

## Disaster and Livelihood of the Affected Population: Case study of June 2013 disaster in Rudraprayag district of Uttarakhand

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### Abstract

Economic impact of disaster and utilisation pattern of the relief is assessed through semi-structured questionnaire and focused discussions in Rudraprayag district of Uttarakhand in India that was devastated by floods in June, 2013. It is observed that in the absence of risk transfer tools the disaster affected population, particularly those engaged in petty business and representing weaker sections of the society, find it hard to replenish their productive assets lost in the disaster due to (i) the relief amount being significantly less than market value of lost assets, (ii) limited savings, (iii) relief amount spent on non-productive household purposes owing to reduced income in the post-disaster phase, and (iv) poor access to institutional financing. The state is therefore advised to initiate an organised scheme with the involvement of financial institutions to facilitate replenishment of productive assets lost in disaster incidences rather than providing cash relief, and ensure insurance of the assets so created as the voluntary adoption of risk transfer tools is unlikely to come by soon.

**Key words:** Economic recovery, risk transfer, disaster relief, Mandakini Valley, Uttarakhand Himalaya

### 1. Introduction

Located in the Himalayan region Uttarakhand province of India is vulnerable to a number of natural hazards that include earthquake, landslide, flood, and flash flood and these are owed to geological history, physiography, geo-tectonic set up and meteorological conditions of the terrain [1-3]. Except earthquake, other hazards generally occur during the monsoon period - rainy season in the Indian subcontinent [4-6] and apart from the loss of human lives, these result in loss of productive assets adversely affecting quality of life of the affected population.

In the summers of 2013 Uttarakhand received abnormally high rainfall due to the clash of southwest monsoonal winds with the westerlies that resulted in massive floods particularly in the 05 northern districts (Figure 1); Rudraprayag, Uttarkashi, Chamoli, Bageshwar and Pithoragarh [7-13]. Of these, Rudraprayag was the worst affected district and the floodwaters caused massive loss of human lives besides damage and destruction of infrastructure and property, particularly in the Mandakini valley that houses Kedarnath shrine which is highly revered by Hindus [12, 13].

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The floods disrupted all tourism and pilgrimage related activities as the National Highway connecting Rudraprayag and Chamoli districts remained closed for a long period (Table 1). Moreover, fear psychosis created by the death of more than 4000 persons desisted people from venturing to the region for a long time which is evident from sharp decline in the number of people visiting Kedarnath even after one year of the disaster (Table 2). This resulted in substantial reduction in the income of the people of the area engaged in various pilgrim and tourist related activities and business.

**Table 1.** Disruption of surface connectivity along NH 58 and NH 109 connecting Rudraprayag and Chamoli districts after 16-17 June, 2013 disaster. Data source: *State Emergency Operations Centre, Department of Disaster Management, Government of Uttarakhand.*

Sl. No.	Highway	Days for Which the Connectivity Was Disrupted					Surface Connectivity Disruption (In %)
		June (30 days)	July (31 days)	August (31 days)	September (30 days)	Total (122 days)	
1.	Rishikesh Badrinath (NH 58)	15	20	17	13	65	53.3
2.	Karnaprayag – Kedarnath (NH 109)	13	21	18	13	65	53.3

The disaster of June, 2013 was highly publicized by the media and galvanized by the sufferings of both local people and ones stranded due to the incidence at different places there was massive inflow of relief material to the affected area. This paper is an attempt to analyze the state of replenishment of productive assets lost in the disaster and impact of relief on the economy of Rudraprayag district.

