



IJEAST

INTERNATIONAL JOURNAL
OF ENGINEERING APPLIED SCIENCE
AND TECHNOLOGY



VOLUME : 6 ISSUE : 4 Print / Issue Publication Date: 17-Oct-2021



ISSN : 2455-2143



DOI : 10.33564/IJEAST.2021.v06i04.008

Indexed In



WWW.IJEAST.COM

editor@ijeast.com



ASSESSING THE DISASTER PREPAREDNESS OF INHABITANTS OF MONTSERRADO COUNTY, LIBERIA

Mogana S. Flomo, Jr.

College of Allied Health Sciences

CEPRES International University, Paynesville City, Montserrado County, Liberia

Abstract - Many communities continue to suffer from different forms of disasters, ranging from Flood, fire outbreaks, wind, and health-related disasters. The study was done in Montserrado County, Liberia, and sought to determine the proportion of homes actively prepared for possible emergencies, the proportion of households that get disaster intervention provided by the Government of Liberia during the time of the disaster, and the primary source of disaster information amongst various outlets. A community-based cluster sampling method was employed. Fifteen clusters were randomly selected, and we distributed 900 questionnaires, of which 791 came back. 90% of respondents heard about the disaster before, with about 32% of them being affected by a disaster. Only 17% discussed disaster at home, with 93% of all responsible family members not being current in First Aid. Less than 1% of family members know how to use fire extinguishers. 50% of respondents got information through the radio/TV stations (37%) of respondents rely on family and friends for information. 1% of the families expect government interventions, 28% from neighbors/community, and 14% from the Liberian Red Cross. 8% of families depend on themselves, with another 8% not knowing where to seek help.

To conclude, some households have been directly affected by a disaster. However, the majority are not prepared for disaster. National disaster response agencies, such as the Disaster Management Agency and the National Fire Service, need to be empowered to respond to disasters effectively and efficiently. Disaster preparedness in Liberia must incorporate training of community organizations responsible for disaster preparedness and be empowered to provide immediate intervention while calling for outside or national assistance.

Background of the study

Many communities have suffered and continue to suffer from different disasters, ranging from Flood, fire outbreaks, wind, and health-related disasters. Most of these instances have seen the loss of lives and valuable properties. In most cases, people who lose these properties belong to people at the lower end of the poverty line.

The year 2018 saw 315 natural disaster events recorded. As a result of these disasters, 11,804 deaths occurred, while 68,000,000 (sixty-eight people were affected). Across the world, a total of US\$131.7 billion in economic losses took effect (CRED, 2019). The impacts of disasters are usually very unbearable for those victimized.

Globally, different disasters continue to harm people, and the world has not adequately addressed the situations.

Problem Statement

In Liberia, disasters have become visible and usually destroy lives and properties. The levels at which various homes are prepared to handle an emergency are unknown. There is a lack of awareness about what to do before disasters at the household, community, and national levels. It appears that households are not aware of the availability of services before, during, and after a disaster. Additionally, the proportions of homes that are prepared for emergencies and those household members that may need special care are unknown. The factors or situations associated with disaster preparedness seem to be unidentified by any study in this locality. Regardless of their susceptibility to threat, findings in other populaces suggest that communities are often unprepared to cope with disaster and evacuation. Therefore, household and individual preparedness is critical to the overall effectiveness and cost-efficiency of the national disaster response strategy

Key words



Objective of the Study

This paper considers the level of preparedness various homes have in place to prevent or address disaster impacts.

Specific Objectives

1. Determine the proportion of homes actively prepared for possible emergencies.
2. Find the proportion of households that gets disaster intervention provided by the Government of Liberia during the time of disaster?
3. Find the significant source of disaster information amongst various outlets.

Research Question

Based on the need to understand the current state of disaster preparedness among families and communities and determine the impact on the general populace, the following research questions have been formulated.

1. Do households have enough awareness about what to do before and during a disaster situation?
2. What proportion of households gets disaster intervention provided by the Government of Liberia during the time of disaster?
3. Where is the primary source of disaster information?

The rationale of the study

It is almost like riding a willing horse to death if people are not prepared ahead of any form of emergency. This study will aid all stakeholders of society to understand Liberia's current state better when it comes to being prepared for emergencies at the family level and how it could affect the management of disaster at the national level. Additionally, policy-makers would use the results of this study to craft laws or regulations that would strengthen the Liberian approach to disaster management and subsequently preserve many lives and properties.

