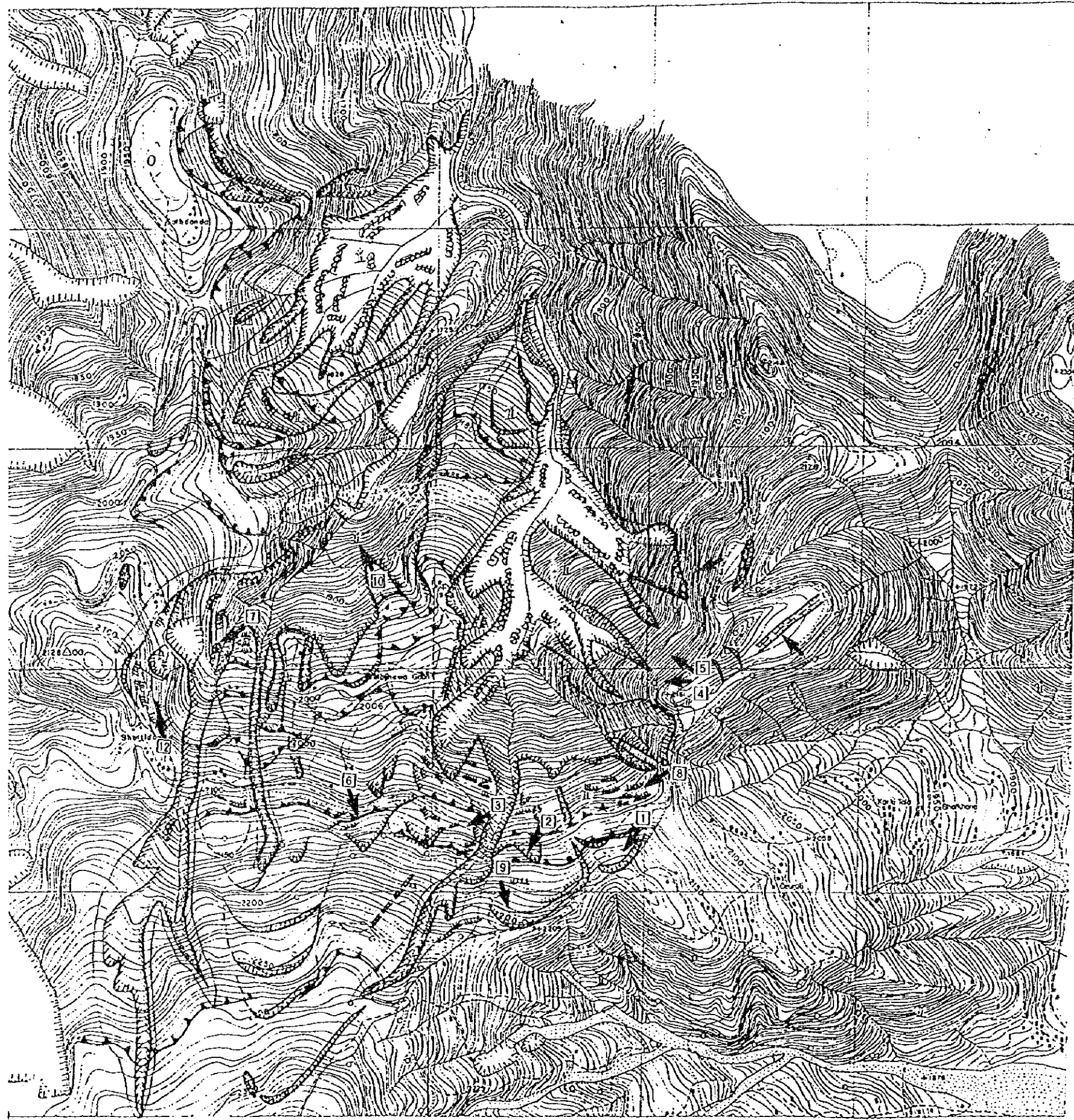


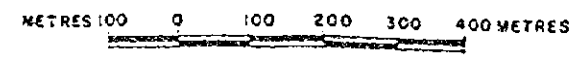
Photographs
-Chisapani-



LEGEND

- Landslide due to the 1993 Disaster
- Head Scrap and Landslide Configuration
- Crack
- Rock Exposure
- Cavity
- Gully Erosion
- Subdivided Area
- Location and Direction of Longitudinal Profile
- Knick Line

Photograph Location Map -Chisapani-



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Photo-1 Landslide due to 1993 Disaster.

The slided rocks in form of broken rock layers shows the characteristic of "plane slide".

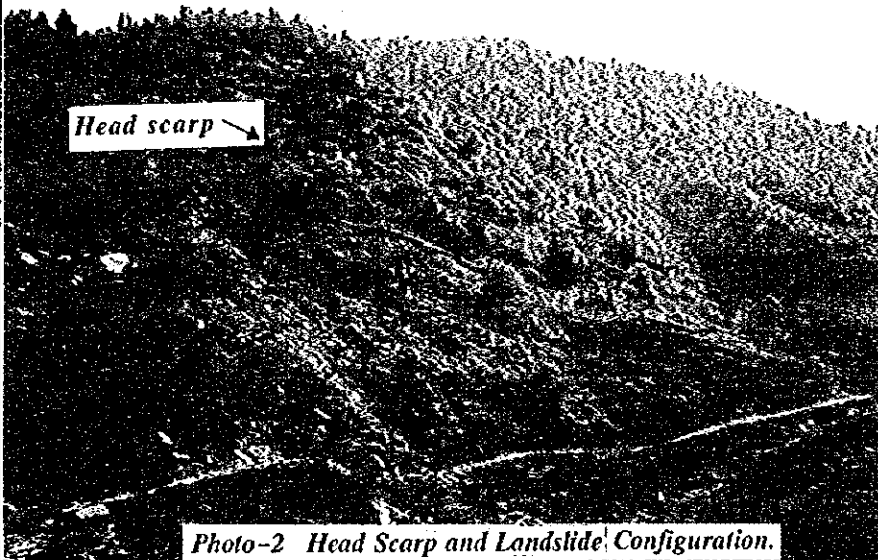


Photo-2 Head Scarp and Landslide Configuration.

The head scarp of landslide are observed between the vegetation steps.

