The Office of Deputy Commissioner-cum-Chairman
District Disaster Management Authority, Kullu.
Phone No.:-01902-225633, 1077, Email id:-ddma-kul-hp@nic.in

From

The Deputy Commissioner,
District – Kullu, H.P.

To

The Principal Secretary (Revenue) to the
Government of Himachal Pradesh.

No.: -434 /SK (DM) Date Kullu the 05th October, 2023

Subject: Regarding the recommendations of the Committee for river basin changes in District Kullu, H.P.

Sir,

This is with reference to your esteemed office Notification No. Rev-DMC-F(2)-2/2023-Monsoon-L dated: 27th July 2023 regarding the constitution of a committee to visit certain habitations/areas vulnerable to flooding in the future.

It is submitted that committee has diligently conducted field visits and comprehensive assessments in the district of Kullu, focusing on river basin changes. Enclosed herewith, please find the detailed field report along with specific recommendations, as per the committee's findings.

The report provides a thorough analysis of the present condition of the river basins in the district, particularly focusing on changes in the course of the Beas, Parvati, Sainj, and Tirthan rivers. The document also includes short-term and long-term measures recommended by the committee to protect vulnerable habitations and areas from river erosion and potential flooding in the future.

This is for your information and further necessary action, please.

Encl. as mentioned above

Yours faithfully,

(Ashwani Kumar) H.A.S
Additional District Magistrate
-cum-CEO, DDMA Kullu.

Ends. No.: -435 /SK (DM) Dated: 05.10.2023

A copy is forwarded to:-

1. The Director-cum-Special Secretary (Rev.-DM) to the Government of Himachal Pradesh, Shimla-2 for information, please.

(Ashwani Kumar) H.A.S
Additional District Magistrate
-cum-CEO, DDMA Kullu.

RECOMMENDATIONS OF THE COMMITTEE FOR RIVER BASIN CHANGES IN DISTRICT KULLU, H.P.

PRELIMINARY REPORT

INTRODUCTION:-

Himachal Pradesh witnessed a severe monsoon season this year characterized by massive landslides, slope failures, rockfalls, cloudbursts, and flash floods. This monsoon has been unusually intense, with most areas experiencing significantly higher rainfall than the average. The continuous heavy rainfall reduced the land's moisture retention capacity to its minimum level, while the water levels of the rivers reached all-time high flood levels. The period from 7th to 15th July saw particularly devastating floods in Himachal Pradesh, followed by additional spells of heavy rain in August. The cumulative damage and losses have now exceeded INR 12,000 crores. District Kullu has been the worst affected, with widespread devastation in the entire Kullu valley. What makes this year's floods unique is that not only did the River Beas flood, but its tributaries, including the Parvati River, Sainj River, and Tirthan River, also experienced flooding. This unprecedented phenomenon resulted in record-high flood levels for the Beas River, causing extensive damage to road infrastructure, bridges, riverine habitations, and agricultural lands. Consequently, a specialized study of the Beas River basin is necessary to assess changes in the river's course, vulnerable habitations, and mitigation measures. Accordingly, the Govt. of Himachal Pradesh has constituted a Committee of the following members:-

1. Chief Engineer, Jal Shakti Vibhag, Zonal Office, Mandi
2. Representative of Director IIT Roorkee
3. Representative of Director GSI, Chandigarh
4. ADM Kullu-cum-CEO DDMA Kullu
5. Sh. Gaurav Sharma, Geologist, Directorate of Industries

TERMS OF REFERENCE:-

The committee's terms of reference include:

1. Assessing the current condition of the Beas, Parvati, Sainj Rivers in Kullu District regarding changes in course post-flooding and identifying vulnerable habitations/areas for future flooding.
2. Recommending short-term measures, if necessary, to protect these vulnerable habitations/areas from river erosion and future flooding.
3. Proposing long-term measures, including a strategy for auctioning mining leases in these rivers, to minimize damage in future flooding events.

The committee has conducted a field visit of the river Beas, Parvati, Sainj and Tirthan on dated 7th and 8th September. During the field visit, the Committee members visited all the locations where river course has been changed. In addition to it, the committee members visited all the vulnerable habitations too, which have become vulnerable for future flooding. The details of the places visited along with photographs are enclosed as **Annexure-"A".**

KEY OBSERVATIONS:-

- The riverbed of the Beas River is very wide and change in river course is a natural phenomenon during floods.
- The formation of islands has been a dominant factor for river course changes. The issue has been studied in past by CWPRS through model studies.
- In some places the river course changes can be attributed to various types of human interventions too i.e., c/o protection walls, encroachment etc.
- In many places, the river course change has been seen in the point of confluence too wherein the primary factor is deposit of huge debris and boulders by the tributary stream.
- The protection works for the National highway, towards river side and mountain side, have been severely damaged at several locations.

RECOMMENDATIONS:-

Based on the field visits and close observations of the sites, the committee is of the view that various structural and non-structural interventions are required to be undertaken to protect the vulnerable sites which are as follows:-

1. The restoration of National Highway and other major roads should be done immediately after conducting proper studies on behavioral pattern of the river Beas, its hydrological analysis and road engineering techniques.
2. The alternate highways of connectivity between different placed should be restored and strengthened. These alternate routes have proved their utility in the past and in the present crisis.
3. Immediate structural interventions are required to be undertaken in the habitations, which have become highly vulnerable due to river course change and flooding.
4. The required structural interventions should be done immediately and completed before the onset of next monsoon.

5. In order to protect the habitations and critical infrastructures situated along the Beas river, the channelization and river training is required to be done as it has been observed that the river bed level has raised in many locations due to continuous deposit of debris and boulders every year. The report of the CWPRS need to be used as a reference point to undertake any changes within river courses.
6. It is recommended that, state govt. should formulate a comprehensive River Dredging Policy under the provisions of Disaster Management Act-2005 and lay down proper procedure for dredging of rivers scientifically with minimum harm to the river ecosystem.
7. As a mitigation measure, it is recommended that river training works in most vulnerable sites should be undertaken immediately after the retreat of monsoon. In such locations the rocks, boulders, debris etc. extracted from the river course should be used for the protection of its banks and habitations.
8. The demarcation of prohibited and restricted zones, corresponding to the 25 and 50 years flood frequency lines for the Himachal Rivers, in line with the guidelines of NDMA guidelines, should be undertaken to minimize any damage to the river ecosystem due to development, as a long-term measure.

Short Term Measures

1 The revenue department identifies the actual course of the river so that the planning to reclaim the land can done.

2 The HFL should be marked on different permanent structure making the public aware of it.

3 Dredging of the deposits in the course of river to be done at first instance.

4 The material obtained from dredging should be stacked along the river bank to check the erosion of banks.

Long Term Measures

1 Design and construction of river training works.

2 Regular maintenance of river training works and regular dredging of river bed.

3 Strict compliance of the instruction issued by Hon'ble NGT for the construction beyond the HFL.

(Ashwani Kumar) **Member Secretary**
Additional District Magistrate-cum-
Chief Executive Office, DDMA Kullu, H.P.

(Upender Vaidya) **Chairman**
Chief Engineer, Jal Shakti Vibhag,
Zonal Office, Mandi, H.P.

Annexure – "A"

Field Report of the Committee to Address Impact of River Course Changes and Flooding

Introduction: The committee was constituted in response to the significant losses incurred due to incessant rainfall between July 8th and 11th, 2023, amounting to a direct loss of Rs. 1200 Crore across the district. The heavy precipitation during this period resulted in various rivers changing their course, posing a threat to habitation and making certain areas vulnerable to future flooding. This field visit aimed to assess the impact of river course changes and flooding and recommend short and long-term measures to mitigate these risks.

Field Visit Locations: The committee visited multiple critical points in the affected areas, including:

1. **Kalath:** Coordinates: 32° 14' 41"N, 77° 11' 27" E

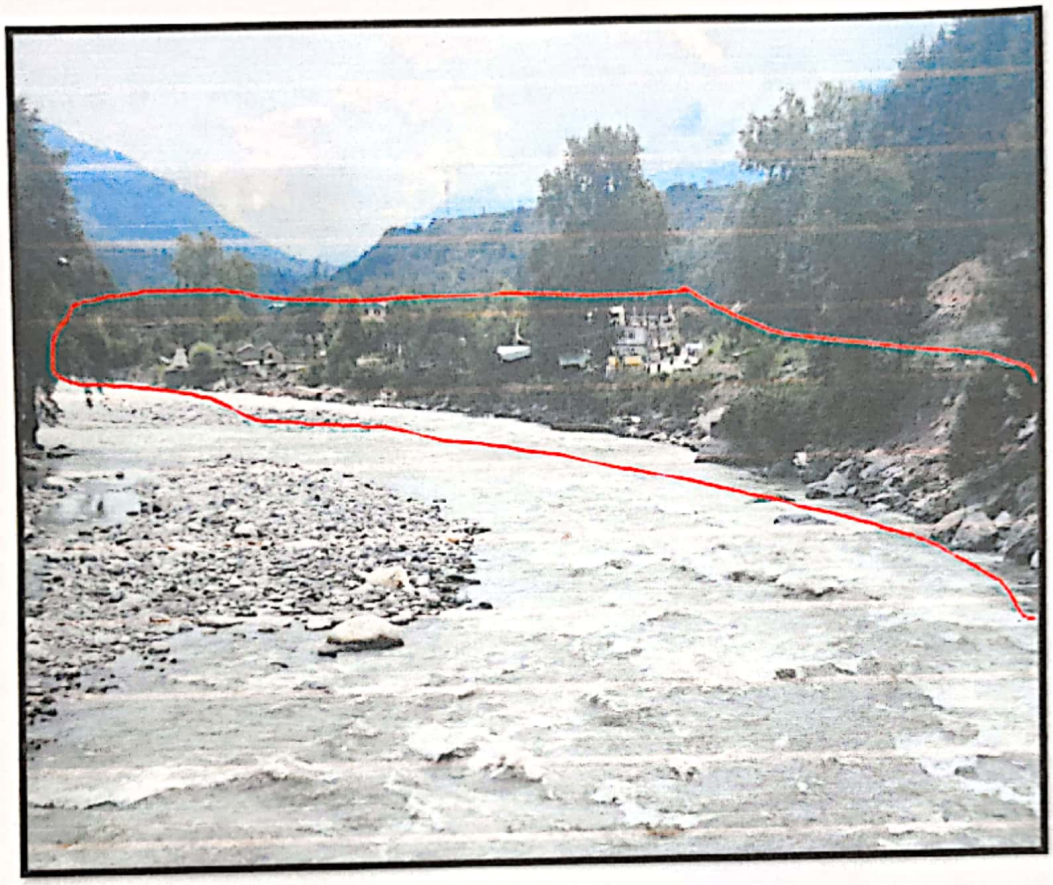
2. **Aloo Ground:** Coordinates: 32° 12' 04"N, 77° 11' 23" E