Related Literature Review

This section discussed disaster preparedness considering service availability before, during, and after emergencies, active preparation of households, disaster-associated factors, and other related issues. First let take a look at disaster preparedness and what it is meant according to internationally approved standards. "Activities and measures are taken in advance to ensure an effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations"

(UN/ISDR, 2019) "Pre-disaster activities, including an overall strategy, policies, and institutional and management structures, that are geared to helping at-risk communities safeguard their lives and assets by being alert to hazards and taking appropriate action in the face of an imminent threat or the actual onset of a disaster" (WHO, 2019).

With these two definitions, we are under obligation to ensure that people worldwide, especially those in disaster-prone communities, are provided the necessary services to prepare for emergencies.

Many households encounter different threats, including natural (such as hurricanes, floods, fires, and earthquakes) and human-made such as explosions or spills (Shay, 2014). Some features of contemporary life, comprising invasion of settlements into environmentally delicate or dangerous as well as individual commercial undertakings such as mining of natural resources such as gold, diamonds, manufacturing, and distribution, escalate the threats of disaster and intensify adverse effects on human communities (Shay, 2014). Loss of life and property damage, as well as social disruption, can overwhelm a community and may need years or decades to recover.

Family education about disaster preparedness

These local community members are usually at the mercy of any disaster that hits them unexpectedly. These people need to be prepared since they are always the first to begin responding to disaster before the professionals come to intervene (Ardalan et al., 2019).

Disaster education is one of the ways to increase preparedness levels for communities. A study to analyze the role of formal training in shaping an individual's propensity to prepare against disasters and identify mediating channels through which education may influence disaster preparedness; and investigate the importance of past disaster experience and its interplay with education found that education and disaster experience positively impact the propensity to undertake precautionary actions in both countries and for both outcome measures (Hoffmann and Muttarak, 2017) In Sub-Saharan countries like Liberia, with a literacy rate of less than 50%, there are high possibilities of having lower disaster preparedness levels.

Previous experience and disaster preparedness

Naturally, it is possible for a person who has been negatively affected by a particular situation to begin to put in place precautionary measures to avoid or prevent the impact of an emergency. Hoffmann and



Muttarak argue that the essential question is how to increase risk awareness for people who have not been affected by disasters so far (Hoffmann and Muttarak, 2017). They further believe that education can substitute disaster experience such that highly educated individuals can understand the disaster risks and anticipate the impacts without first-hand experience.

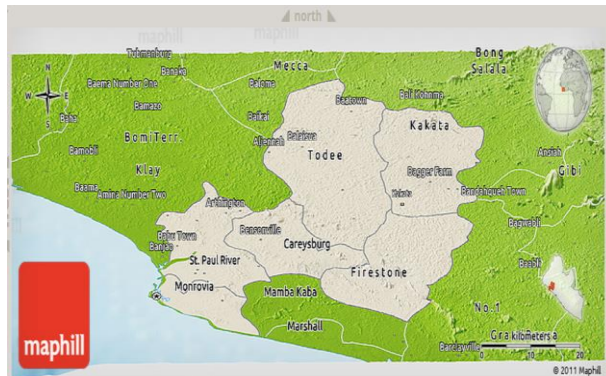
Disaster Call center

As disturbing as disaster is, it usually requires all the necessary care to prevent or reduce its impact whenever it hits a community. It becomes alarming when there is nowhere to call for help. As the case may be, there are several instances when households, especially those in remote countries, cannot reach out to aid providers through calls. The fact is that several incidents and accidents in the past few years have led to an increased focus on civil safety and on how we should prepare to handle significant scale incidents (Etholm, 2013)

Methodology

The study area

Montserrado County is the most populated county of Liberia and hosts the country's capital, Monrovia, the largest city, chief port, and National capital of Liberia. The county has a population density of 599.7 inhabitants per square kilometer. According to the 2008 census of Liberia, the county has a population of 1,118 241. It is about 738.5 square miles in size, thus being one of the minor counties in Liberia (Libspot, 2018).



Source: (Maphill, 2011)

Sampling

We administered a household survey designed and collected data on the awareness level of residents concerning services available before, during, and after

emergencies; Estimate the section of homes that actively prepare for possible emergencies and light on the factors associated with preparedness behaviors.