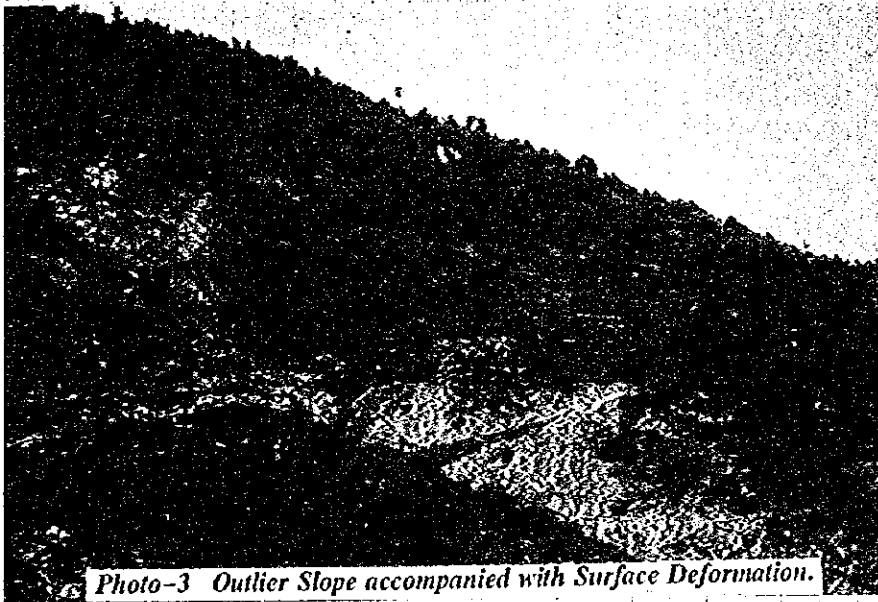


Photo-3 Outlier Slope accompanied with Surface Deformation.

The unstable slopes with many cracks exist on the upper side of foot pass.

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Kailash danda

Thin danda

Photo-4 A Panorama of Chisapani as seen from East side.

Kailash Danda is the center hill, and the right hill is Thin Danda. The almost are unstable slopes except on the hills.

Kailash danda

Thin danda

Photo-5 A Panorama of Chisapani as seen from East side.

Enlarged photos of Kailash Danda and Thin Danda. The side slopes ruins of the valley is remarkable.

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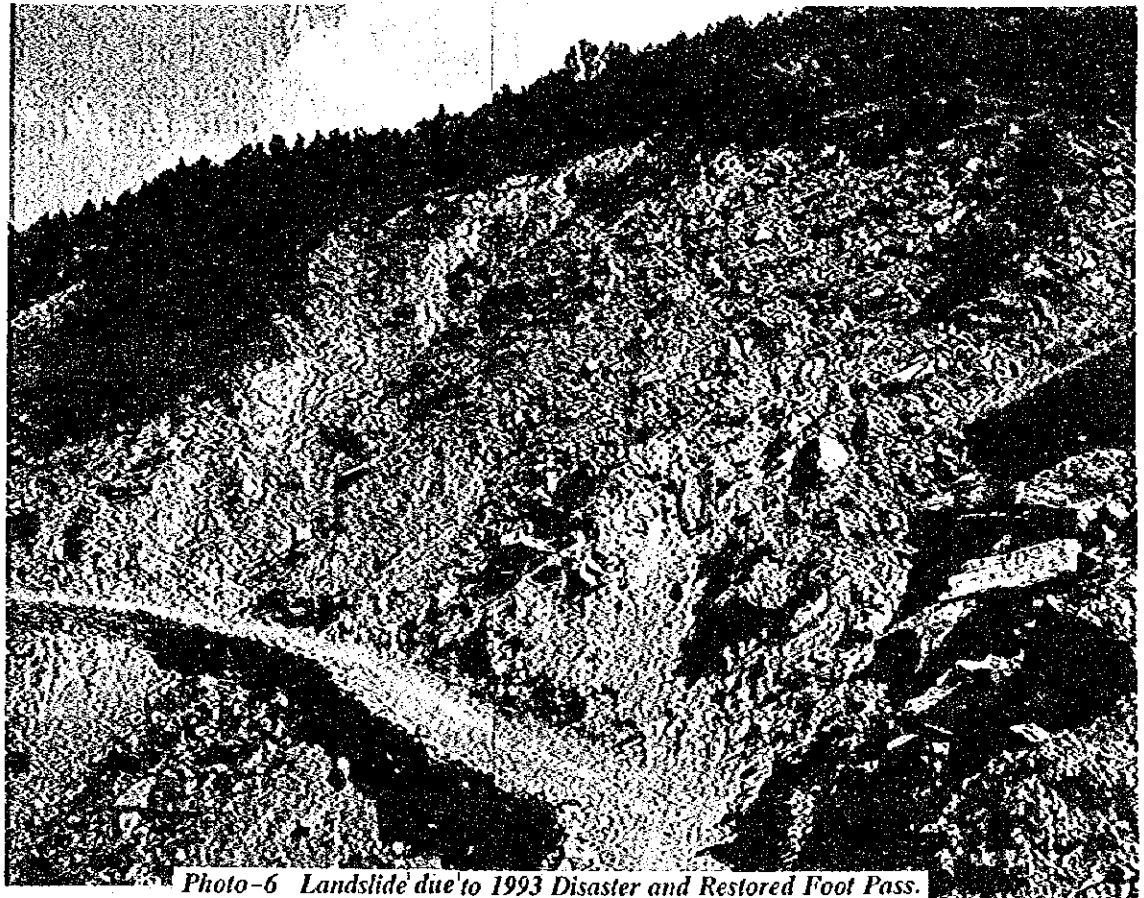


Photo-6 *Landslide due to 1993 Disaster and Restored Foot Pass.*

Landslide along the foot pass. The top soil on the slope is very thin, the average is less than 1 m thick. the landslide was about 2-3 m thick. The damaged road is now tentatively rehabilitated.



Photo-7 *Large Scale Landslide and Gully Erosion.*

Landslide occurred under the Kailash Danda. On the landslide slopes, the base rocks are almost exposed.

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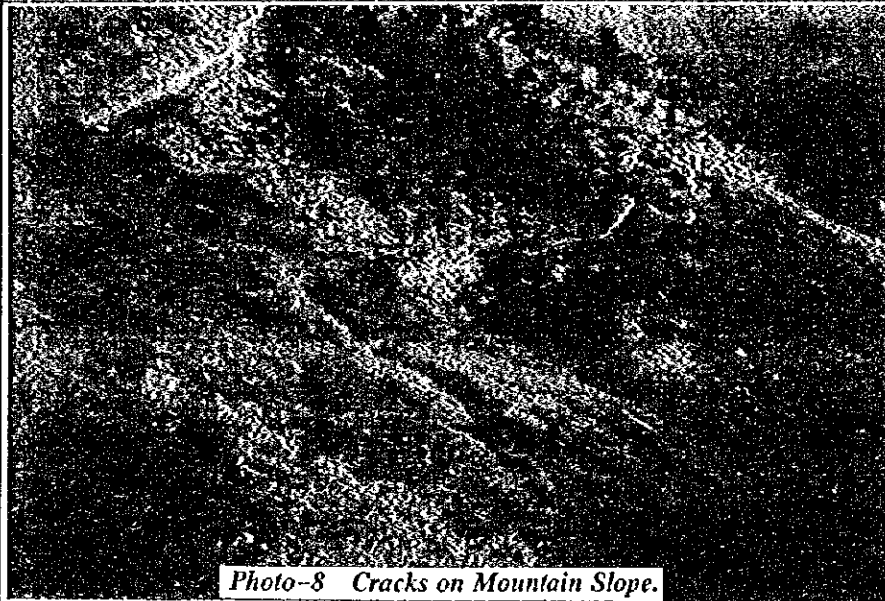


Photo-8 Cracks on Mountain Slope.

