

**EXECUTIVE SUMMARY OF THE MAJOR RESEARCH PROJECT**

1. TITLE OF THE PROJECT: **“Exploring the Dynamics of Vulnerability to Natural Disaster for Sustainable Hazard Mitigation: The Case of 2013 Flood-Hit Uttarakhand”**.
2. NAME AND ADDRESS OF THE PRINCIPAL INVESTIGATOR: Dr. Pradeep Kumar Parida, Department of Sociology, Pondicherry University, Puducherry – 605014
3. NAME AND ADDRESS OF THE INSTITUTION: Pondicherry University, Kalapet, Puducherry – 605014, India.
4. UGC APPROVAL LETTER NO. AND DATE: **UGC FILE NO.F.NO.5-370/2014 (HRP), Dated 5/10/2015.**
5. DATE OF IMPLEMENTATION : **1/07/2015**
6. TENURE OF THE PROJECT : **1/7/2015 to 30/6/2018**
7. TOTAL GRANT ALLOCATED : **Rs. 12,61,406/-**
8. TOTAL GRANT RECEIVED : **Rs. 11,56,026/-**
9. FINAL EXPENDITURE : **Rs. 12,48,710/-**
10. **BALANCE AMOUNT TO BE RELEASED BY THE UGC : Rs. 92,684/-**
11. TITLE OF THE PROJECT: **“Exploring the Dynamics of Vulnerability to Natural Disaster for Sustainable Hazard Mitigation: The Case of 2013 Flood-Hit Uttarakhand”**.

**12. OBJECTIVES OF THE PROJECT:**

- f) What is known about the issue of social vulnerability and flood disaster in the Himalayan state of Uttarakhand?
- g) How do people respond to flood events and what is the extent of their resilience?
- h) How is the socio-economic status of vulnerable population impacted through the disaster cycle?

- i) What are the Government's regulation and policies in relation to flood disaster management in Uttarakhand?
- j) What factors can be suggested to identify new policy directions?

**13. WHETHER OBJECTIVES WERE ACHIEVED: YES, Fully**

**14. ACHIEVEMENTS FROM THE PROJECT:**

Natural disasters are killing thousands of people in the space within few minutes apart from destroying ecological and social systems. The post-disaster effects are enormous over successive weeks and years. However, the fact of the matter is that many of the deaths and much of the damage and destruction is preventable following a disaster. This project helped me to explore into an unexplored areas of research – the “unprecedented” floods of 2013 Uttarakhand where I could see the trauma and agony of the flood-affected people who struggled on a daily basis due to the unfolding of regular disasters. My biggest achievement was that I was able to collect detailed information of various factors the led to the disastrous flood of 2013 in Uttarakhand. So, I am thankful to the UGC for its generous funding; otherwise, it would have been a Herculean task to reach at the population who are at risk. I have published two papers out of this project which showed how to implement sound disaster management laws and policies for the development of more resilient societies. Further, given the varying hazards and disasters setting in recent years, this research helped recognizing of various threats and offered a foundation for more efficient risk reduction endeavors in vulnerable communities throughout the country. In particular, it was a huge prospect for developing additional knowledge in a disaster society. The report presented a basis for planning future social science disciplinary, multidisciplinary, and interdisciplinary research and application activities with regard to the threat of natural disasters.

**15. SUMMARY OF THE FINDINGS:**

Uttarakhand, the “land of Gods” (*Devbhumi*) lies between  $28^{\circ} 43'$  and  $31^{\circ} 27'N$  and  $77^{\circ} 34'$  to  $81^{\circ} 2'E$  faced “unprecedented” torrential downpour and subsequent flooding from June 16 to 17, 2013. The flood fury inflicted unparalleled destruction and mayhem after swallowing vast areas of Uttarakhand state. The rainstorm, heavy rainfall and subsequent landslides were no doubt natural disasters but the catastrophe in various parts of Uttarakhand was primarily recognized as a man-made. In this backdrop the main aim of this project was to explore the

factors responsible for high human deaths and loss of resources. The main objectives were to understand the socio-economic status of vulnerable population impacted through the disaster cycle and to examine how people responded to the flood events. The findings revealed that in a mountainous and hilly state like Uttarakhand, a disaster became unavoidable in the milieu of a historically constructed outline of vulnerability, evidenced in the location, infrastructure, sociopolitical organization, production and distribution systems, and ideology of a society. Data signified that the unprecedented flood's fury and disastrous impact was due to society's pattern and dynamics of vulnerability. In the study area, the dynamics of vulnerabilities was significantly visible in terms of broad-ranging social, economic, and physical relationships in combination with the natural forces that created a disaster of unprecedented nature. The report made it clear about various patterns of vulnerability which was characterized by factors like geographic location, preexisting infrastructure, sociopolitical organization, production systems, distribution structures, and societal ideology. The report reiterated that poverty, as a reflection of economic and political forces generated an unequal distribution of resources and power as a result increased vulnerability of the victims.