3. **Bahang:** Coordinates: 32° 16' 29"N, 77° 10' 48" E

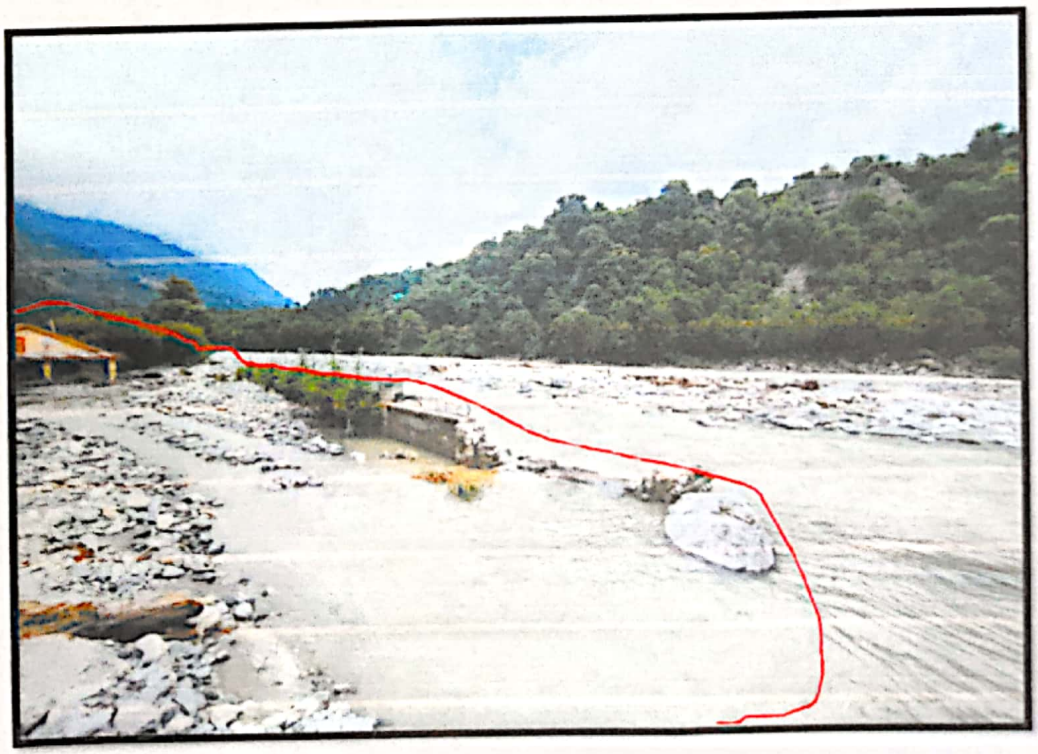
4. **Bahnu:** Coordinates: 32° 16' 29"N, 77° 10' 35" E