The width of cracks is about 0.3 m, it occurred continuously from up to down.

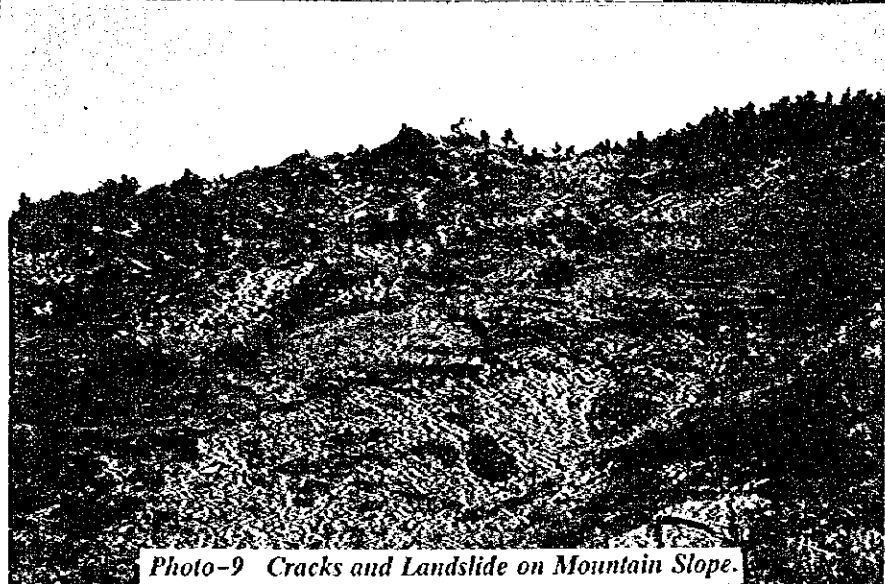


Photo-9 Cracks and Landslide on Mountain Slope.

The slopes at the upper side of landslide is unstable with developed steps and cracks and very dangerous to collapse.

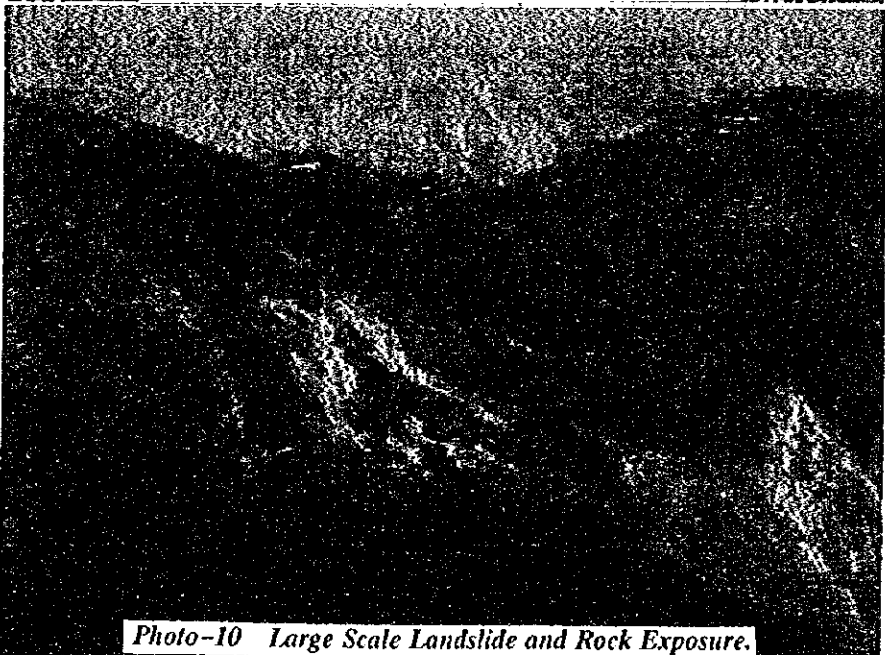


Photo-10 Large Scale Landslide and Rock Exposure.

Landslide occurred between Kailash Danda and Thin Danda on the west slope. Many landslides are observed under the knick line.

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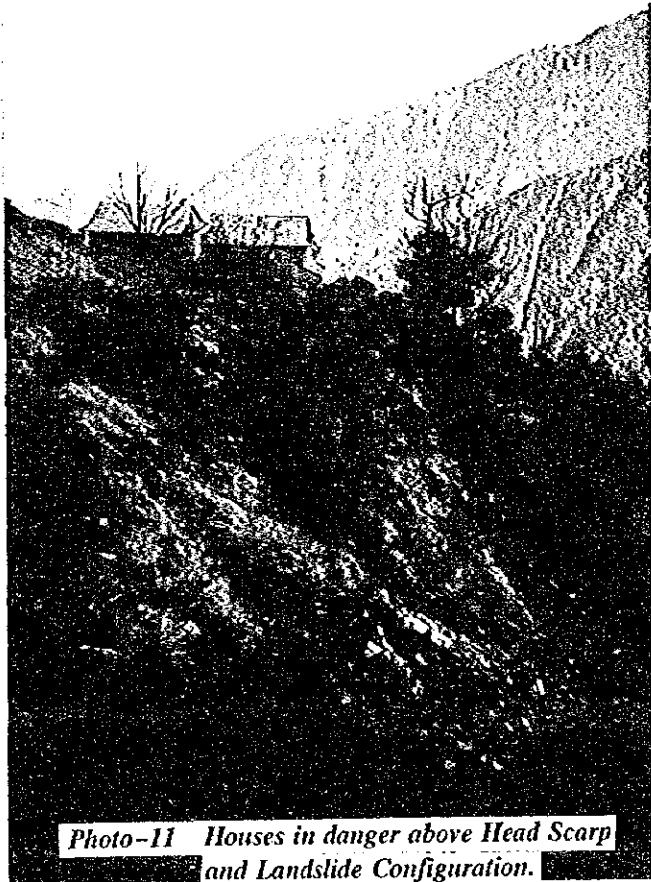


Photo-11 Houses in danger above Head Scarp and Landslide Configuration.