**Table 2.** Number of persons visiting Kedarnath in the period 2011 – 14. Data source: *Uttarakhand Tourism Development Board, Dehradun.*

MONTH	2011	2012	2013	2014	DECREASE IN 2014 (IN%)
MAY	2,45,821	2,98,182	1,49,689	13,823	94.0
JUNE	2,49,386	1,96,830	1,82,551	14,091	93.3
JULY	29,216	27,712	-	3,041	89.3
AUGUST	11,759	11,496	-	944	91.9
SEPTEMBER	20,746	12,823	-	3,796	77.4

## 2. Disaster relief in India

Insurance is often considered an effective tool of post-disaster economic recovery [14, 15]. It however does not have significant penetration amongst the masses in India, particularly in the rural areas where majority of the population resides [16]. On the aftermath of a disaster the affected population, having lost its productive assets and left with little resources to face the situation, therefore looks upon the state for assistance. Keeping with the spirit of a welfare state there exists an institutional arrangement of providing relief to the disaster affected population.

Financial receipts in the central government exchequer in India are earmarked for expenditure under various heads, and also shared with the provincial governments in accordance with the recommendations of the Finance Commission that is set up every 05 years in accordance with Article 280 of the Constitution of India [17]. In accordance with the recommendations of the previous Finance Commissions and Sections 46 and 48 of the Disaster Management Act - 2005 [18], resources for disaster related contingencies are allocated under National and State Disaster Response Funds (NDRF/SDRF) for central and provincial governments.

In the event of a notified natural calamity the affected provincial government utilizes the funds available under SDRF for providing relief to the disaster victims. Though generally provided in cash, attempts are underway to transfer it directly to the bank account of the beneficiaries. The quantum of relief for the identified losses is in keeping with the notifications to this regard by the Ministry of Home Affairs, Government of India. As indicated clearly the relief is not intended to compensate the loss suffered by the individuals and is only for immediate sustenance of the affected population. The relief amount therefore has no direct relationship with the economic value of the assets lost in the disaster. Moreover, relief out of SDRF is not provided for the loss of commercial assets as the ones managing commercial enterprises are expected to take resort to suitable risk transfer mechanism on their own.

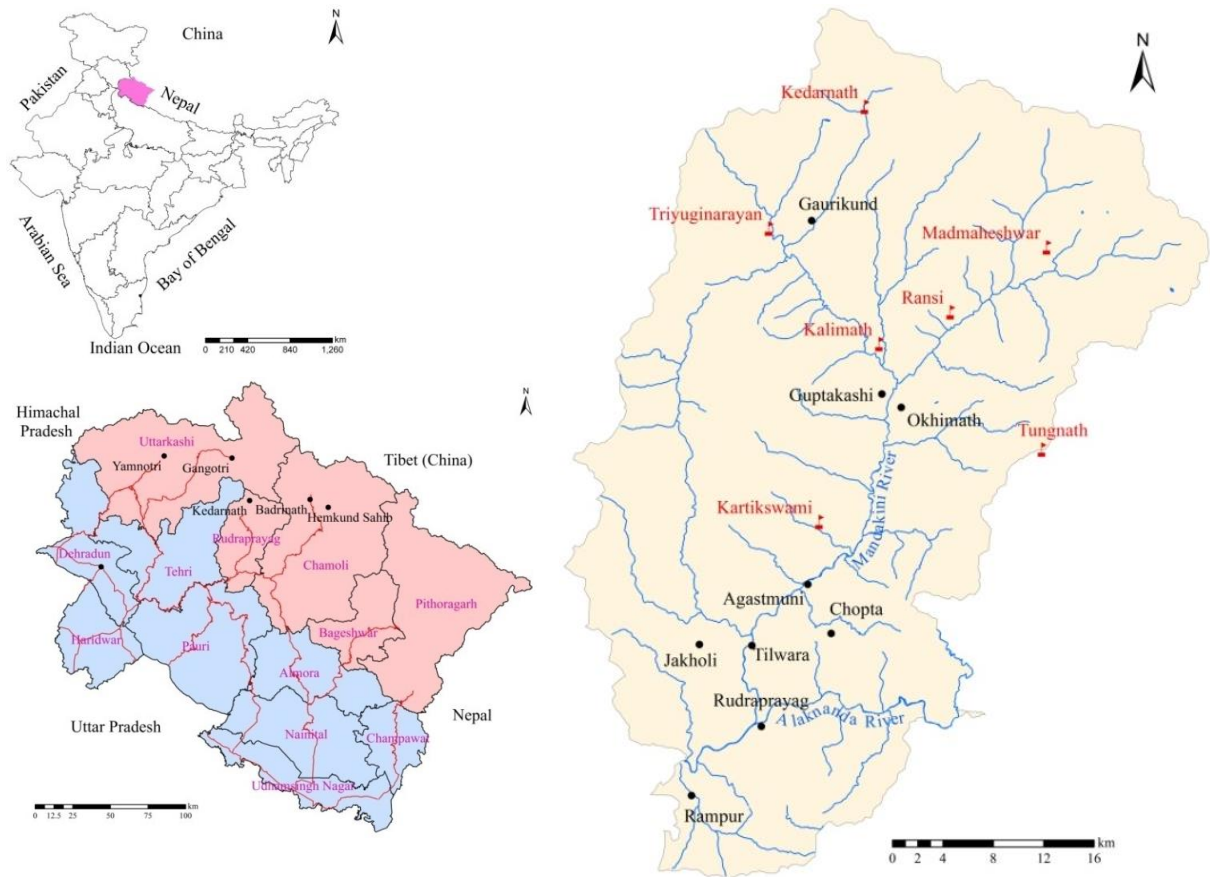
The relief is however much less than the market price or cost of replenishment of the assets lost due to disaster. Owing largely to other related post-disaster contingencies and familial requirements, the disaster affected families often end up utilizing the relief amount on non-productive expenses which has adverse impact on the quality of life of the disaster affected population.