5. **Bran:** Coordinates: 32° 09' 58"N, 77° 09' 24" E

6. **15 Mile Bridge:** Coordinates: 32° 08' 13"N, 77° 09' 32" E

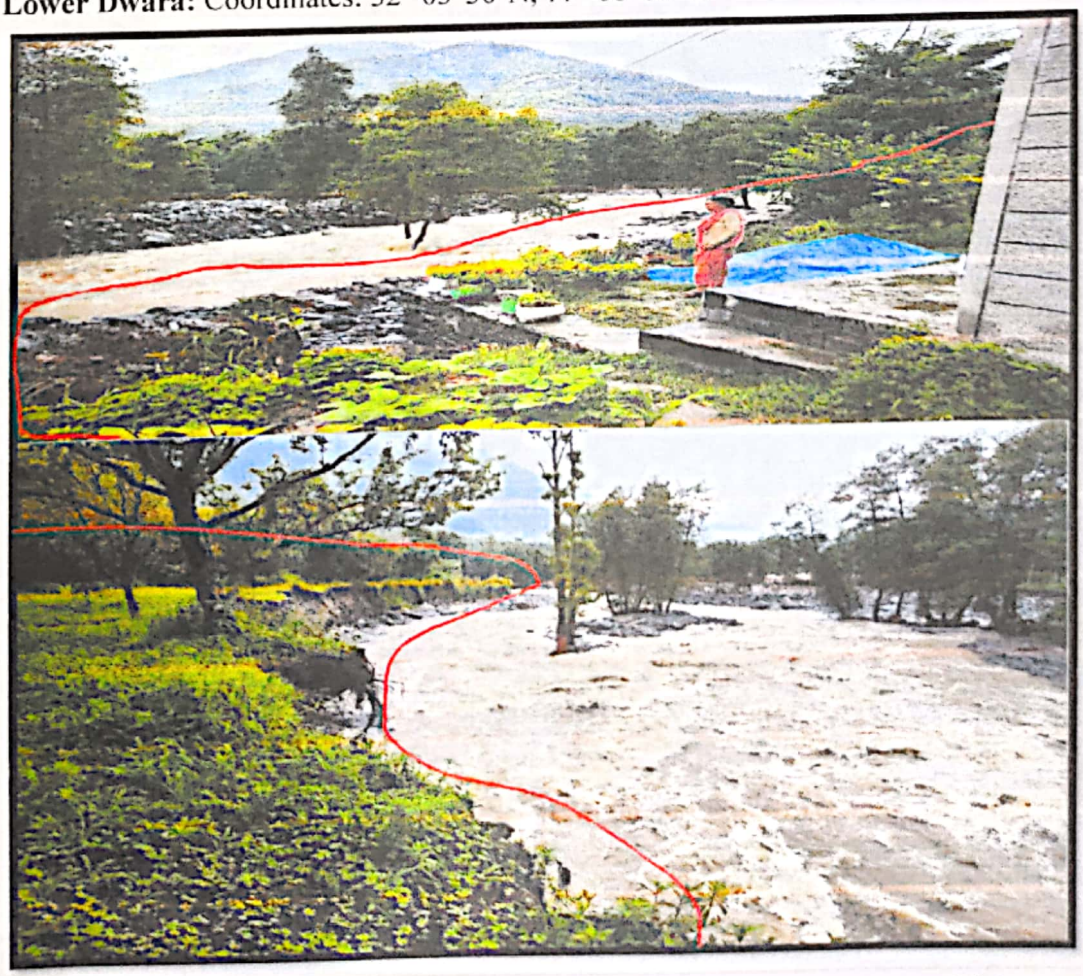


7. **14 Mile Inner Colony:** Coordinates: 32° 06' 47"N, 77° 08' 59" E



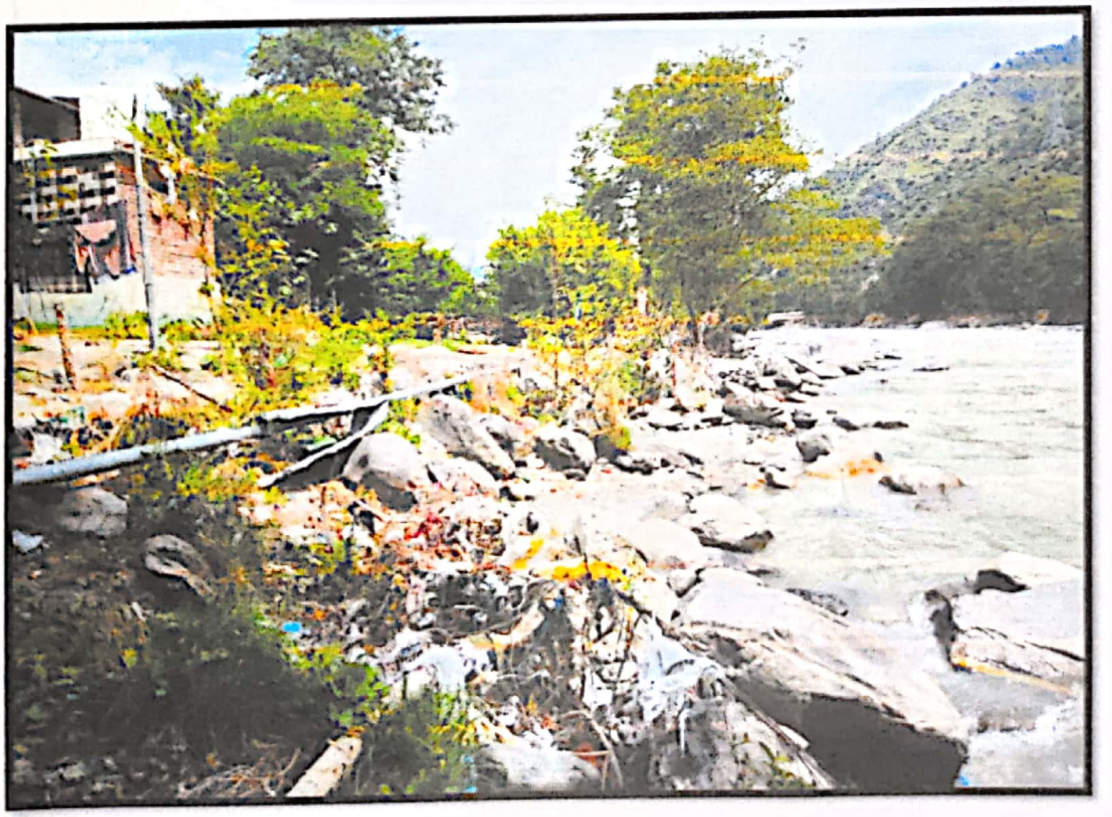
8. **Patlikuhal New Sabzi Mandi:** Coordinates: 32° 05' 26"N, 77° 07' 48" E

9. **Lower Dwara:** Coordinates: 32° 03' 30"N, 77° 08' 07" E



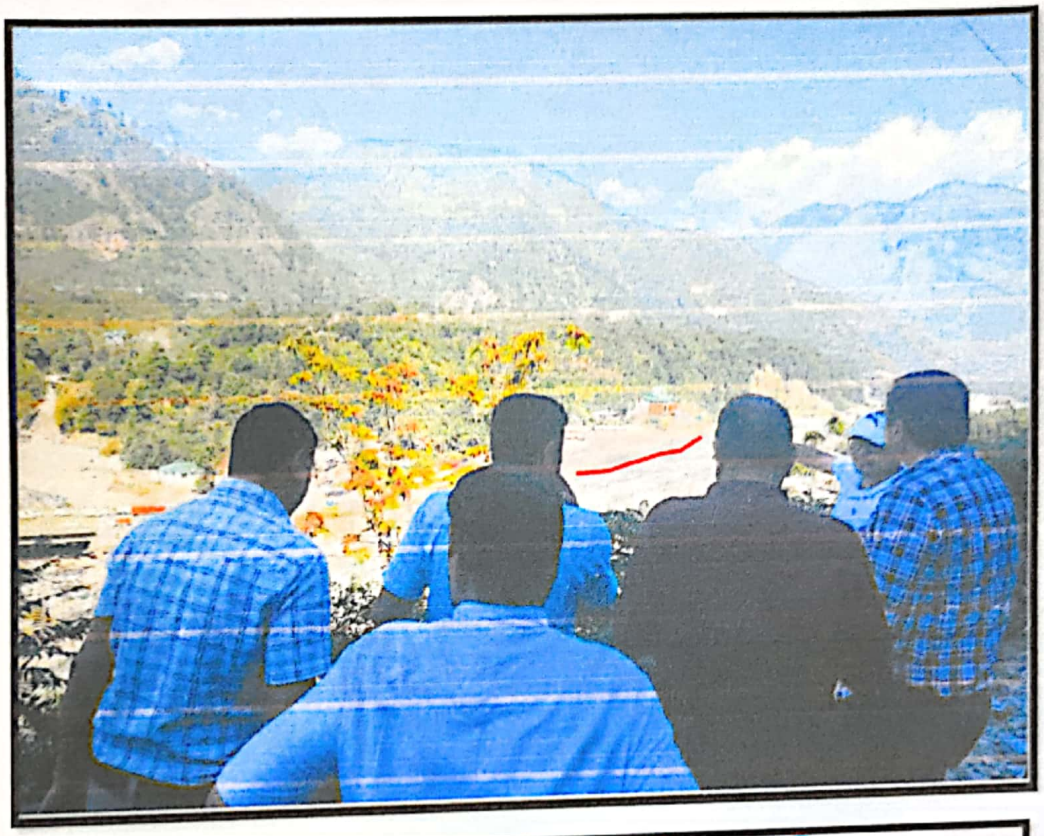
10. Raison Bazar: Coordinates: 32° 05' 26"N, 77° 07' 48" E

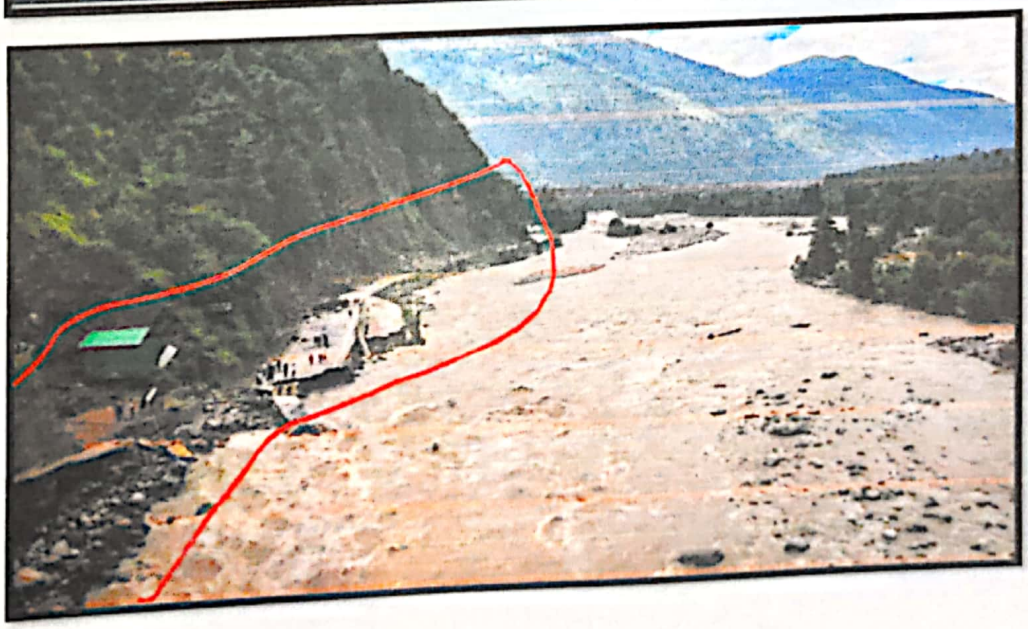
11. Raison Bihal: Coordinates: 32° 08' 46"N, 77° 09' 24" E



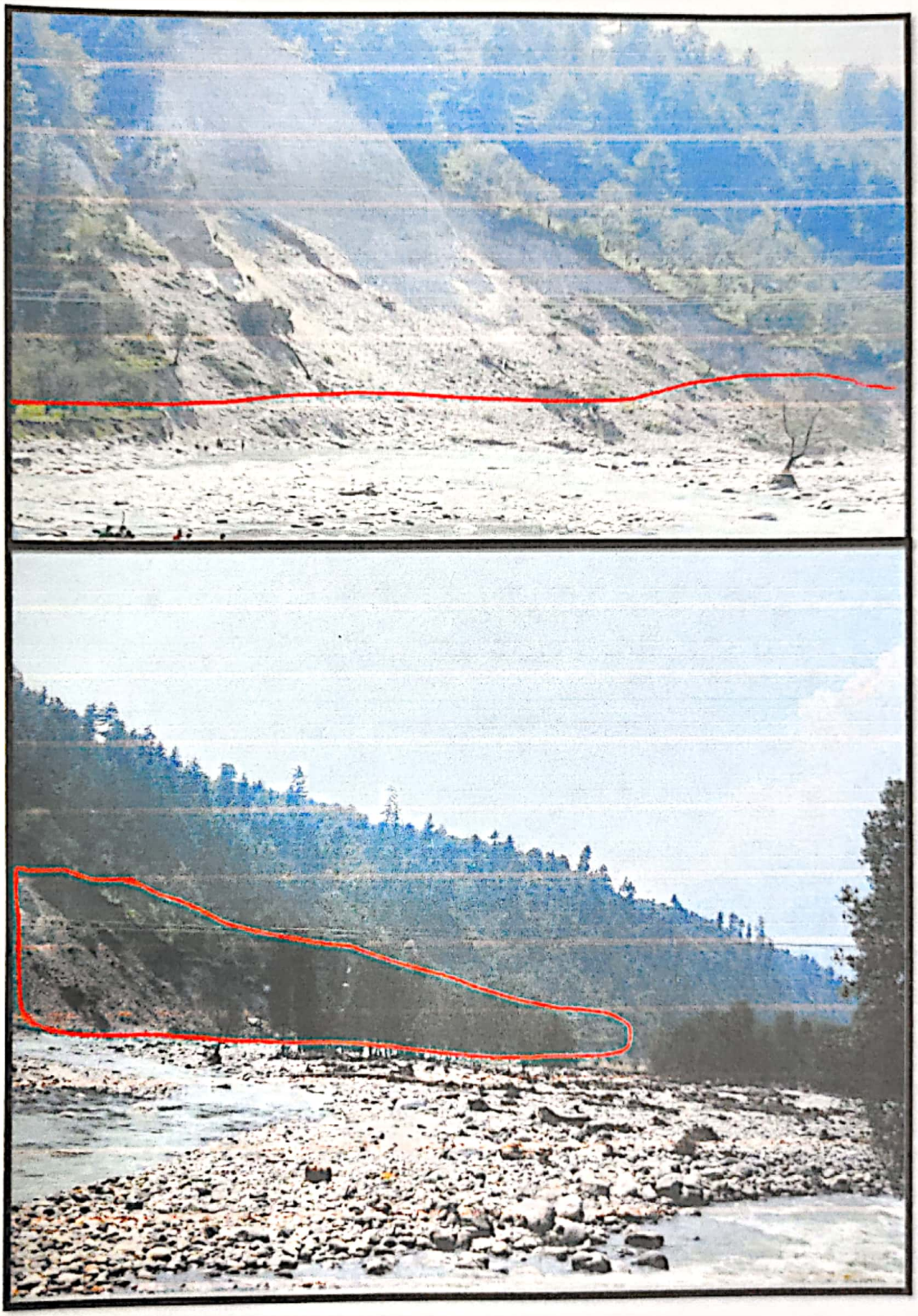
12. Village Mahili P.O. Nagar: Coordinates: 32° 06' 47"N, 77° 08' 59" E