Many houses are found on such a top of scarp in Chisapani.

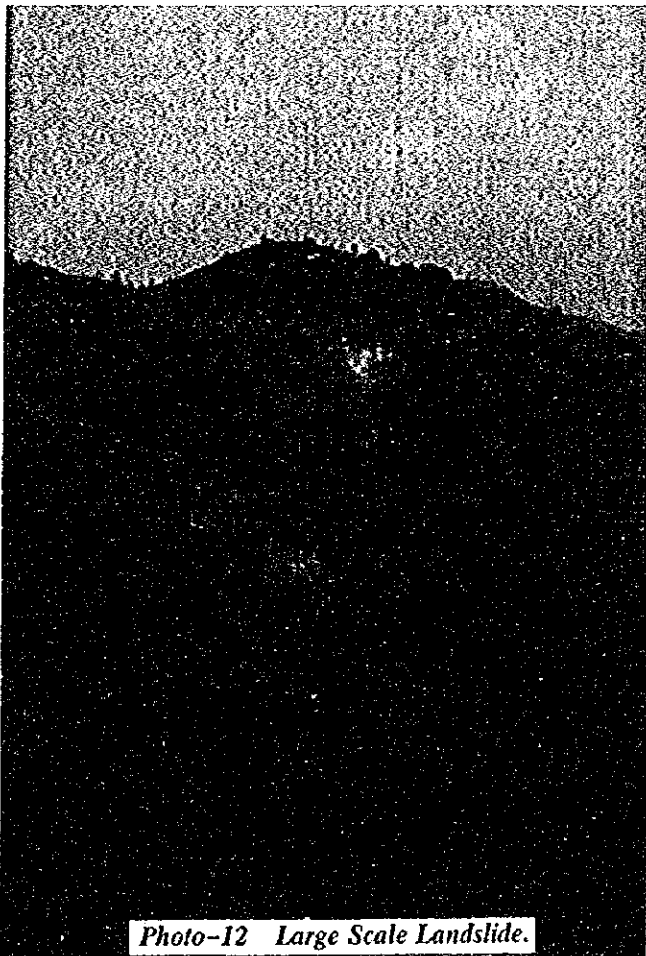


Photo-12 Large Scale Landslide.

The panorama view of landslides occurred under Kailash Danda.

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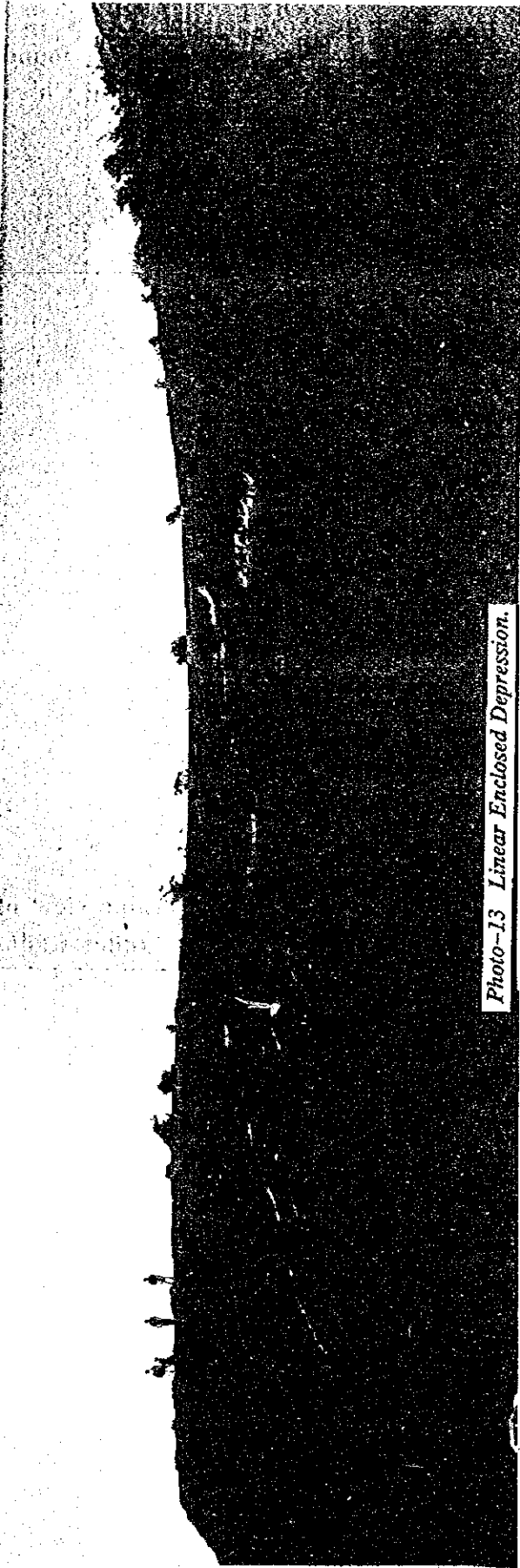


Photo-13 Linear Enclosed Depression.