Respondents revealed how successive state governments since the formation of Uttarakhand as a separate state encouraged an economic growth model that totally ignored the state's mountain nature and the linked environmental frailties. They have persistently supported deforestation, dams on large and small rivers, lengthy tunnels inside fragile mountain slopes, construction of road, hotels and resorts by riversides and massive sand mining of river beds. In other words, human actions aggravated natural hazards to generate increased risk and vulnerability. In this context, the socio-economic and demographic profile of mass mortality victims provided knowledge about biological and social aspects of risk and vulnerability. Since catastrophes have such disturbing and shocking effects on the communities, comprehending victim's demographics provided information relevant to community recovery.

In similar with Blaikie et al. (1994), data demonstrated that the poor and wealthy, women and men, young and old, and people of diverse social identities as well as political establishment faced different risks while encountering the same floods in Uttarakhand. Data confirmed that these different outcomes were due to the place-based, social and political-economic circumstances.

Importantly, this research indicated that vulnerability is produced by on-the-ground social inequality, unequal access to resources, poverty, poor infrastructure, and lack of representation, inadequate systems of social security, early warning, and planning. These factors made some susceptible to any kind of disasters. To be specific, data showed that marginalized respondents

who had the least possession of economic savings, nationally recognized educational and occupational credentials, and ties to national businesses faced the brunt of disaster more than the middle-class people who were economically self sufficient individuals. Data showed that respondents of higher socioeconomic status performed better after the floods than lower income people. People of higher socioeconomic status faced less job loss and experienced fewer fluctuations in their income following the floods. People of lower socioeconomic status had much more difficult time recovering their pre-impact economic status than similarly affected middle-class residents. Many of them (98%) countered job loss while others lost months of significant wages because they found difficulty to go to their hourly paid jobs for days or weeks after the floods. 95% of respondents of lower socioeconomic status depended more upon catastrophe support programs to help them regain their pre-impact economic status. Unfortunately, 90% lower income people found difficulty in qualifying for, accessing, or negotiating disaster assistance programs. I have also made an attempt to see the gendered terrain of 2013 floods at Uttarakhand. Data explained that financial disadvantage, inadequate access to resources, reliance on male family members, and limited power in decision making contributed to women's and aged women's vulnerability to the floods. This was significantly amplified at the time of floods as a result these groups faced severe brunt of the floods. In conclusion, the report recommended various suggestions, for instance, following ecologically responsive development, sustainable and safer infrastructure development and disaster preparedness for disaster risk reductions after discussing the Government's present policy towards disaster risk reduction in the fragile eco-system of Uttarakhand.

## **16. CONTRIBUTION TO THE SOCIETY:**

The benefits of this project are many. Since floods are regularly affecting the people of hilly areas of India, knowledge from the historical understanding of how societies cope with floods offered valuable insights into the problems created by the threat of natural disasters. In the course of our in-depth research, we explored the causal structure of vulnerability in a hilly and mountain area like Uttarakhand for developing a broad flood vulnerability reduction strategy. The socio-economic and demographic profile of victims provided knowledge about biological and social aspects of risk and vulnerability. Since catastrophes have such disturbing and shocking effects on the communities, grasping victim's demographics provided information relevant to hilly and mountainous community recovery.

This study provided foundation for creating recommendations for local policy issues. Further, thorough vulnerability analyses, it was easy to indicate the need to reform the larger

political economy of institutions, policies, social hierarchies and practices that shaped well-being, capacity for self-protection and entitlements. This research has recommended that understanding a particular set of dynamics and opportunities for vulnerability reduction in a particular geographical area like Uttarakhand is the need of the hour if we want disaster risk reduction and sustainable hazard mitigation. The findings and results of this project report also revealed that flood disaster risk reduction and sustainable hazard risk reduction is possible when investigations of vulnerability and susceptibility reflect on local people's needs and desires and concentrates on their knowledge of political-economic and social context in which any policy becomes into law and translates into practice.


Since there is abnormal and irregular change in weather, development actions like hydropower projects in an ecologically fragile zones like Uttarakhand should be cautiously planned and development must be socially and environmentally sustainable. Thus, given the varying hazards and disasters setting in recent years, this research helped recognizing various threats and offered a base for more efficient risk reduction endeavors in vulnerable communities. The report, therefore, presents a basis for planning future social science disciplinary, multidisciplinary, and interdisciplinary research and application activities with regard to the threat of natural disasters.

**17. WHETHER ANY PH.D. ENROLLED/PRODUCED OUT OF THE PROJECT: NO**

**18. NO. OF PUBLICATIONS OUT OF THE PROJECT: 2 (TWO)**

**(Please See the Attachment)**

3. **Parida, P.K.** (2016) "Understanding the Elderly in Natural Disaster: Need for Comprehensive Disaster Planning", *Research Process*, Vol. 4, No. 1, pp. 51-62.
4. **Parida, P.K.** (2015) "Natural Disaster and Women's Mental Health", *Social Change*, Vol. 45, No. 2, pp. 256-275 (**Sage Publications**).

  
**(PRINCIPAL INVESTIGATOR)**  
**(Seal)**  
5.10.18

  
**(REGISTRAR)**  
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