13. Dobhi VPO Raison Near Shirar Resort: Coordinates: 32° 06' 47"N, 77° 08' 59" E



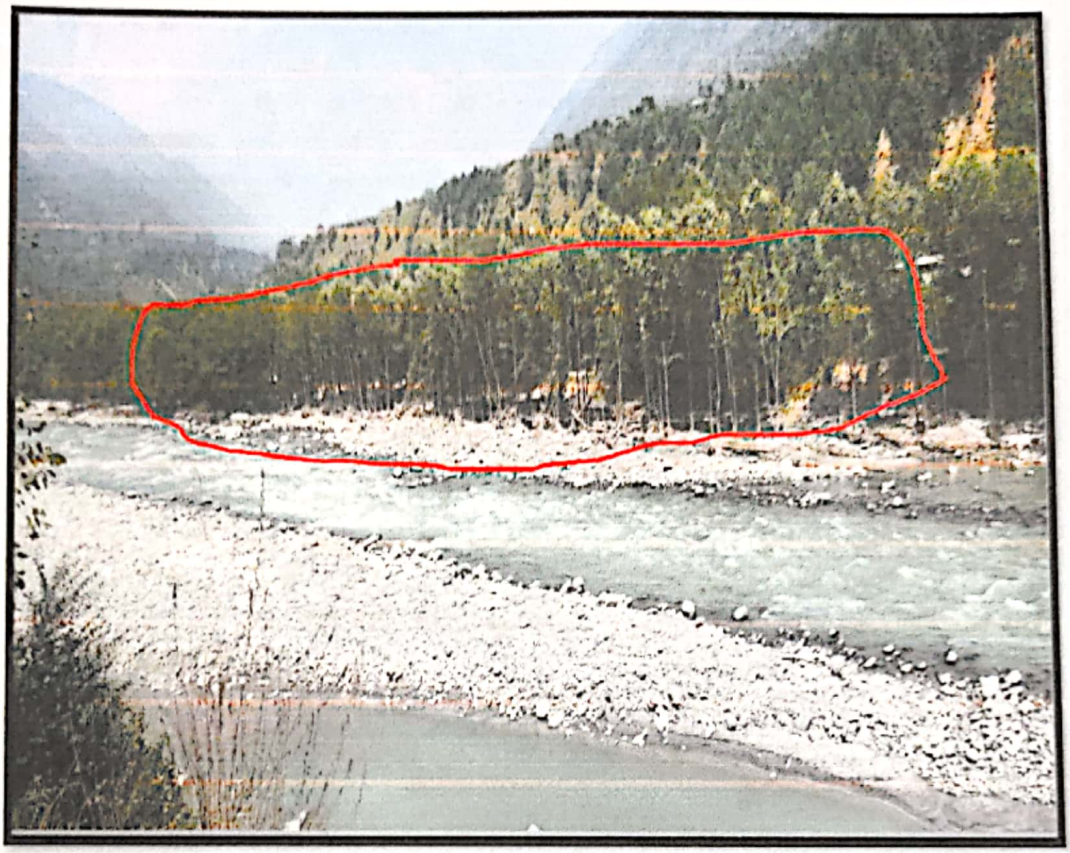


14. Nathan, Village Mahili, PO Katrain: Coordinates: 32° 06' 47"N, 77° 08' 59" E



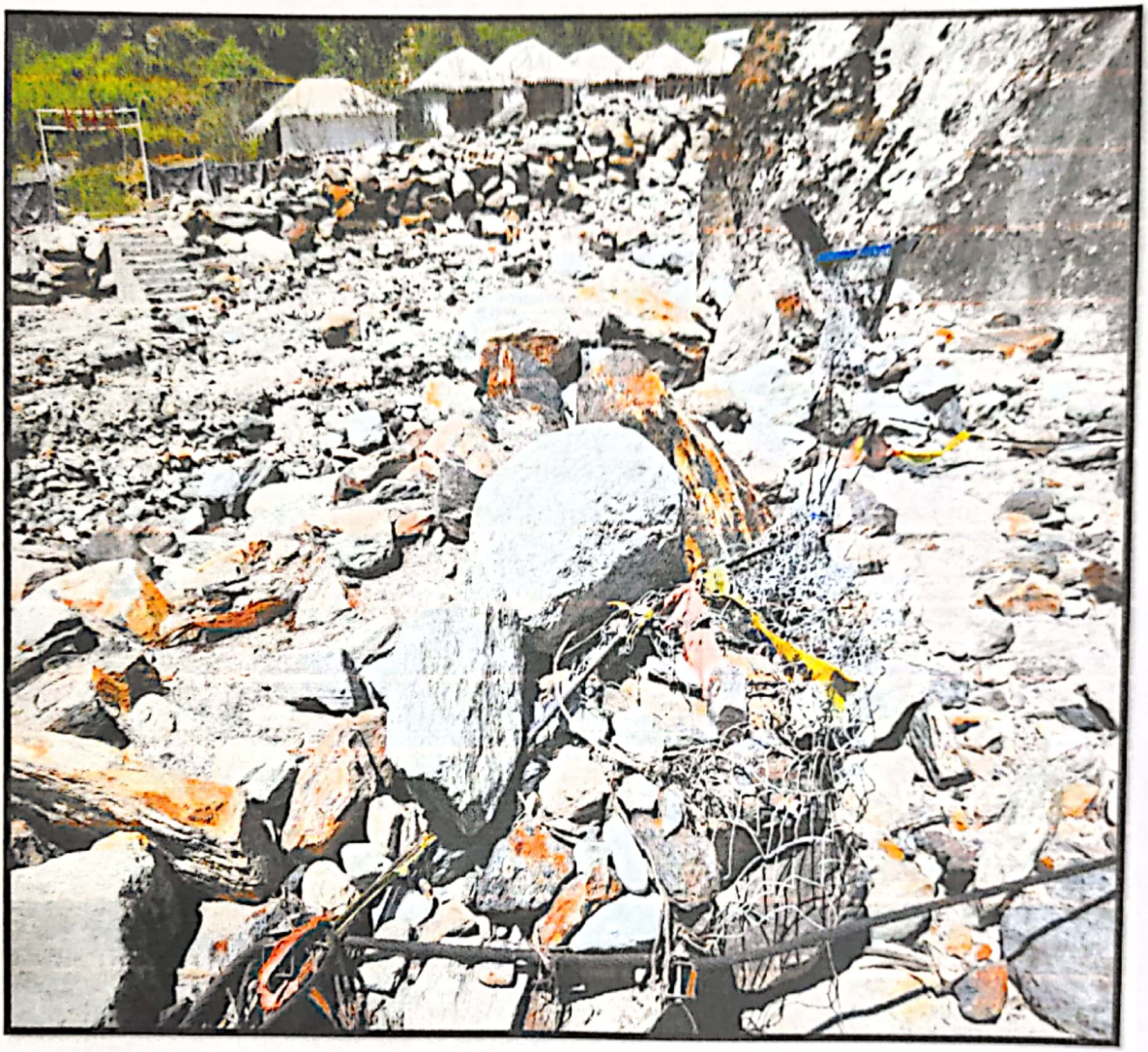
15. Katrain, Village Jatehad, PO Katrain: Coordinates: 31° 99893 , Longitude 77° 127552

16. Kais, Village Seobag: Coordinates: Latitude 32.108999, Longitude 77.151047



Summary of Critical Points Visited: The committee observed and assessed several vulnerable points along the River Beas, Parvati, Sainj, and Jibhi rivers. Below are the key findings and recommendations for each location:

Location 1: Below Village Breuna (Manikaran) near Harison Project
Coordinates: 32°01'46"N & 77°21'05"E