The survey asked for demographic information (gender, age, and home leadership status)

The study also asked for respondents' perception of their household's vulnerability to several different types of disasters. Additionally, the study considered their disaster preparedness, including whether or not they had a plan of where they and their family would go during an emergency, whether respondents had an emergency supply kit, and those that must be responsible for their basic needs (food, water, and shelter) during and immediately after a disaster. Finally, we asked the respondents to report the type of information they typically received during a disaster and from what sources.

A community-based cluster sampling method was employed. We postulated that 50% of the population was prepared for the emergency. A confidence interval width of 5% was selected with a confidence interval of 95%. The estimated design effect (DEFF) was 3, with an average number of observations per cluster being 50. As per this method, fifteen clusters were randomly selected. Thus, the study sample size was at least 750, but we distributed 900 questionnaires and got 791 of them back, which formed part of the analysis.

Results and Discussions

Social-economic characteristics of respondents

Table 1 indicates 791 respondents with ages ranging from 18 to 50 or more years in this study. Most (29%) of the respondents were in the age range of 26-33, while 24%, 21%, and 16% were in the age groups 34-41 years, 18-25 years, and 42-49 years, respectively. Fifty-five 437(55%) respondents were males, with 354 (45%) being females. About 49% of them were household heads. As is usually the case, 71% of the respondents were unemployed. The study discovered a relatively good number of the respondents had some level of education, with secondary education (34%) and university education (34%) taking the lead. However, it is essential to clarify that being a part of these levels of education does not imply that all of them have completed these levels. The study was interested in knowing the level a respondent had reached, including being in the process, completed, or dropped out. The most important thing was that the respondent was a part of such levels as far as the study considered education.

Table 1 Social-economic characteristics of respondents (n-791)



Socio-economic characteristics	Frequencies	Percentages	C.I 95%
Age (%)			
18 – 25	167	21.1	18.4 – 24.1
26 – 33	227	28.7	25.7 – 32.9
34 – 41	191	24.1	21.3 – 27.3
42 – 49	130	16.4	14.0 – 19.2
50+	76	9.6	7.8 – 11.9
Gender (%)			
Male	437	55.2	51.8 – 58.7
Female	354	55.8	41.3 – 48.2
Position in household (%)			
Head	391	49.4	45.9 – 52.9
Member	400	50.6	47.1 – 54.0
Employment Status (%)			
Employed	231	29.2	26.1 – 32.5
Unemployed	560	70.8	70.8 – 73.9
Education (%)			
Not Educated	89	11.3	9.2 – 13.6
Primary Education	52	6.6	5.1 – 8.6
Secondary Education	271	34.3	31.0 – 37.6
University Education	267	33.8	30.5 – 37.1
Vocational Education	112	14.2	11.9 – 16.8

Source: study field data, 2020

Distribution of respondents by general awareness and disaster preparedness

Table 2 shows respondents' general awareness and disaster preparedness. It shows that 90% of respondents heard about the disaster before, with about 32% of them being affected by a disaster. Unlike a study by Glago (2019) in which the majority of households (61%) were affected by disaster (Flood) (Glago, 2019), this study found that only 32% of families were affected. Notwithstanding, in the two studies, families in West Africa (Liberia and Ghana) have been affected by a disaster. On finding out if

families were relatively prepared for disaster, only 10% were of respondents admitted.

Interestingly, only 17% discussed disaster at home, with 93% of all responsible family members not being current in First Aid. Less than 1% of family members **know how to use fire extinguishers**, with 3% of them discussing fire drills and where to call during a disaster and 11% of them discussing a meeting place in case of disaster. About safeguarding the essential family properties, only 19% of families considered while 86% believed their families could be affected by a disaster.