### **3. Materials and Methods**

#### ***3.1 Study area***

Rudraprayag district has a population of 2,42,285 of which 52.77% are females. 95.9% population resides in its 653 villages and the workforce constitutes 46.7% of the population of which 76.4% is engaged in agriculture [16]. Rudraprayag, the headquarter of the district is located at the confluence of Alaknanda and Mandakini rivers.

Apart from the district headquarter Agastmuni, Okhimath, Guptkashi and Tilwara are other urban areas while Kedarnath, Kartikswami, Kalimath, Madhyamaheshwar, Ransi, Trijuginarayan, Tungnath and Onkareshwar (Okhimath) are major Hindu shrines attracting people from across the country in large numbers (Fig. 1). Most shrines remain snowbound during the winters and are accessible between May – June to October – November. These are visited by people in large numbers before the onset of monsoonal rains as that period coincides with summer vacations in the schools and visiting the mountains provides people solace from scorching heat of the plains. Moreover, this period is generally rain free and thus the visitors do not have to face inconvenience caused by landslide induced traffic disruption.



**Figure 1.** Map depicting study area (Right), five flood affected districts of Uttarakhand depicted in red color (lower left) and Uttarakhand in the map of India (upper left).

### 3.2 Data collection and Survey

Particulars of the individuals who lost their productive assets and relief provided were collected from the local administration. Details of the relief amount, distribution strategy and problems encountered in distribution were gathered through interactions with the officials of the local administration. This information was utilized for planning the coverage of the study ensuring fair representation of the entire district. A total of 417 disaster affected families were covered by this study (Table 3). Semi-structured questionnaire and focused discussions were used for assessing the impact of disaster and utilization pattern of the relief.

**Table 3.** Number of respondents under each category of losses covered under the study.

SL. NO.	LIVELIHOOD ASSET	RESPONDENTS
1.	Livestock	156
2.	Agriculture land	102
3.	Petty business	65
4.	Medium and large business	94

#### **4. Impact on livelihood assets**

For the purpose of present study productive assets were classified into livestock, agricultural land and business assets. Of these relief out of SDRF is admissible for the loss of livestock and agricultural land only. In view of the severity of June 2013 disaster provision of relief was however made for some commercial assets by the provincial government out of Chief Minister Relief Fund. Repayment of the loans was also deferred and both electricity and water dues of the commercial establishments were waived off.