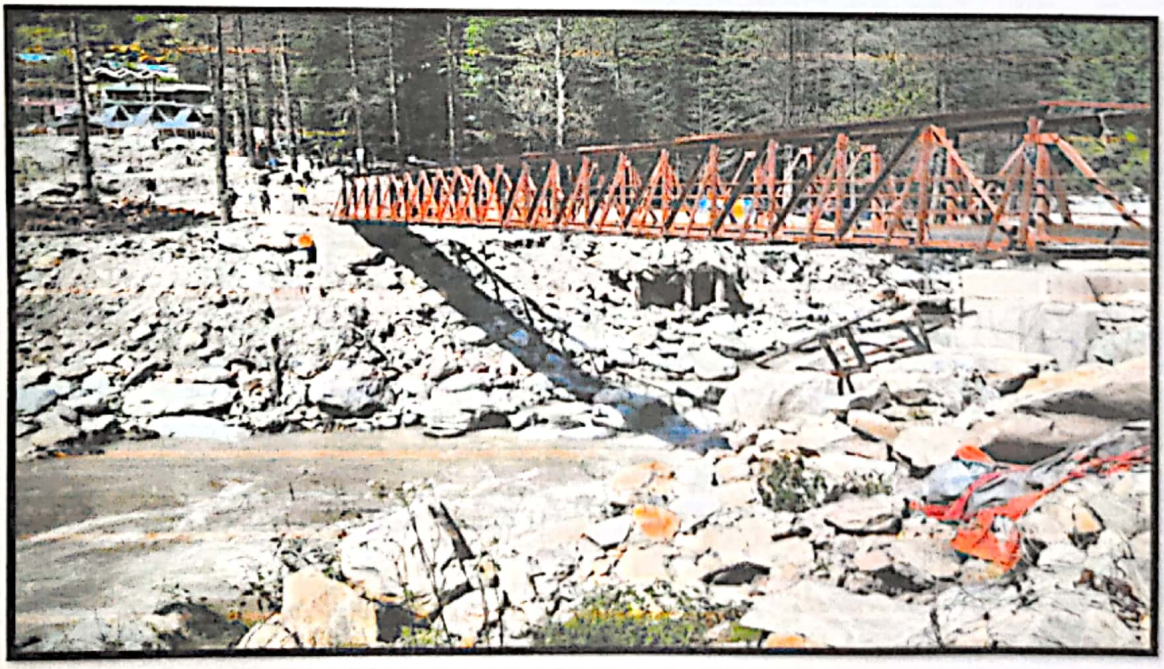


- **Short Term Measure:** Gabion structure for toe protection to delay sinking process.
- **Long Term Measure:** Soil conservation with drainage arrangement around the village for runoff is suggested. Structural work is not feasible due to topographical constraints and large sinking mass.

Location 2: Manikaran Coordinates: 32°01'36"N & 77°21'03"E

- **Short Term Measure:** Removal of larger boulders from the center of the waterway during lean periods. There is immediate necessity of embankment protection on Right bank of River Parvati as the construction of protection wall is possible only in lean discharge period i.e. October to January month.
- **Long Term Measure:** RCC Cantilever or Counterfort structure for embankment protection.

Location 3: Choj Coordinates: 32°01'01"N & 77°19'42"E



- **Short Term Measure:** Clear the waterway of Choj Nalla up to 100 meters from the confluence point with River Parvati.
- **Long Term Measure:** Implement river training measures for Choj Nallah and its confluence point.

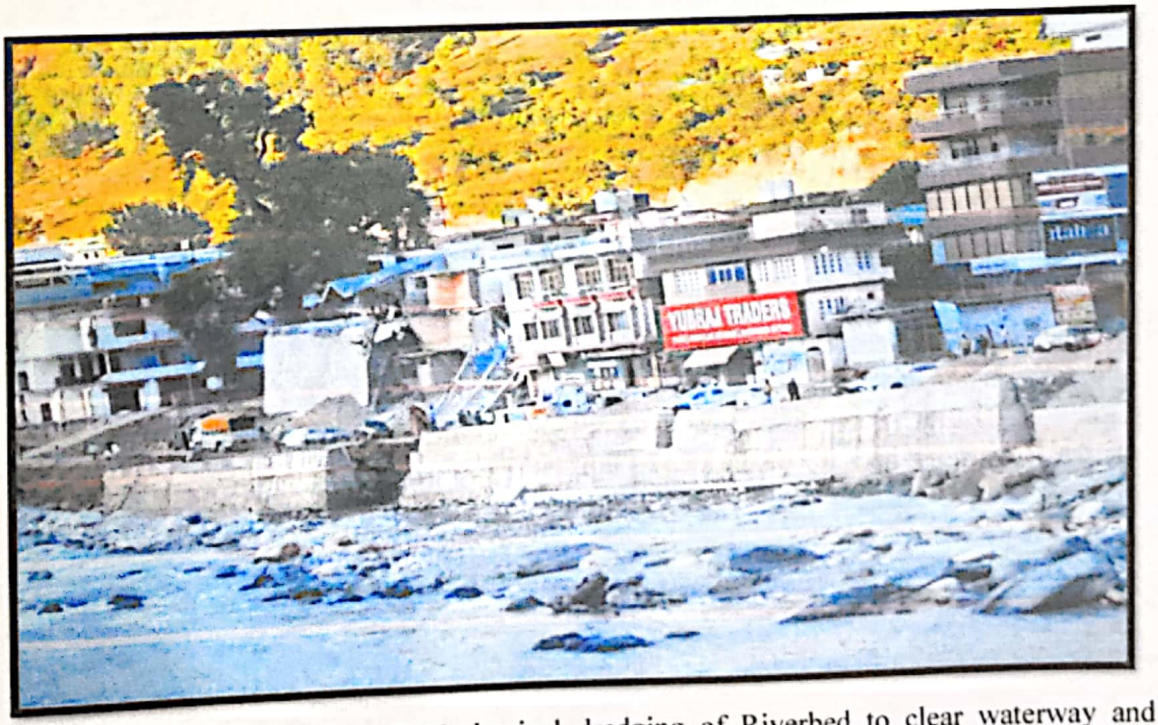
Location 4: U/s Kasol Camps at Kasol Coordinates 32°00'48"N & 77°19'15"E

- **Short Term Measure:** Gabion embankment.
- **Long Term Measure:** RCC Cantilever or counterfort wall and river training work at the upstream of Kasol camp.

Location 5: Katagla Coordinates: 32°00'35"N & 77°17'30"E

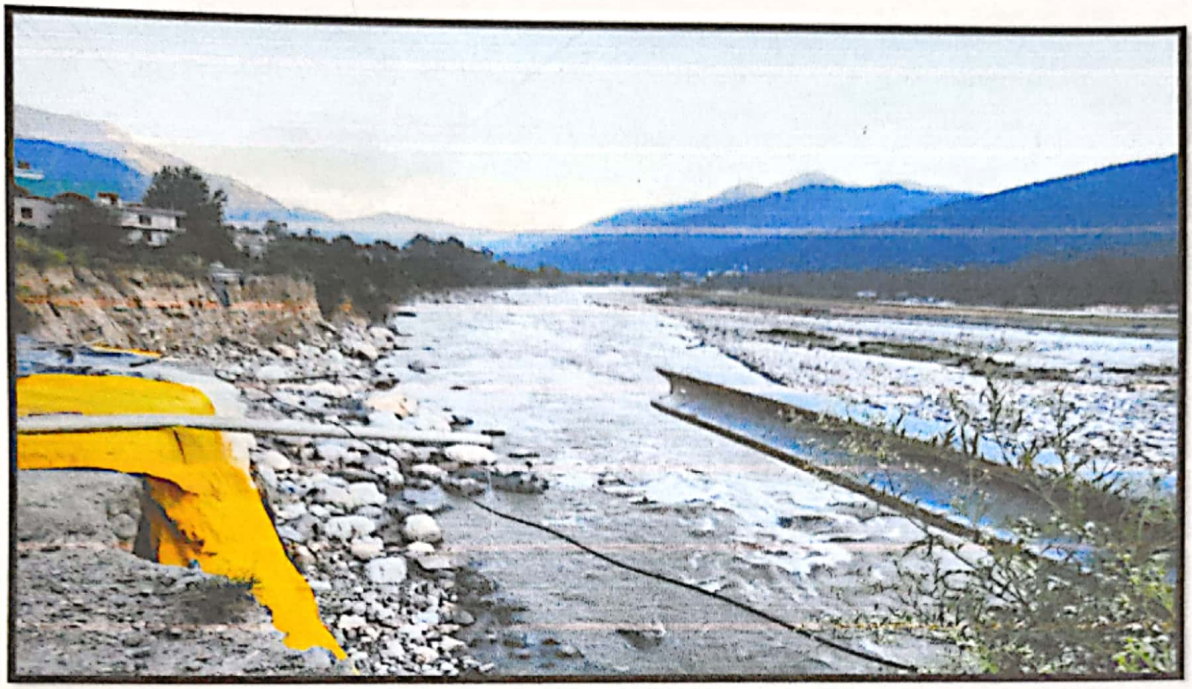
- **Short Term Measure:** Gabion embankment and mechanical dredging of the riverbed to clear the waterway.
- **Long Term Measure:** Implement embankment protection works using Gabions, RCC, or PCC with apron.

Location 6: Bhunter (Confluence point of River Beas and River Parvati)
Coordinates: 31°53'15"N & 77°08'54"E



- **Short Term Measure:** Mechanical dredging of Riverbed to clear waterway and removal of Tapoo.
- **Long Term Measure:** Implement embankment protection using RCC, Gabions, and apron.