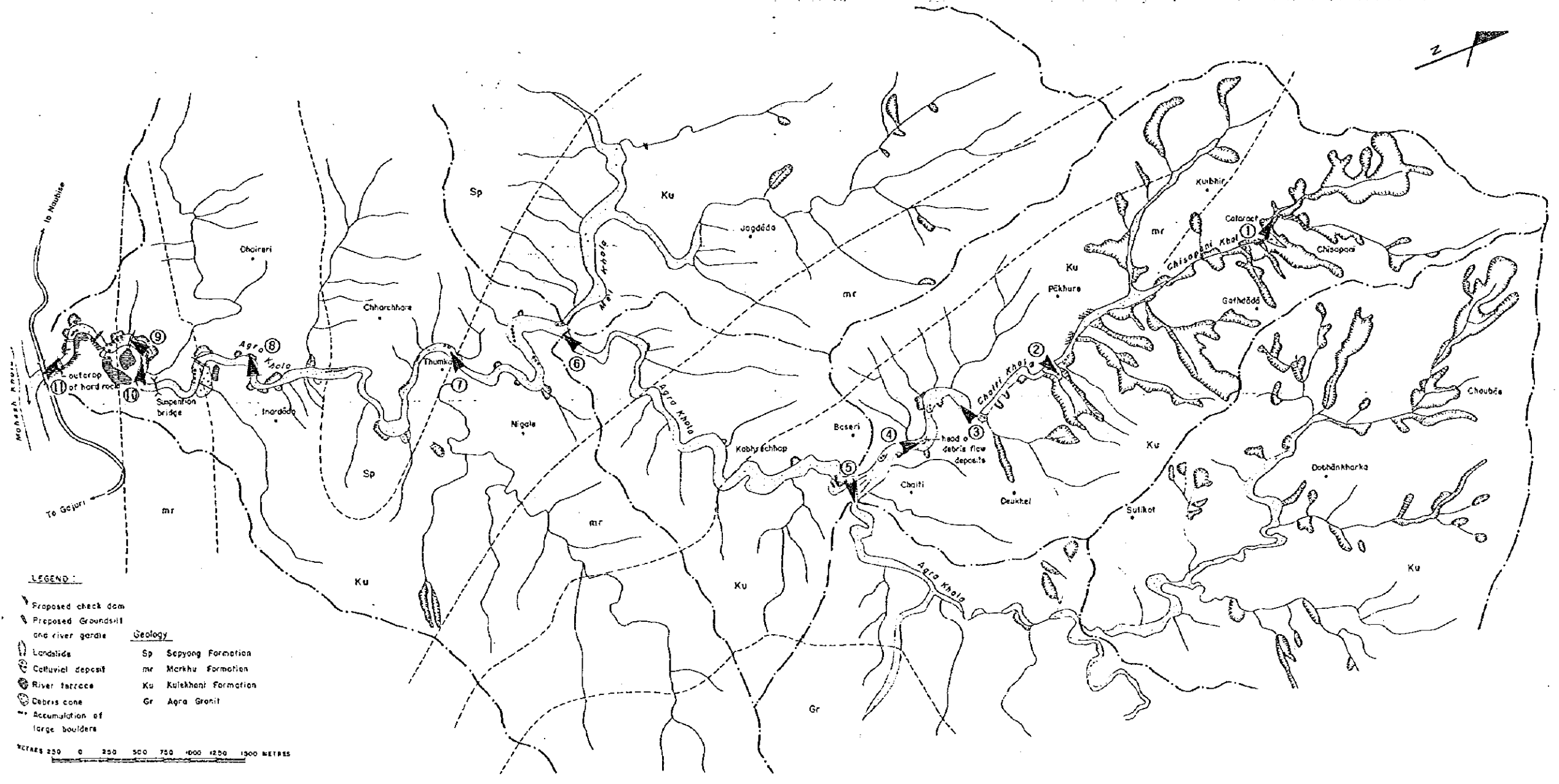
The linear enclosed depression on the eastern hill, is covered with grasses for the pasturage of sheep. This side is the center of depression with some cracks on the edges.

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Photographs
-Agra Khola-



LEGEND:

- Proposed check dam
- Proposed Groundsill and river garde
- Landslide
- Colluvial deposit
- River terrace
- Debris cone
- Accumulation of large boulders

Geology

- Sp Sopyong Formation
- mr Merku Formation
- Ku Kulekhani Formation
- Gr Agra Granit

METRES 250 0 250 500 750 1000 1250 1500 METRES

Photograph Location Map -Agra Khola-

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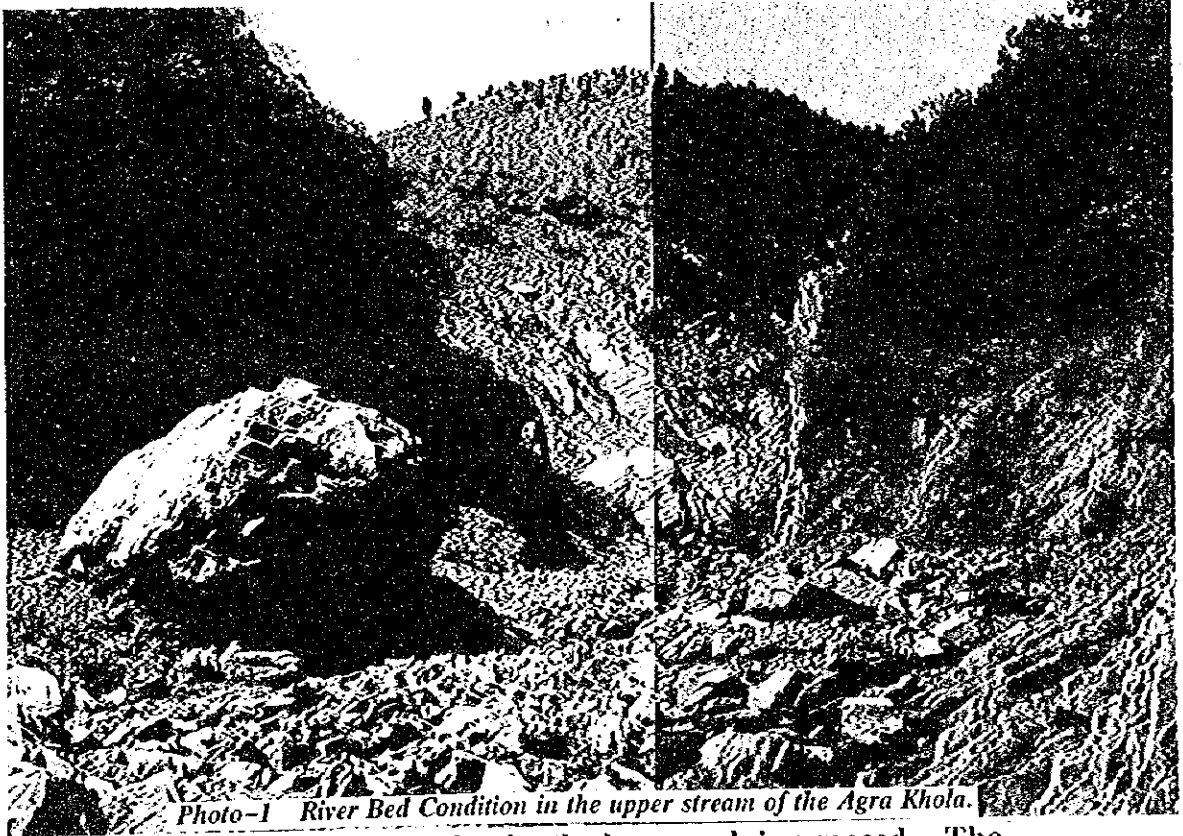


Photo-1 River Bed Condition in the upper stream of the Agra Khola.