In order to better understand the impact of disaster on the quality of life and spending pattern of relief amount a semi-structured questionnaire was utilized for gathering the relevant information from the affected population. Focused discussions were also organized for assessing the perception of the people on related issues.

##### **4.1 Livestock**

Animal rearing was mainstay of the economy of the region and these were utilised for cross border trade with Tibet. Though the animal stock has depleted sharply since the closure of trade after Sino-Indian conflict of 1962, animal rearing still remains a major economic activity in the hills, and substantiates household income besides enriching the food.

The livestock commonly reared by the masses in the area includes cow, ox, goat, sheep, horse and mule. Cow and goat provide milk products and meat respectively while ox is utilized for agricultural purposes. Compared to these horse and mule are put to direct commercial use and utilised for transporting people and supplies as also construction material along various trekking routes and also to villages not connected by road. Large population of the area is engaged in these activities that revolve around various pilgrim and tourist destinations, which include Kedarnath, Kartikswami, Madhyamaheshwar, Ransi, Trijuginarayan and Tungnath. This is a major source of income for these people.

156 families that had lost mules and horses were covered by the present study. Of these 33.3% had lost one animal while the others had lost two. No one had insured the animal and this was attributed to lack of information. All the families received relief of Rs. 50000 for the loss of one animal and this amount included the relief admissible out of SDRF. Market price of mule and horse being significantly higher 75.6% respondents were not satisfied with relief amount and 78.2% favoured replenishment of assets lost in disaster rather than cash relief.

In order to continue the livelihood 52.6% purchased a mule after the disaster and for this 30% resorted to borrowing. Not familiar with institutional financing 66.7% had to however manage loans from friends and relatives. Being peak of the pilgrim season most persons capable of handling the mules and horses were in the Mandakini valley when the disaster took place and many of these perished in the incidence. 38.9% of the families not replenishing the animal had lost the family members engaged in this activity and there was no one in the family who could continue the engagement with the animals.

With disrupted tourist and pilgrim activities most households were left with no source of income and therefore another 38.9% could not replenish the lost animal as the relief amount had to be spent on routine household expenses. Age and psychological fear of venturing into the Mandakini valley were the reasons for 5.6% each to discontinue this profession.

47.4% respondents spent the relief amount on routine non-productive household expenses. Only 7.7% consulted other family members before making the spending decision and as the head of the family they did not consider it necessary. With only 13.5% investing the relief amount on the creation of alternative productive assets others repented their decision to spend the relief amount on non-productive purposes.

The people do realize the importance of insurance and accept that they would have received a better deal had their animals been insured. They also accept that their region is vulnerable to disasters and can be affected again in future. Insignificant proportion of the respondents however agreed to insure their animals and inability to pay the premiums on a regular basis was put forth as the main reason thereof.

#### ***4.2 Agricultural land***

Even though agriculture is the mainstay of the economy of the province most landholdings, particularly in the hilly region that comprises ~86.1% geographical area of the province, are small and marginal - less than 2 hectares. These are at the same time rainfed and fragmented - scattered over large area. Moreover, the agricultural terraces developed over the hill slopes are vulnerable to being overrun by landslide debris and instability induced by toe erosion by rivers and streams.

Of the families losing significant proportion of their agricultural land due to disaster, 102 that were largely dependent on agriculture were selected for the purpose of present study. Of these only 21.6% utilized the relief amount for the purchase of agricultural land at an alternative place and for the repair and upkeep of the damaged fields.

33.3% respondents availed loans on the aftermath of the disaster of 2013 but only 16.7% each took loan for agricultural operations and starting new business, while the majority (55.6%) took loan for the construction of house or for other non-productive purposes. Loan was availed from formal financial institutions by 61.1%.

As regards utilization of relief amount received for the loss of agricultural land, 21.6% utilized it on the repair and reconstruction of their house that was damaged by the disaster while 51.0% spent it on routine household expenses.