Location 7: Chhota Buin opposite Kullu Manali Airport
Coordinates 31°52'46"N & 77°09'19"E



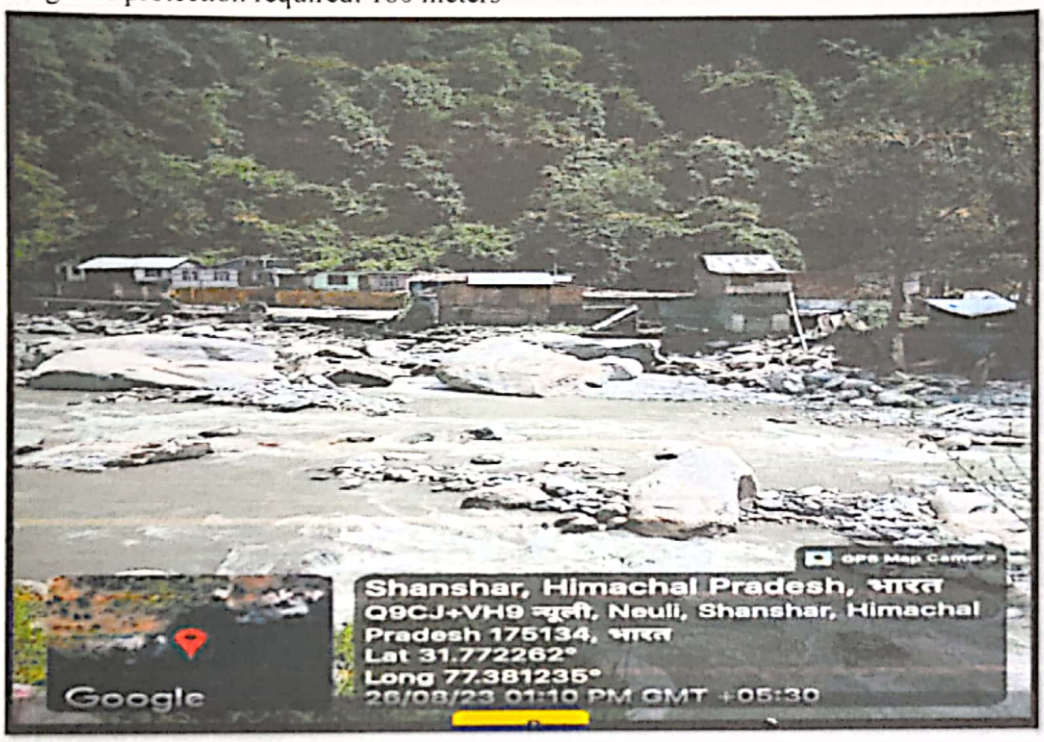
- **Short Term Measure:** Gabion walls for toe protection on the left bank, mechanical dredging of the riverbed, and removal of Tapoo.
- **Long Term Measure:** Implement embankment protection with RCC, Gabions, and apron.

Location 8: Sarwari Confluence point to Shastri Naggar
Coordinates: 31°56'54"N & 77°06'39"E

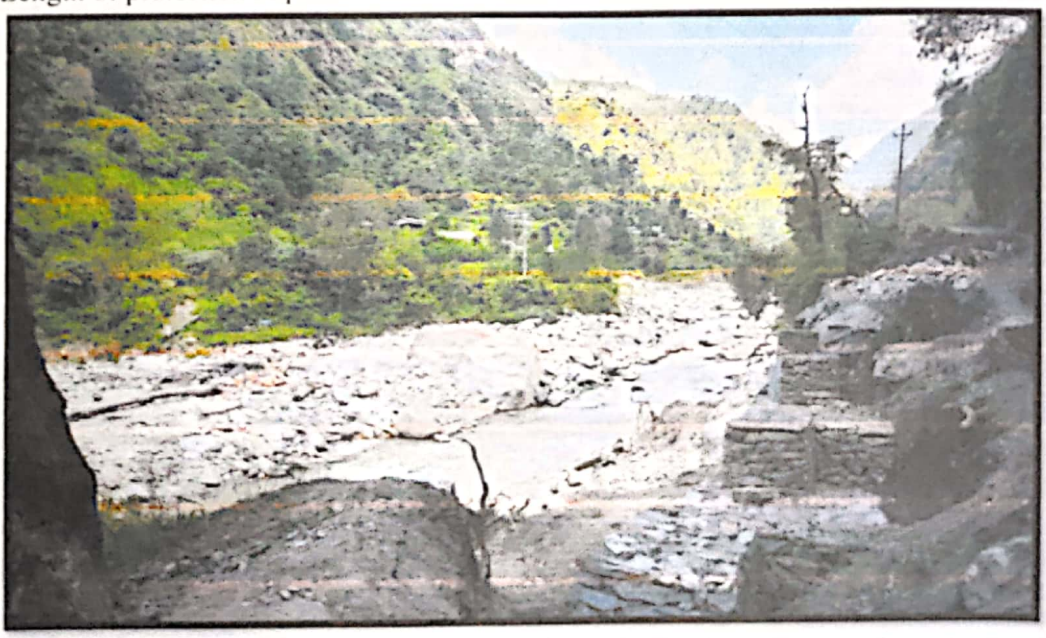
- **Short Term Measure:** Gabion walls or PCC wall for toe protection on the right bank, mechanical dredging of the riverbed, and removal of Tapoo.
- **Long Term Measure:** Implement embankment protection with RCC and apron from the confluence point of Sarwari nalla with River Beas to STP Badah.

Other Locations: Sainj Khad The committee also assessed damage along the Sainj Khad and identified the length of protection required at various locations.

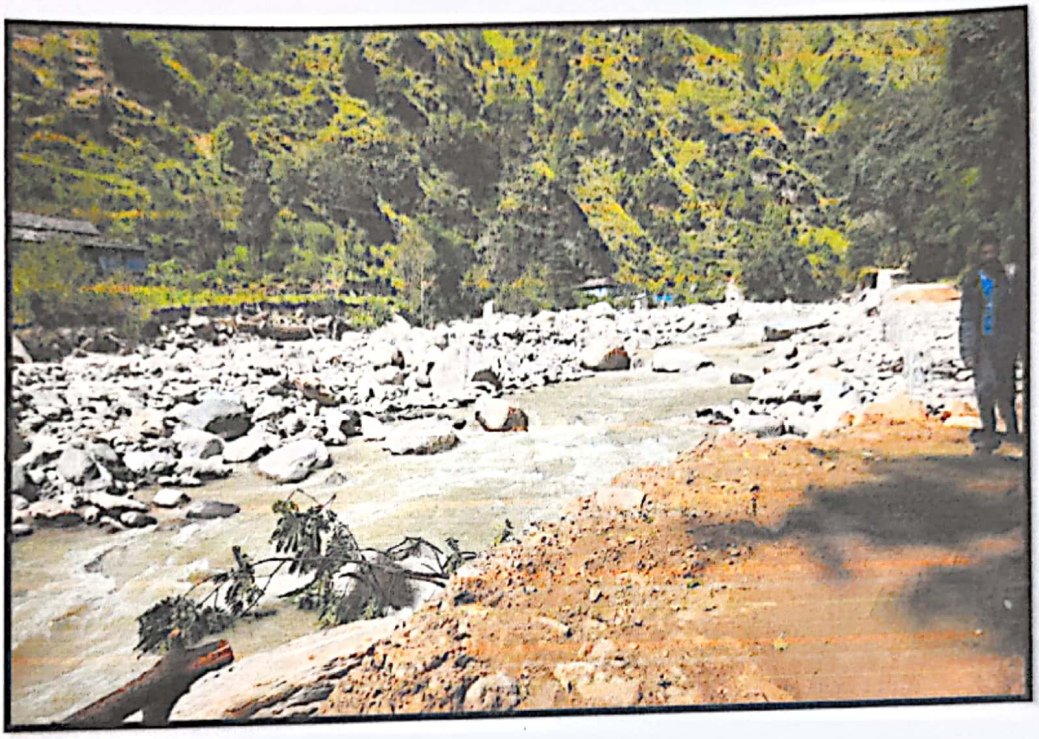
- **Neuli**
  N-31.7722620 E-77.381235
  Nature of damage: Residential/Public Property damaged (Sainj Khad)
  Length of protection required: 180 meters



- **Satesh:**
  N-310-46'181 E-770-22'-41
  Nature of damage : Agriculture Land damaged (Sainj Khad)
  Length of protection required : 220 meters



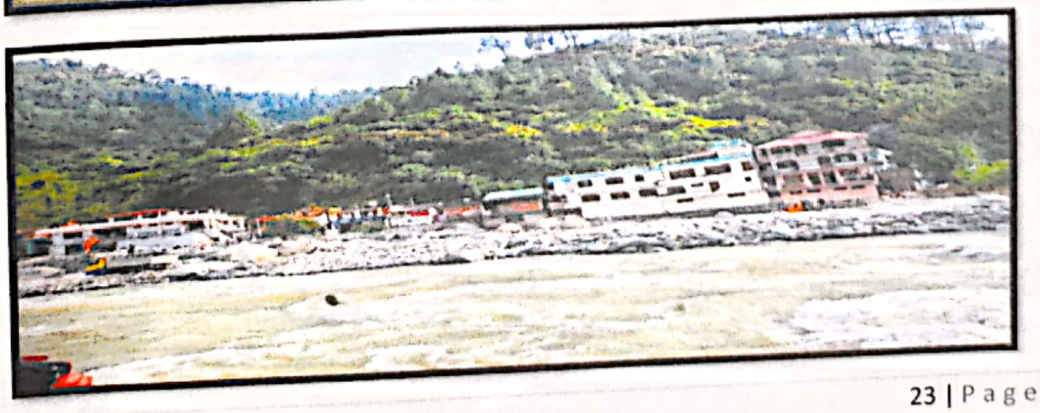
- **Ropa:**
  N-310-46'34' E-770-21'-41.3"
  Nature of damage: Agriculture Land/Residential building damaged (Sainj Khad)
  Length of protection required: 380 meters