Table 2 Distribution of respondents by general Awareness and disaster preparedness (n=791)

Variables Measured	Observed	Percentage	C. I @ 95%	P-Value<0.05
Heard of disaster before	713	90	87.9 – 92.0	1.000
Been affected by disaster	253	32	28.8 – 36.3	0.000



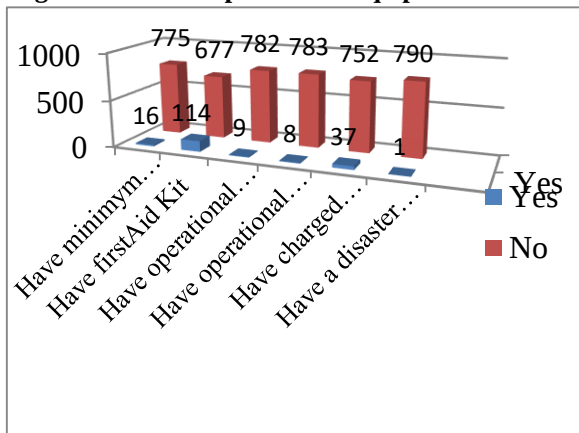
Family is relative well prepared	82	10	8.4 – 12.7	0.000
Discuss disaster with family	131	17	14.1 – 19.3	0.000
All responsible family members current in first aid	57	7	5.6 – 9.2	0.000
Know how to use fire extinguisher	18	2	1.4 – 3.6	0.000
All family members use fire extinguishers	3	0.4	0.13 – 1.1	0.000
Family discusses meeting places in case of disaster	89	11	9.2 – 13.6	0.000
Family practice fire drill	24	3	2.1 – 4.5	0.000
Family discusses where to call in case of disaster	22	3	1.8 – 4.2	0.000
Safeguard the most important family properties	153	19	16.7 – 22.2	0.000
Thinks family could be affected by disaster	679	86	83.2 – 88.1	1.000

Source: study field data, 2020

Access to disaster preventive equipment

It is an ordinary happening in Montserrado that most families do not have access to disaster prevention equipment. This study found that access to disaster equipment expected to be in a relatively average family home is lacking. It shows that 98% of families did not have minimum disaster supply, with 14% of them having a First Aid Kit while just 1% had operational smoke detectors in and outside their homes. Less than 1% of families have charged fire extinguishers at home, with an insignificant percentage of them accessing a disaster telephone contact.

Figure 1 Access to prevention equipment

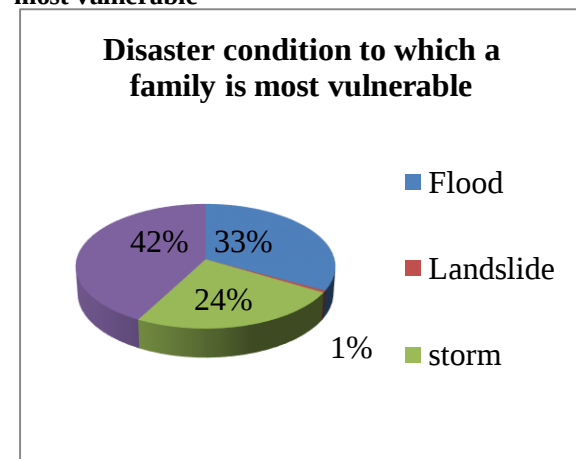


Source: Study field data, 2020

Disaster condition to which a family is most vulnerable

Figure 2 shows the disaster condition in which families are most vulnerable in Montserrado County. From the Pie Chart, we see that Fire outbreaks and Flood are the top two leading causes of disaster in the county, with 42%, 33% for Fire outbreaks, and Flood. The third most disastrous condition is a storm, with about 24% of families being affected.

Figure 2: Disaster condition to which a family is most vulnerable



Source: study field data, 2020

Providers of interventions in case of disaster

Table 3 shows family intervention expectations from different groups, with 41% of the families expecting interventions from the Government of Liberia, 28% from neighbors/community, and 14% from the



Liberian Red Cross. Additionally, 8% of families depend on themselves, with another 8% not knowing where to seek help.

Table 3: Providers of interventions in case of disaster

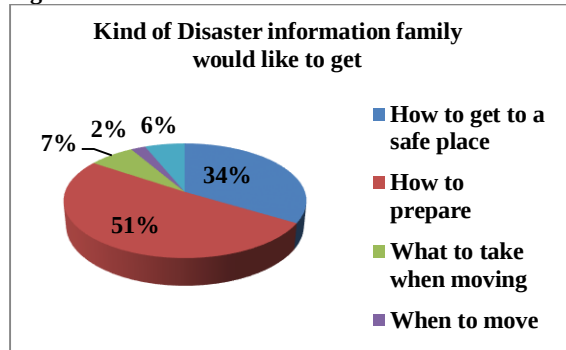
Expect intervention from	Observations	Percentage	CI @ 95%	P-Value<0.05
Government (%)	327	41	37.9 – 44.8	0.000*
Neighbors/community	223	28	25.2 – 31.4	1.000**
Red Cross	111	14	11.8 – 16.6	1.000***
Self	64	8	6.4 – 10.2	1.000****
Don't know	66	8	6.6 – 10.5	0.0000