All the respondents were unanimous over relief amount being much less than prevailing market rate of land in the area and this was put forth as the main reason for not purchasing land. No respondent was therefore satisfied with the relief and all were unanimous that instead of cash relief the state should provide land equivalent to that lost in the disaster.

As assessed, the disaster has weakened economic state of all the respondents and it is attributed to (i) loss of land, (ii) inability to purchase land in lieu of the lost land, (iii) lacking investment on other income generating assets, and (iv) savings having spent on routine household expenses. All the responders accepted that the region could be affected by disasters in future as well but were reluctant to insure their agricultural land. Recurring payment of premium seemed a major economic burden to almost all.

#### ***4.3 Petty business***

Agriculture in the hills being subsistence type, most families substantiate their household

incomes through allied activities - animal rearing, temporary menial jobs and involvement in tourism and pilgrimage related activities [19, 20]. Apart from this a number of persons operate commercial vehicles and work in the hospitality sector in various capacities while some are engaged in small business of their own. All these activities ensure cash flow so as to fulfill non-farm family requirements.

65 persons engaged in small business were covered by this study. These were mostly tea and food stall operators and persons selling various other items to tourists and pilgrims by the road side, as also along the foot trek between Gaurikund and Kedarnath. Average monthly income of these persons ranged between Rs. 4,000 and 8,000. They however earned much higher amount during the tourist season. Till the disaster of 2013 all the familial household expenses of these persons were being met from this activity.

Of the persons included under the survey 61.5% incurred loss of business infrastructure and supplies during the disaster while the rest were forced to close the business as there was significant decrease in the number of persons visiting the area (Table 2).

A major habitation, Rambara, located on the foot trek from Gaurikund to Kedarnath was totally wiped out in the floods of 2013 [8,11,13] and subsequently the foot trek was aligned along the left bank of Mandakini. The persons operating along the old foot trek on the right bank of Mandakini were thus left with no option but to close their business.

62.5% respondents were assessed as being eligible for relief and operating business on public land was the main cause of disallowing relief to the others. The relief amount was however spent on routine household expenses, as these persons were left with no other source of income after the disaster.

Only 46.2% respondents started the business again in 2014 – 15. Widening of the road, loss of land, realignment of the foot trek and lack of money were the main reasons for not continuing with the profession. The persons discontinuing their business were working in the construction industry as daily wage earners.

No one resorted to loan of any sort for restarting the business. Economic condition of all was worse compared to 2013 and they had spent whatever little savings they had for meeting routine household needs. As expected, all the responders expressed inability to pay the insurance premium as their income was not significant.

#### ***4.4 Medium and large business***

94 medium and large business establishments spread across the district were covered under the present study. Except for 3.2% others were doing good business till the time of 2013 disaster and their monthly income ranged between Rs. 4,000 to 4,00,000.

All were unanimous that their business was adversely affected by the disaster of 2013; 43.8% attributed this to reduced demand due to disrupted connectivity, 20.8% to migration of people after the disaster and thus reduced buyers, 18.8% to disaster induced loss of business infrastructure, 9.4% to people buying on credit going missing and 7.3% to disrupted supply chain. Due to reduced income respondents were finding it hard to repay their loans. The recovery being long drawn most respondents had spent their savings in managing routine household affairs.

Being located at relatively safe places business establishments of most respondents were saved from direct impact of the disaster. Moreover, with steady income over long time the respondents had appreciable savings that helped them overcome business disruption. Continued dealings with the financial institutions helped them access loans to further strengthen and diversify their business. 30.9% respondents resorted to loan from different financial institutions after the disaster of 2013 for strengthening their business and average loan amount was Rs. 3,70,000.

This category was therefore not affected significantly by the disaster. The impact on business was assessed as being severe by 63.9% and moderate by 16.9%.

37.2% respondents agreed to insure their business assets. Of these assets of 42.9% were however already insured. Minimal impact on the business assets seemed to deter the majority from insuring their business.