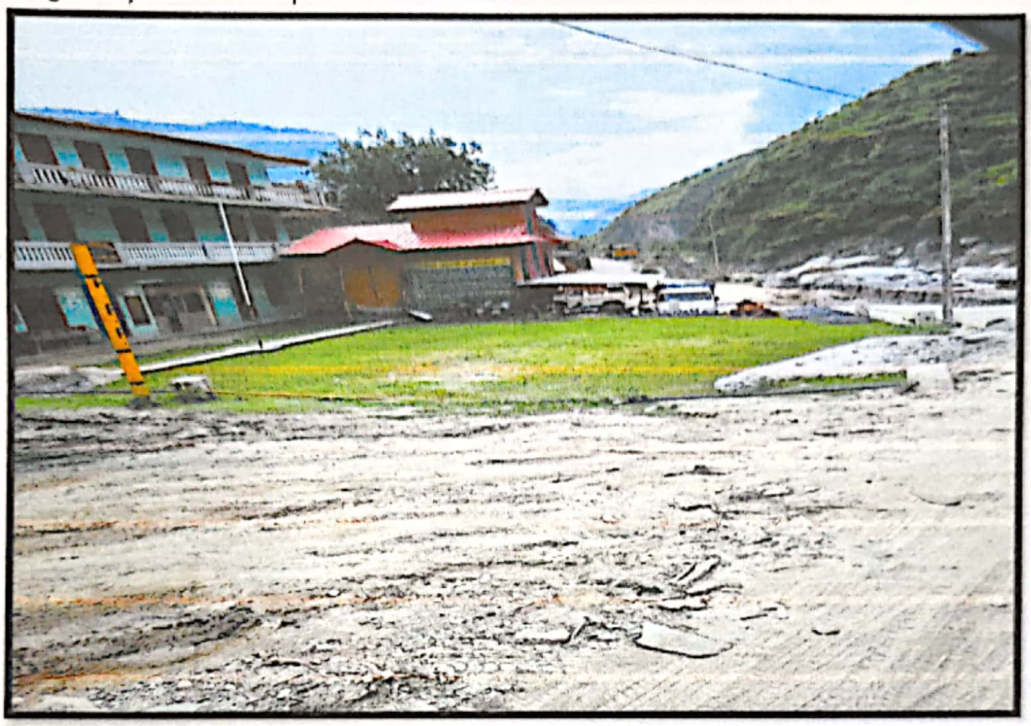
- **Jiwa & Sharan:** 180 meters
  N-310-47'28' E-770-19'-51"
  Nature of damage: Agriculture land damaged (Sainj Khad)
  Length of protection required: 180 meters

- **Bodali Mata:**
  N-310-46'21.9' E-770-18'-59.8"
  Nature of damage: Agriculture Land, Residential buildings damaged (Sainj Khad)
  Length of protection required: 210 meters

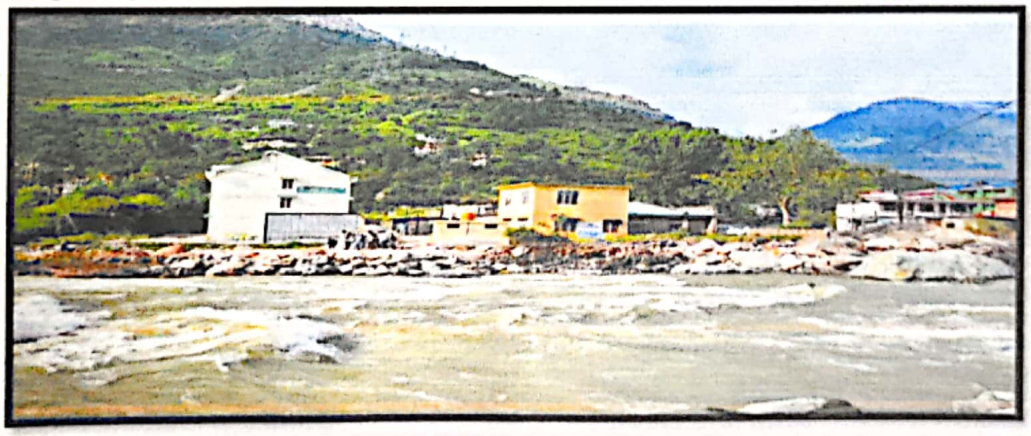
- **Sainj Market:**
  N-310-46'16.5' E-770-18'-33.6"
  Nature of damage: Residential/Public Property damaged (Sainj Khad)
  Length of protection required: 800 meters



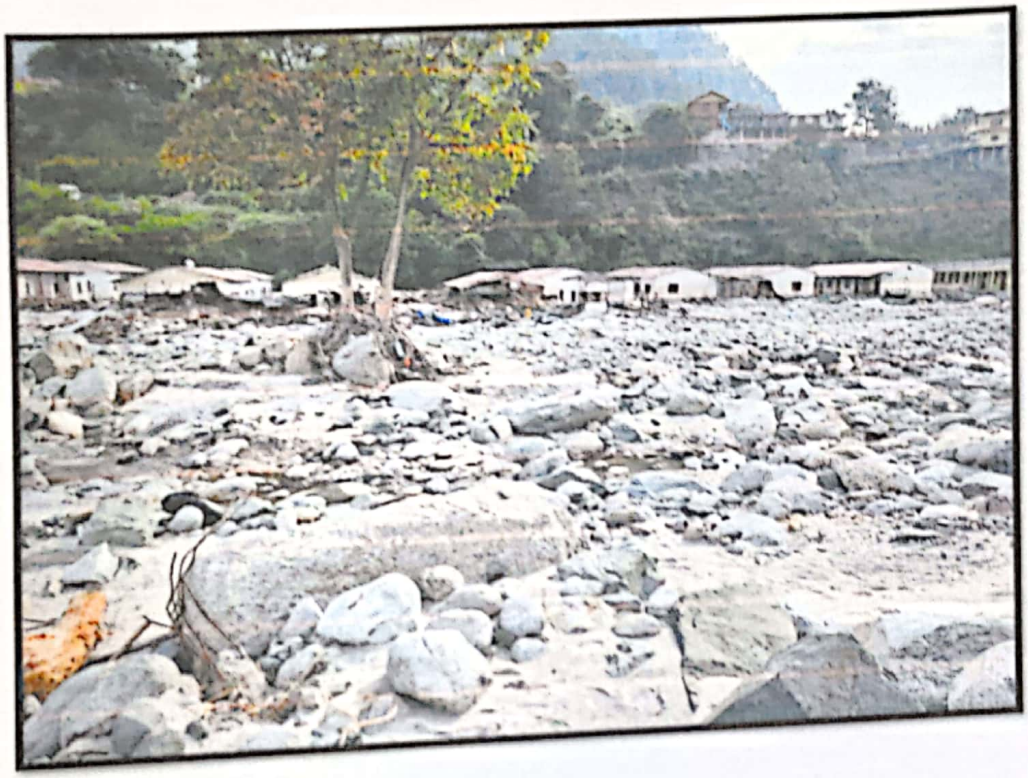
- **Bodali Mata:**
  N-310-46'21.9' E-770-18'-59.8"
  Nature of damage: Agriculture Land, Residential buildings damaged (Sainj Khad)
  Length of protection required: 210 meters



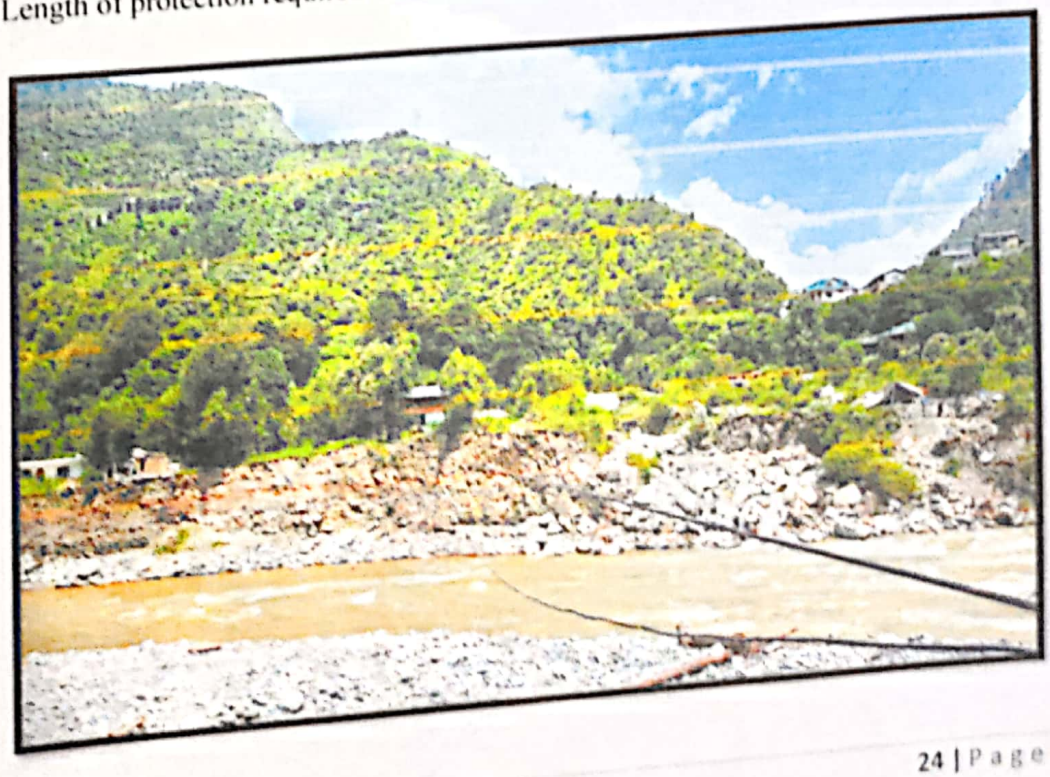
- **Sainj Market:**
  N-310-46'16.5' E-770-18'-33.6"
  Nature of damage: Residential/Public Property damaged (Sainj Khad)
  Length of protection required: 800 meters



