

# **Relief Camp Amenities and Household Satisfaction: Evidence from Kavalappara Landslide Survivors, Kerala, India**

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## **Abstract**

*Landslides pose significant challenges to human life and livelihoods particularly in vulnerable regions like Kerala. Relief camps serve as a critical immediate response mechanism providing shelter and essential support to affected populations. This study examines the adequacy of amenities and household satisfaction in relief camps following the 2019 Kavalappara landslide in Malappuram district. Based on primary data from 85 affected households, the study evaluates facilities and services such as food, water, sanitation, electricity, medical and emotional support, and space availability in relief camps. An adequacy index was constructed using a five-point scale. The findings indicate that essential services like food, clothing, water, and electricity were highly adequate, reflecting an effective emergency response. However, aspects related to comfort and well-being including sanitation, space, and psychosocial support, were only moderately adequate. While most households expressed overall satisfaction, the results highlight the need for more human-centered and quality-oriented relief planning.*

**Keywords:** *Relief camps, Landslides, Adequacy index, Household satisfaction, Disaster recovery, Kerala*

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## **I. Introduction**

Natural disasters remain as one of the most severe challenges confronting human society across the globe. Among the various types of natural disasters, landslides are the most devastating in terms of their impact, spatial concentration, casualties and irrevocable disruption of the social and economic fabric of communities affected. Landslides, defined as the downward movement of rock, soil, or debris, are often triggered by natural factors such as intense rainfall, seismic activity and volcanic eruptions as well as human-induced causes like deforestation and poorly regulated construction at ecologically fragile zones (Smith et al., 2023). In a demographically crowded country like India, the consequences of such disasters are more severely felt in the North East and the Western Ghats region. Kerala, the southernmost state bordering Western ghats, frequently experience landslides during the monsoon season resulting in a significant loss of life, destruction of property and community displacement. The landslides in different locations in Kerala during 2018 floods, resulted in over 100 casualties and the destruction of thousands of homes (National Disaster Management Authority, 2019). The much recent landslides in Kavalappara, Malappuram (2019), Pettimudi, Munnar (2020) and Mundakkai, Wayanad (2024) resulted not only in the tragic loss of hundreds of lives but also left a profound impact on the livelihood of affected communities thereby aggravating the existing poverty and socio-economic disparities.

Disaster relief camps occupy a central position in the continuum of emergency response and recovery (Yore et al., 2025). Those households they were affected by landslides could move forward without the support of others and the society. The survivors went through such a traumatic condition could bring back to normalcy through providing better facilities and warmth at the relief/shelter camps. These temporary living arrangements usually exist for several weeks to several months, depending on how long it takes to find more normal living arrangements. The households would continue to remain in relief camps until they get a temporary housing arrangements before formal rehabilitation. These places can provide temporary sleeping spaces to hundreds of human beings and usually it is arranged at school buildings, community buildings or in religious institutions. The quality of services and facilities offered at the relief camps is an important component in disaster recovery and is a critical window during which the quality of support provided can significantly influence long-term recovery outcomes. (Tierney, 2019; Gioli, Jain, & Maiti, 2021).

So, this paper aims to understand the adequacy of amenities and essential services arranged at the relief camps for the landslide affected survivors of kavalappara landslide which happened in 2018 in Kavalappara, Malappuram district, Kerala. The adequacy and quality of basic services provided at the relief camps and the level of satisfaction among the survivors are also considered in the paper.

## II. Kavalappara Landslide, Malappuram District, Kerala

The tragic event known as the Kavalappara Landslide occurred at approximately 7:30 p.m., Aug 08, 2019. The incident unfolded on the north-facing Muthappankunnu slope, engulfing the region in a devastating cascade of earth and debris. Witness accounts detailed heavy rainfall preceding the event, accompanied by an eerie sound reminiscent of a helicopter, amplifying the sense of impending disaster (Vasudevan, N., et al., 2021). Initial analysis, informed by local testimonies and on-site investigations suggests that the landslide was triggered by a planar failure occurring at the interface between overburden and rock formations. The toll of the Kavalappara Landslide was profound, claiming the lives of 59 individuals. The physical impact was extensive, with 98 houses either partially or completely demolished by the force of the landslide (Sarun, S., et al.2021). Nearly 250 households in the nearby areas are rehabilitated temporarily to the relief camps arranged by the local self-governments.