Source: Study field data, 2020

Kind of disaster information family would like to get

Figure 3 displays the kinds of information families search for to understand disaster in the county better. This study shows that 51% of families in the study area want to learn how to prepare for a disaster before it comes to them. Thirty-four percent (34%) of families prioritized knowing how to get to a safe place in case of disaster, while 6% and 7% knew where to move and what to take with them respectively. A smaller proportion of the respondents (2%) wanted to know when to move to a safe place.

Figure 3: Kind of disaster information family would like to get



Source: Study Field data, 2020

Disaster Information sources

One major factor that possibly influences disaster unpreparedness is the lack of information. Thus, knowing where to find disaster information is a significant need. This study found that 50% of respondents got information through the radio/TV stations in the study area. In agreement with this result, Cretikos and others (2008) found that 78.1% of information sources were from radio (Cretikos et al., 2008). This shows that radio has been and is always a significant source of disaster preparedness information. Thirty-seven percent (37%) of respondents rely on family and friends for information. About 7% of them get information from the internet, 5% from the government agency and 1% from Newspapers. From this result, it was observed that the predominant source of disaster information is radio/television. Another study found that radio was a predominant source of information, with 44% of study respondents (Mow et al., 2017, p. 8). In many instances, like in this study, radio has been the most dominant source of disaster information.

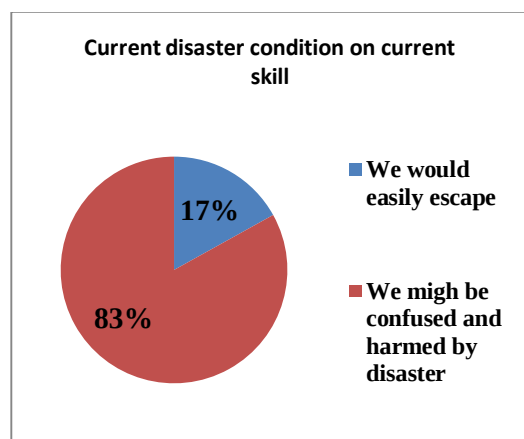
Table 4: Disaster Information sources

Disaster Information sources	Observations	Percentage	CI @ 95%	P-Value<0.05
------------------------------	--------------	------------	----------	--------------



Family/Friends	296	37	34.1 – 40.9	0.000
Government Agency	40	5	3.7 – 6.8	0.000
Internet	51	7	4.9 – 8.4	0.000
Newspaper	5	1	0.03 – 1.5	0.000
Radio/TV Station	399	50	46.9 – 53.9	1.000

Source: study field data, 2020



Source: Study Field Data, 2020

Figure 4 tells the current disaster condition based on the current skill of the respondents. 83% of respondents believe they might be confused and harmed by a disaster in case of an outbreak, while only 17% would easily escape the disaster.

Conclusion

Households in the research area generally have heard of disaster and are aware of its occurrences. It is also true that some households have been directly affected by a disaster. Most importantly, it is just a minute portion of the county's inhabitants who have put some mechanisms to handle disaster situations when they arise. It is alarming that most households in the study are not prepared to respond to an emergency. Households generally do not know how to use fire extinguishers, do fire drills, nor have first aid skills to respond to disasters. Scaringly, households hold the views that they would significantly be affected by a disaster if such a situation occurs. For information sources, households get information from several sources, mostly from radio/TV, family, and friends. Through its National Fire Service Agency, the government provides interventions when a disaster occurs.

Recommendation

Based on the results seen so far, the following would be helpful to reduce the impact of disaster whenever households become confronted with emergencies.

1. There is a need for increased community awareness to prepare households for disaster.
2. National disaster response agencies, such as the Disaster Management Agency, National Fire Service Agency, need to be empowered to respond to disaster effectively and efficiently.
3. Disaster preparedness in Liberia must include training of communities and setting up community organizations responsible for disaster preparedness and be empowered to provide immediate intervention while calling for outside or national assistance.
4. Training programs must include First Aid, Fire drills and fire extinguishers, safeguard of most essential family properties, and find information about the disaster.
5. More extensive research is required to look deeper into areas that this study did not cover.