- **Bakhshal:**
  N-310-46'15.3' E-770-18'-13.6"
  Nature of damage: Agriculture Land Residential buildings damaged (Sainj Khad)
  Length of protection required: 260 meters



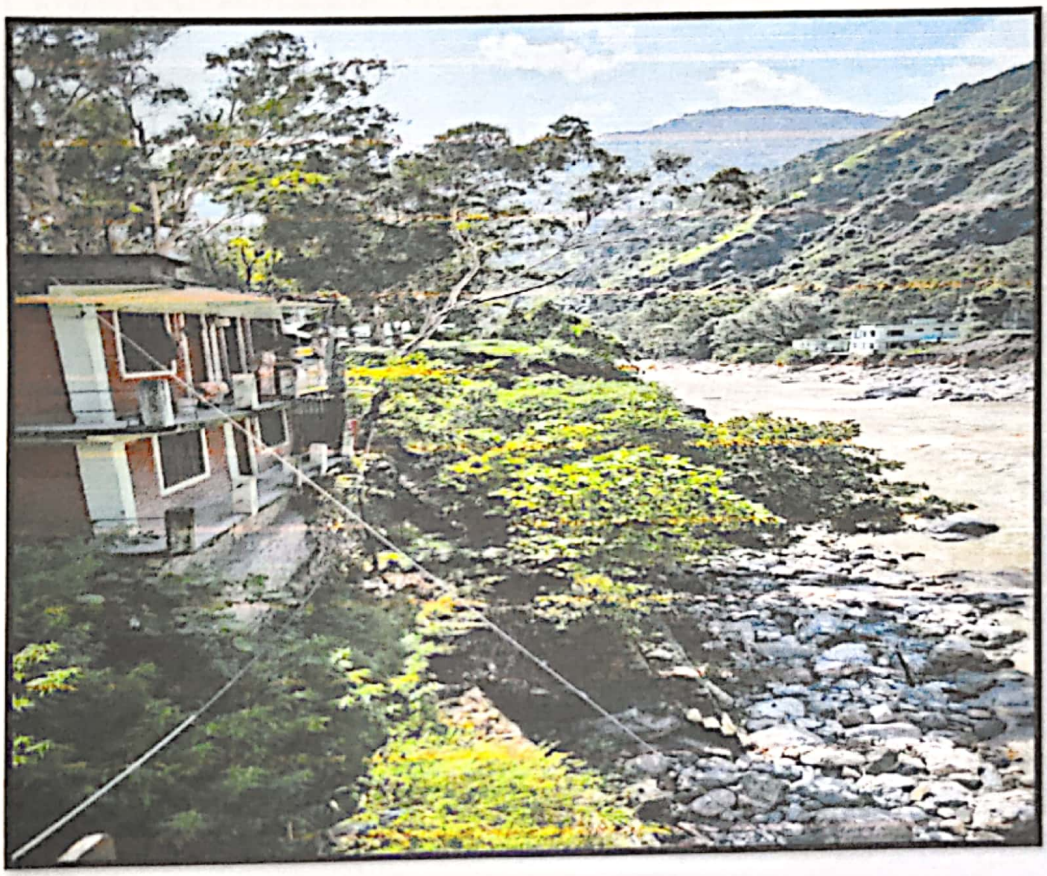
- **Bekar:**
  N-310-46'3.3' E-770-16'-24.5"
  Nature of damage: Agriculture land/Residential buildings damaged (Sainj Khad)
  Length of protection required: 450 meters



- **Tareda:**
  N-310-46'3.3' E-770-16'-24.5"
  Nature of damage : Agriculture land damaged (Sainj Khad)
  Length of protection required : 220 meters

- **Spangani:**
  N-310-45'19.5' E-770-15'-1.6"
  Nature of damage: Agriculture/Horticulture Land damaged (Sainj Khad)
  Length of protection required: 480 meters

- **Larji:**
  N-310-43'36.4' E-770-13'-34.4"
  Nature of damage: Public Property damaged (Sainj Khad)
  Length of protection required: 220 meters



- **Gushaini**
  N 31° 38.203' E 77°25.892'
  Nature of damage: Residential/ public property damaged (Tirthan Khad)
  Length of protection required: 850 meters

- **Location – Jabal (Tirthan river)**
  N 31° 38.491' E 77°24.849'
  Nature of damage: Residential property & agricultural land damaged
  Length of protection required – 750 meters

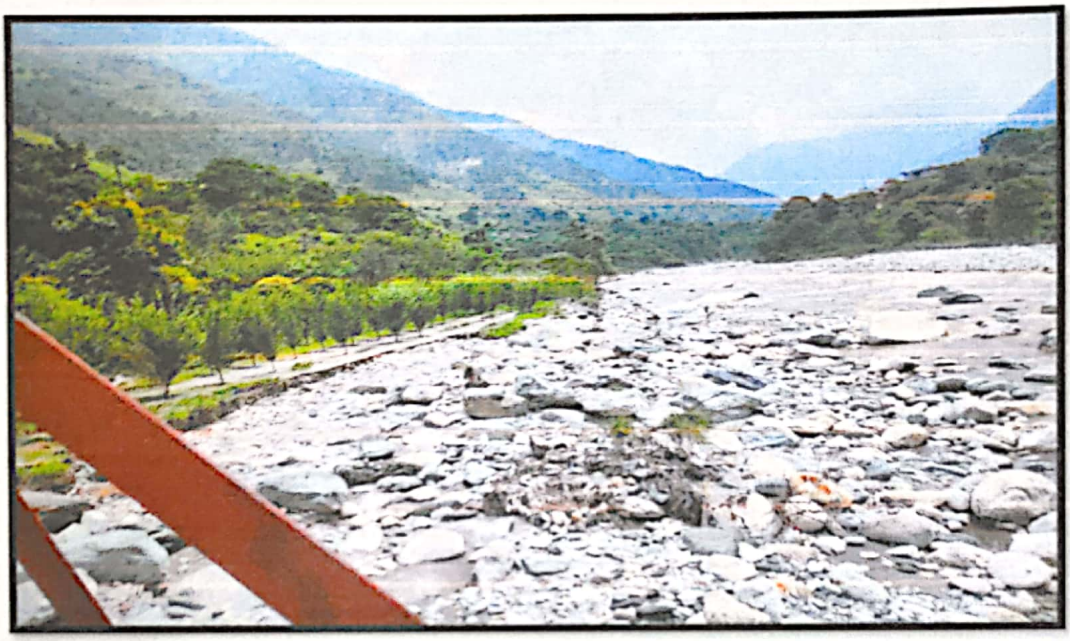
- **Location – Dari**
  N 31° 38' 26" E 77°24' 07"
  Nature of damage: Erosion of agricultural land and liquefaction of soil.
  Length of protection required – 550 meters

- **Location – Kaluropa (Tirthan River)**
  N 31° 38' 45" E 77°21' 56"
  Nature of damage: Erosion of agricultural land and threat to private property.
  Length of protection required – 600 meters

- **Location – Horngad (Tirthan river)**
  N 31° 38' 44" E 77°24' 09"
  Nature of damage: Erosion of agricultural land and liquefaction of soil.
  Length of protection required – 650 meters

- **Location – Sharai (Tirthan River)**
  N 31° 39' 05" E 77°19' 56"
  Nature of damage: Erosion of agricultural land and liquefaction of soil.
  Length of protection required – 650 meters

- **Location – Manglore(Tirthan River)**
  N 31° 40' 00" E 77°18' 31"
  Nature of damage: Erosion of agricultural land.
  Length of protection required – 700 meters



- **Location – Dhadudhar (Jibhi Khad)**
  N 31° 38' 34" E 77°20' 33"
  Nature of damage: Damage of Private property & agricultural land.
  Length of protection required – 600 meters

- **Location – Khundan (Tirthan River)**
  N 31° 38' 53" E 77°20' 58"
  Nature of damage: Erosion of agricultural land and damage of private property.
  Length of protection required – 700 meters

Conclusion: The committee has made detailed assessments and provided short and long-term recommendations for each critical location visited. These measures aim to protect vulnerable areas from river erosion and future flooding.

(Ashwani Kumar) Member Secretary
Additional District Magistrate-cum-
Chief Executive Office, DDMA Kullu, H.P.

(Upender Vaidya) Chairman
Chief Engineer, Jal Shakti Vibhag,
Zonal Office, Mandi, H.P.