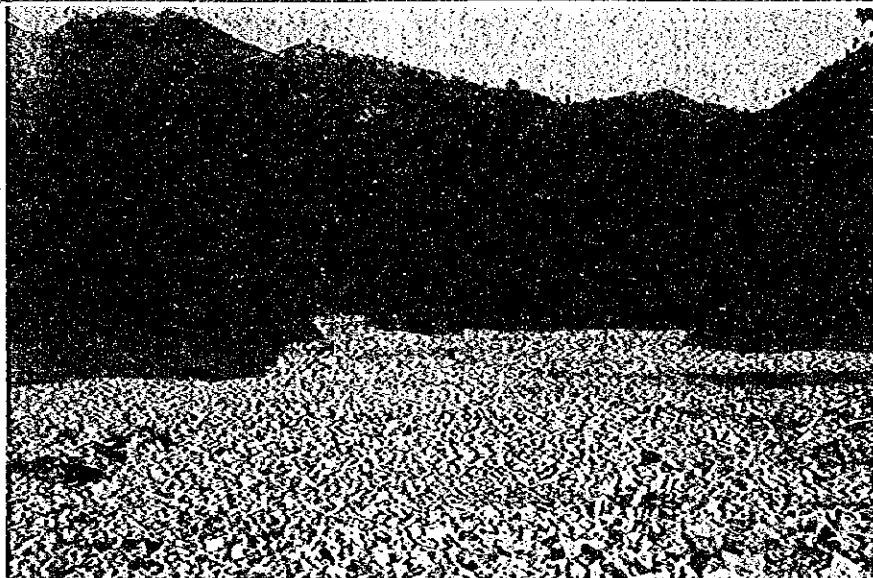
Along the river bank, the base rock is exposed. The sediment on the riverbed is comparatively thin.



Photo-2 Severe Colluvium Deposit due to Large Collapse.

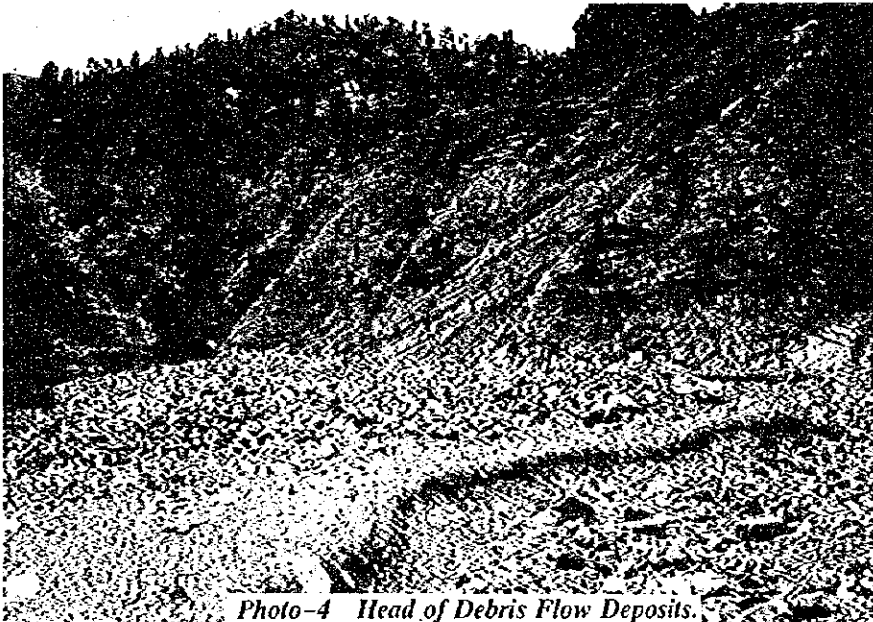
In the underground of landslide, the small gravels are thickly accumulated.

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The valley was buried with debris and the river width was expanded. The riverbed surface is flat.

Photo-3 Gravel filled River floor in the middle stream of the Agra Khola.



The head of debris fan. Such geographical features are often observed.

Photo-4 Head of Debris Flow Deposits.

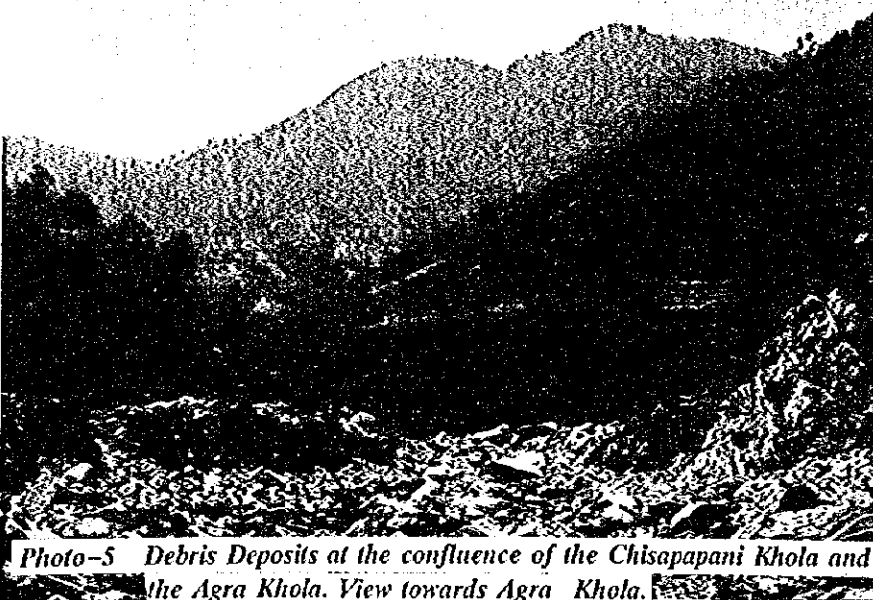


Photo-5 Debris Deposits at the confluence of the Chisapapani Khola and the Agra Khola. View towards Agra Khola.

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Photo-6 River Bed Condition at the confluence of the Mel Khola and the Agra Khola. View towards the upstream.

The right side is the Mel Khola, the debris colored brown were flown.

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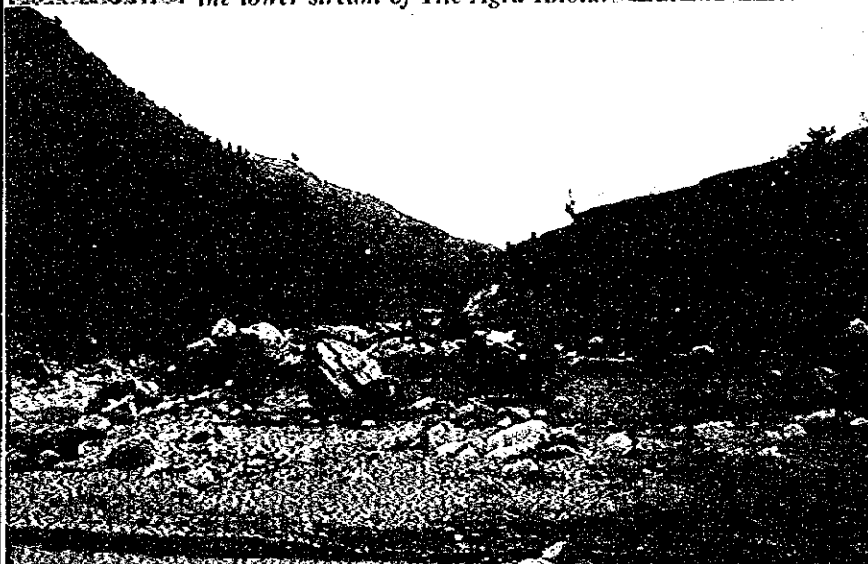
The river course remarkably meander, the boulders are accumulated in the right bank.