## III. Methodology

For this study, eight five landslide affected households were randomly selected from Kavalappara. Pothukallu Panchayath. These households were severely affected by the landslide and shifted to the relief camps and later rehabilitated by the government and other humanitarian agencies. A questionnaire was prepared to understand the adequacy of essential service and facilities were arranged at the relief camps. It includes the evaluation of availability of food, clothing, bedding, sanitation facilities, space for each individual, mental health support etc. Quantitative analysis of these services can provide a more objective and data-driven understanding of the conditions in relief camps and help evidence-based decision-making in disaster recovery in future. An index was created based on the responses collected from the sample population.

## IV. Results

The following section analyses the adequacy of basic services arranged at the relief camps.

**Table 1:** Percentage wise analysis of availability and adequacy of basic services at the relief camps for landslide survivors in Kavalappara (N-85)

Amenities / Facilities	Not at all adequate	Slightly adequate	Moderately adequate	Very adequate	Extremely adequate	Total (%)
Availability of food	0.0	0.0	0.0	42.4	57.6	100
Provision of clothing	0.0	0.0	1.2	44.7	54.1	100
Provision of Bedding	0.0	8.2	49.4	36.5	5.9	100
Availability of clean Water	0.0	0.0	11.8	70.6	17.6	100
Provision of Sanitation facilities	0.0	5.9	40.0	47.1	7.1	100
Provision of adequate electricity	0.0	1.2	11.8	63.5	23.5	100
Medical & Emotional Support	0.0	7.1	50.6	37.6	4.7	100
Space Availability for each individual	0.0	9.4	58.8	29.4	2.4	100

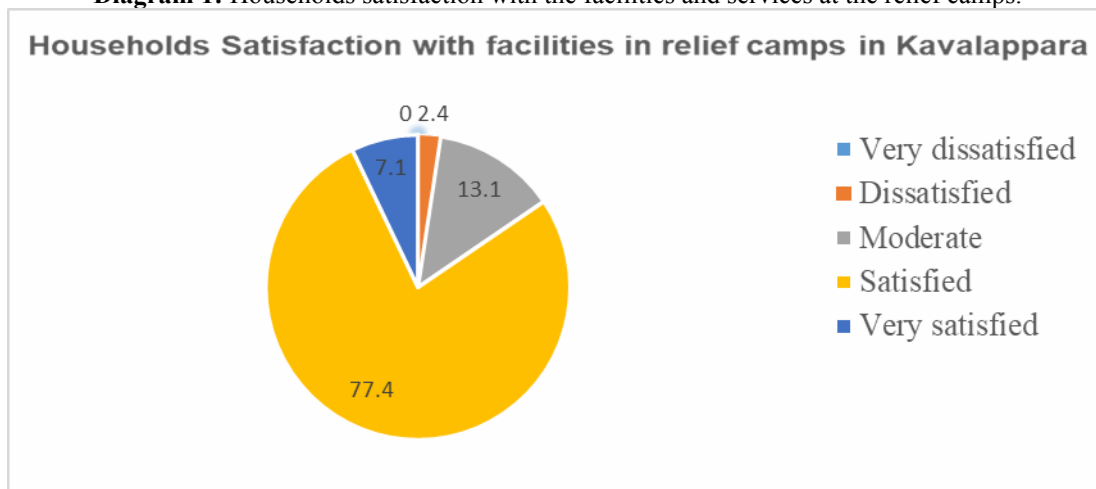
Table 1 presents the distribution of households' perceptions regarding the adequacy of various amenities provided in relief camps in Kavalappara. The findings indicate that essential services such as food, clothing, clean water, and electricity were perceived to be highly adequate by the majority of respondents with a large proportion rating them as either very adequate or extremely adequate. This reflects the effectiveness of relief efforts in addressing essential survival needs during the immediate recovery phase. However, a different pattern emerges for facilities related to living conditions and well-being. Amenities such as bedding, sanitation, medical and emotional support as well as space availability were predominantly rated as moderately adequate. In particular, space availability and medical support show relatively higher proportions of moderate and slightly adequate responses reflecting certain constraints in ensuring comfort, privacy and psychosocial care within the camps. Overall, the results highlight that while relief camps in Kavalappara were successful in providing essential resources, there were noticeable gaps in aspects that contribute to longer-term comfort and dignity.

