only) |

Hazard Indication Map



Thanks for your attention!

Discussion