Photo-7 River Bed Condition in the lower stream of the Agra Khola. View towards the downstream.



This is the source of debris to downstream.

Photo-8 Severe River Bank Failure and these Colluvium Deposits in the lower stream of The Agra Khola.



This is the source of large boulders to downstream.

Photo-9 Terrace Gravel Deposits in the lower stream of the Agra Khola.

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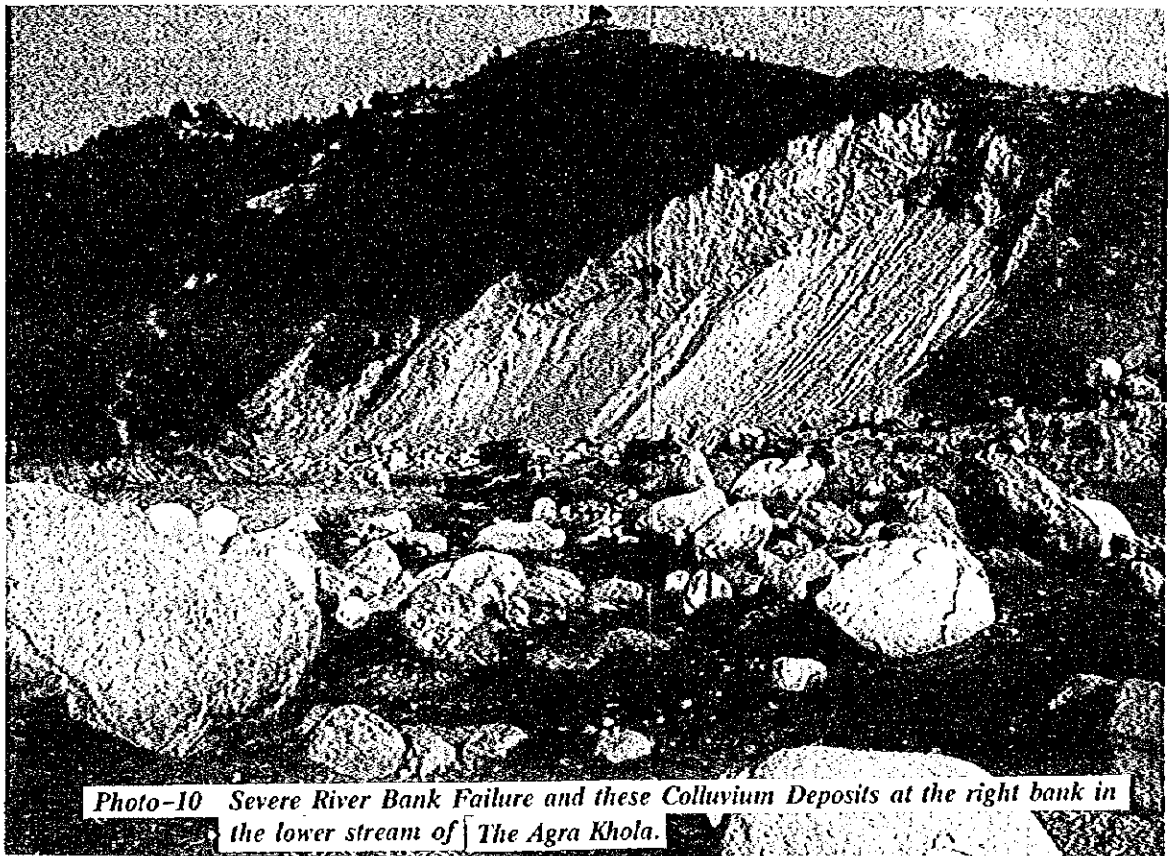


Photo-10 Severe River Bank Failure and these Colluvium Deposits at the right bank in the lower stream of The Agra Khola.

The failure debris and big boulders on the riverbed flow to around Mahadevbesi Bridge.



Photo-11 An Old Mahadev Besi Bridge. A New Mahadev Besi Bridge is in constructing now towards the downstream.

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Photographs
-Kulekhani-

Photo-1 Penstock Bridge



Before the flood of July 1993 (May 24, 1992)