**Table 2:** Amenity wise adequacy index of relief Camps in Kavalappara (N-85)

Amenities / Facilities	Mean Index Score	Rank	Gap from Maximum Score
Food	4.58	1	0.42
Clothing	4.53	2	0.47
Electricity	4.09	3	0.91
Clean Water	4.06	4	0.94
Sanitation	3.55	5	1.45
Bedding	3.40	6	1.60
Medical & Emotional Support	3.40	7	1.60
Space Availability	3.25	8	1.75

The Index was constructed using weights such as 1 = Not at all adequate, 2 = Slightly adequate, 3 = Moderately adequate, 4 = Very adequate, 5 = Extremely adequate. Higher score indicates better adequacy and gap indicates shortfall from the ideal condition. The composite adequacy index for Kavalappara relief camps was 3.86 indicates that the overall provision of amenities was moderately high. Essential services such as food (4.58), clothing (4.53), electricity (4.09) and clean water (4.06) were rated highly adequate reflecting effective immediate disaster response. However, facilities related to human comfort and well-being such as bedding (3.40), sanitation (3.55), medical and emotional support (3.40) and space availability (3.25), were only moderately adequate. The gap analysis further reveals that space availability remains the most critical concern indicating overcrowding and the need for improved camp planning. This suggests that while survival needs were effectively met, comforts and psychosocial support require greater policy attention.

**Diagram 1:** Households satisfaction with the facilities and services at the relief camps.



When the survivors of the Kavalappara landslide were asked how they felt about the facilities and services provided at the relief camps, their responses highlighted an encouraging picture. An overwhelming 77.4% of households said they were satisfied with the facilities - a testament to the considerable efforts made by local governments, NGOs, and community organizations in delivering basic services under difficult circumstances. A further 13.1% described their experience as moderate suggesting that while their needs were broadly met, there was still room for improvement in certain areas. A smaller but meaningful 7.1% reported being very satisfied, reflecting the experiences of those who felt genuinely cared for during one of the most difficult periods of their lives. On the other end, 2.4% expressed dissatisfaction, and notably, none described themselves as very dissatisfied. These figures suggest that for the vast majority of families who lost everything in the Kavalappara landslide, the relief camps provided not just a roof and a meal, but a genuine sense of support and safety. But a combined 15.5% reminds that there is a room for improvement in delivering basic services to the survivors at the relief camps.

### V. Discussion

The findings of the study offer an important insight into the dual nature of disaster relief interventions where efficiency in meeting immediate survival needs coexists with constraints in ensuring dignity, comfort and psychosocial well-being. The high adequacy scores for food, clothing, water, and electricity clearly indicate that the institutional response in Kavalappara was prompt, organized and largely successful in addressing the urgent necessities of displaced households. However, the relatively lower scores for bedding, sanitation, medical and emotional support and especially space availability point to a critical gap in disaster recovery. The moderate ratings in these dimensions suggest that while people were physically sustained, their lived experience within the camps involved compromises in privacy, comfort, and emotional care. This is further reflected in the

satisfaction levels where a majority expressed satisfaction, yet a significant proportion indicated only moderate satisfaction emphasising need for further improvement in relief camp services. The Kavalappara experience highlights that the effectiveness of relief camps should not be measured solely by the adequacy of provisions but by how far they succeed in preserving human dignity and comforts in the face of displacement and loss.

### **VI. Conclusion**

The study concludes that relief camps in Kavalappara were largely effective in ensuring the provision of essential survival needs reflecting a strong and timely disaster response system. However, the moderate adequacy observed in aspects such as space, sanitation and psychosocial support highlights critical gaps in addressing the broader dimensions of human well-being. While overall satisfaction levels remain high, the presence of partial dissatisfaction indicates the need for more inclusive and comfort-oriented planning of relief camps. Therefore, future disaster management strategies must move beyond immediate relief to incorporate dignity, privacy and emotional care as integral components of immediate disaster response and recovery.

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