## 5. Discussion and Conclusion

In the year 2013 Uttarakhand witnessed a major disaster and Rudraprayag was amongst the worst affected districts. Routine income the people engaged in almost all vocations witnessed sharp decline on the aftermath of the disaster that is attributed to disruption in tourism and pilgrimage related activities. This forced people to spend significant proportion of their savings on routine household expenses and except for medium and large business operators all others were left with no savings to bank upon in future.

The disaster caused massive loss of productive assets of the people - livestock, agriculture land and business assets. The impact as brought out by the study was worst on the ones representing lower socio-economic strata of the community and engaged in petty business. Majority of these persons were operating their business informally and on public land. They were therefore treated as encroachers and not provided relief. Otherwise also, their routine turnover was not significant and they had limited savings. With reduced or no income, they spent whatever little savings they had and were left with no other option but to work as daily wage earners to make the ends meet. Moreover, these persons had limited interaction with formal financial institutions and therefore they could not get financial support to restart their business.

Except for the families that lost the persons engaged in the activity together with ones deciding to discontinue the profession for personal reasons, most households engaged in ferrying tourists, pilgrims and supplies purchased the lost asset. The relief amount being far less than the replenishment cost or market price of the animal, a number of families resorted to loan while the others utilized their household savings to bridge the gap. Like petty business operators this group, representing lower social strata of the community, could not assess institutional financial support and had to resort to loan from friends and relatives.

The difference between market price of land and relief amount being exorbitant, only a few families dependent solely on agriculture could purchase the land in lieu of that lost in the disaster. These families however had assessed to formal financial institutions and availed loan for other purposes; particularly for construction of house.

Due to the inbuilt resilience the persons operating medium and large business managed to overcome the situation relatively easily. Though this group witnessed a lean period in their business after the disaster of 2013, their assets were largely unaffected as these were well built



and located at relatively safe places. Moreover, this group also had assets and savings to tide over the lean period. Regular interaction and dealings with financial institutions together with their socio-economic status helped them avail institutional financial support for strengthening and diversifying their business.

Disaster induced loss of productive assets and their non-replenishment due to various reasons is observed to be a major hurdle in economic recovery particularly for petty business and other small-time operators. It is brought out by the study that a large proportion of the persons fail to recover from the impact of the disaster and the quality of their life deteriorates perpetually as is evident from large proportion of the petty business operators working as daily wage earners.

Relief is generally not provided by the state for the loss of business assets due to disaster and even where it is provided in some exceptional circumstances it is not enough for the replenishment of the lost assets. This has adverse impact on the livelihood strategy and quality of life of the affected population, particularly the ones engaged in petty and small business.

It would however not be feasible for the state to provide relief for the loss of business assets and insurance is the most viable option for ensuring post-disaster economic recovery. With small business operators that are often the hardest hit by disaster incidences, not in a position to purchase available insurance cover the state needs to conceive, design, promote and subsidize suitable risk transfer instruments to ensure coverage of all engaged in business. This could be done by making insurance an essential condition for operating any business.

Even though relief is provided by the state for the loss of agricultural land and farm animals the affected families fail to replenish the lost asset due to high market price of these. Moreover, due to reduced income in the post-disaster phase most relief amount is spent on nonproductive and familial requirements.

Loan linked replenishment of productive assets lost in disaster through suitable linkages with financial institutions and discontinuing the current practice of providing cash relief for the loss of productive assets could be a viable solution to this problem. Moreover, as has been highlighted by some studies cash relief after a disaster depresses economic growth [21] and therefore the state should focus on the replenishment of lost assets. While replenishing productive assets state also needs to ensure that the assets being created are insured with a provision of premium deduction for a long duration at one go at the very beginning.

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### **Author Contribution**

SK undertook fieldwork in the affected area and collected the data through interaction with different stakeholders. PR designed the questionnaire, analysed the data collected and prepared the manuscript.

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