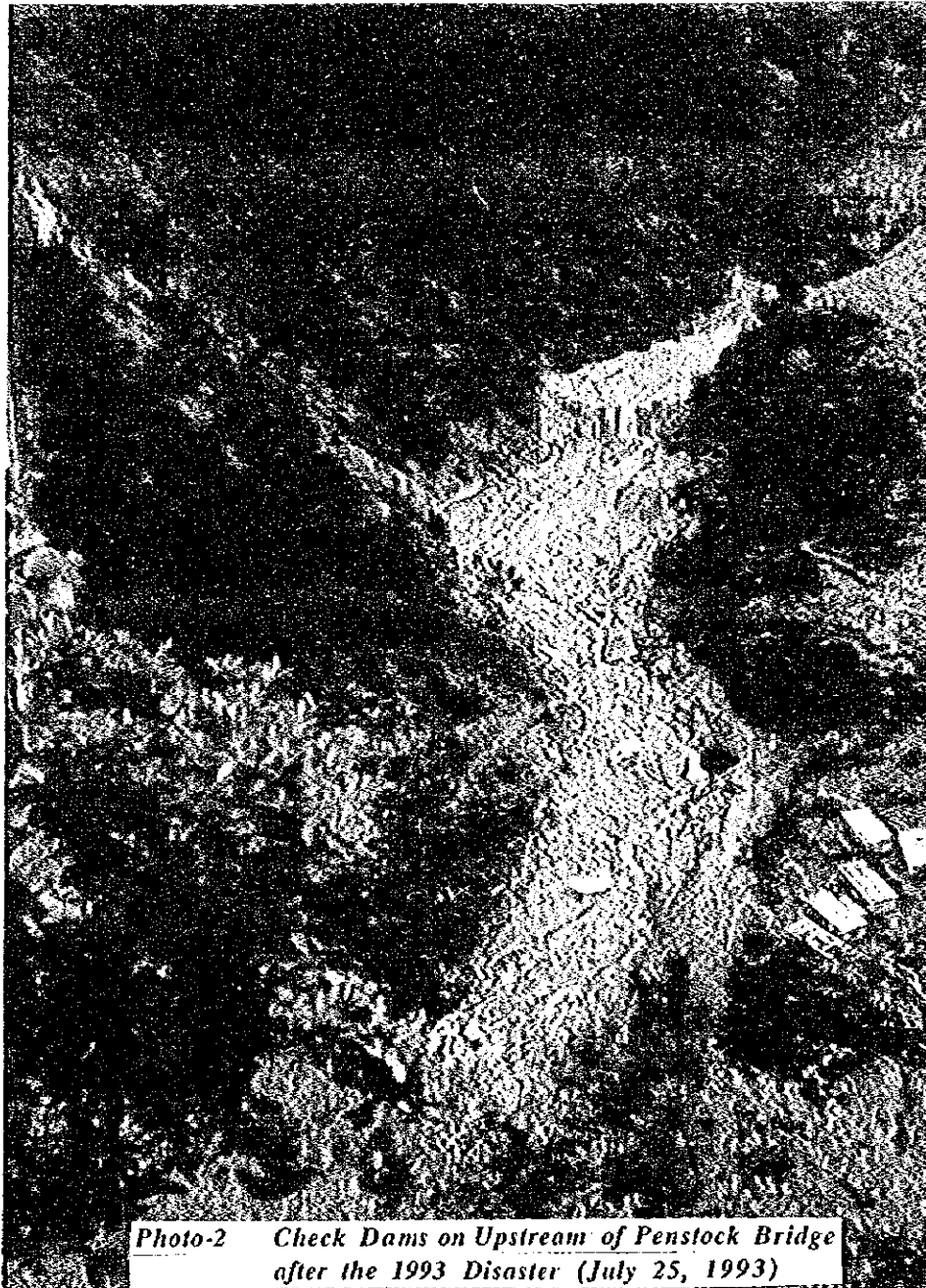
Viewed from upstream to downstream



After the flood (July 24, 1993)

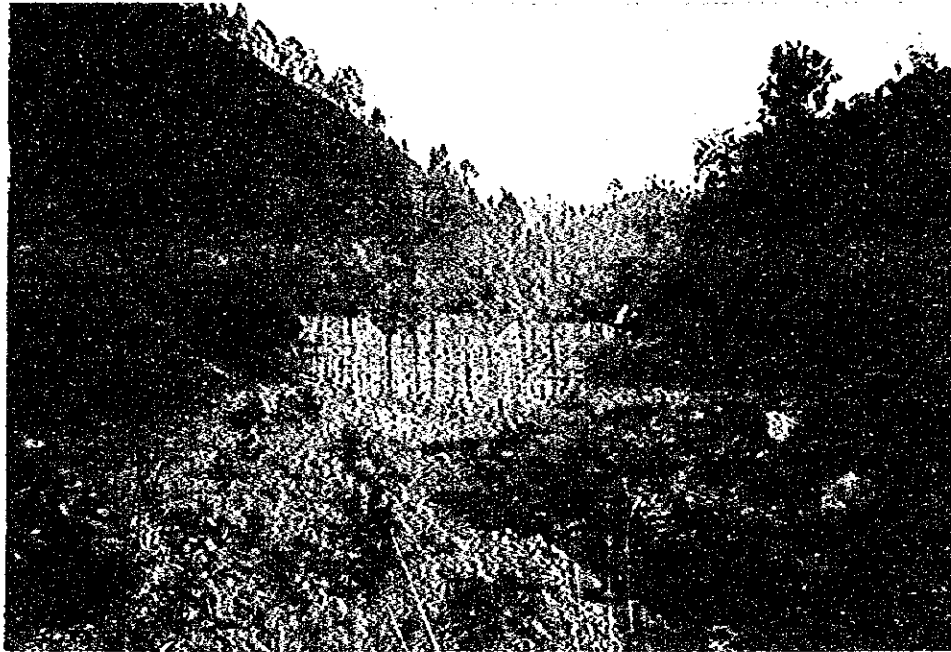
Viewed from upstream to downstream

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*Photo-2 Check Dams on Upstream of Penstock Bridge
after the 1993 Disaster (July 25, 1993)*

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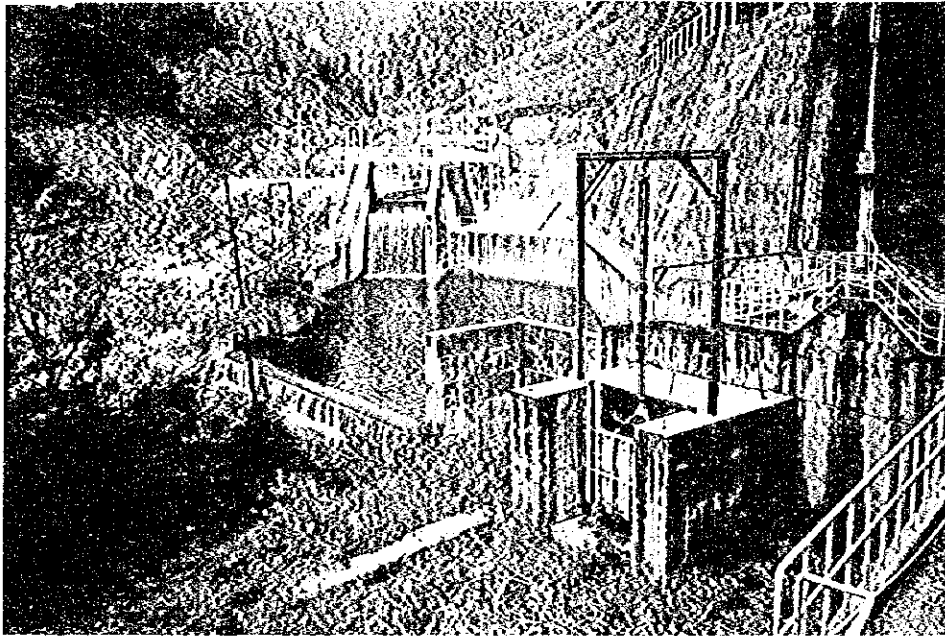
**Mar. 24, '92 Before the flood of July 1993
Sedimentation was trapped upto second low of drain hole**



**Aug. 28, '93 After the flood of July 1993
Wing wall was severely damaged by boulders
Check dam was completely filled by sedimentation**

Photo-3 Check Dam J-1

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**Apr. 29, '93 Before the flood of July 1993
Viewed from downstream to upstream
Water spilled out from spillway of headpond
The flow of Mandu river was taken to headpond**



**Aug. 28, '93 After the flood of July 1993
Viewed from downstream to upstream
Headpond and Tailrace outlet were completely buried by debris flow**

*Photo-4
Mandu Headpond and Outlet of No. 1 Tailrace*

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