References

- Ardalan, A. et al. (2019) 'Household disaster preparedness in the Islamic Republic of Iran: 2015 estimation', *Eastern Mediterranean Health Journal*. doi: 10.26719/emhj.19.048.
- CRED, N. D. (2019) *Natural Disasters 2018 - World*, ReliefWeb. Available at: <https://reliefweb.int/report/world/natural-disasters-2018> (Accessed: 19 October 2019).



Cretikos, M., Eastwood, K., Dalton, C., Merritt, T., Tuyl, F., Winn, L., & Durrheim, D. (2008). Household disaster preparedness and information sources: Rapid cluster survey after a storm in New South Wales, Australia. *BMC Public Health*, 8(1), 195. <https://doi.org/10.1186/1471-2458-8-195>

Etholm, K. (2013) Emergency call centers and large scale incidents: A comparison of the operators' perspective and a resilience model, Department of Psychology UNIVERSITY OF OSLO. Available at: <https://www.duo.uio.no/bitstream/handle/10852/36759/1/Etholmx-xmaster.pdf.pdf> (Accessed: 28 May 2021).

Glago, F. J. (2019) 'Household disaster awareness and preparedness: A case study of flood hazards in Asamankese in the West Akim Municipality of Ghana', *Jambá: Journal of Disaster Risk Studies*, 11(1), p. 11. doi: 10.4102/jamba.v11i1.789.

Hoffmann, R. and Muttarak, R. (2017) 'Learn from the Past, Prepare for the Future: Impacts of Education and Experience on Disaster Preparedness in the Philippines and Thailand', *World Development*, 96, pp. 32–51. doi: 10.1016/j.worlddev.2017.02.016.

Libspot (2018) 'Montserrado County is a county in the northwestern portion of the West African nation of Liberia.', 11 November. Available at: <https://libspot.com/montserrado-county/>, <https://libspot.com/montserrado-county/> (Accessed: 27 May 2021).

Maphill (2011) Shaded Relief Physical Map of Montserrado. Available at: <http://www.maphill.com/liberia/montserrado/maps/gray-map/> (Accessed: 28 May 2021).

Mow, I. C. et al. (2017) 'Towards a People Centred Early Warning and Disaster Response System in Samoa: The Use of ICT by Samoans During Disaster', *The Electronic Journal of Information Systems in Developing Countries*, 81(1), pp. 1–18. doi: <https://doi.org/10.1002/j.1681-4835.2017.tb00594.x>.

Shay, E. (2014) 'Assessing Disaster Preparedness of Officials and Residents in Two North Carolina Counties', *Journal of Geography & Natural Disasters*, 04(02). doi: 10.4172/2167-0587.1000125.

UN/ISDR (2019) International Strategy for Disaster Reduction (ISDR), International Strategy for Disaster Reduction The Americas. Available at:

<https://www.eird.org/eng/terminologia-eng.htm> (Accessed: 28 May 2021).

WHO (2019) Emergency Trauma Response to the Gaza Mass. Available at: https://www.un.org/unispal/wp-content/uploads/2019/06/WHORPT_300519.pdf (Accessed: 28 May 2021).

IJEAST

INTERNATIONAL JOURNAL
OF ENGINEERING APPLIED SCIENCE
AND TECHNOLOGY

ABOUT IJEAST

International Journal of Engineering Applied Science and Technology (IJEAST) is a peer-reviewed, open access journal that publishes high-quality research papers in the field of Engineering, Applied Science and Technology.

IJEAST aims to provide a platform for researchers, academicians, and professionals to share their innovative ideas, research findings, and practical experiences with the global scientific community.

FOCUS AREAS

- Engineering
- Applied Science
- Technology
- Innovation & Development
- Interdisciplinary Studies



PEER REVIEWED

All submissions are rigorously peer reviewed to ensure quality.



OPEN ACCESS

Free and unrestricted access to research for all.



GLOBAL REACH

Connecting researchers and professionals worldwide.



TIMELY PUBLICATION

We ensure a swift and efficient publication process.



For more information, visit our website

www.ijeast.com



INTERNATIONAL JOURNAL
OF ENGINEERING APPLIED SCIENCE
AND TECHNOLOGY

✉ editor@ijeast.com

🌐 www.ijeast.com

📍 India



2455-2143