

Damini App: Save Lives from Thunder and Lightning

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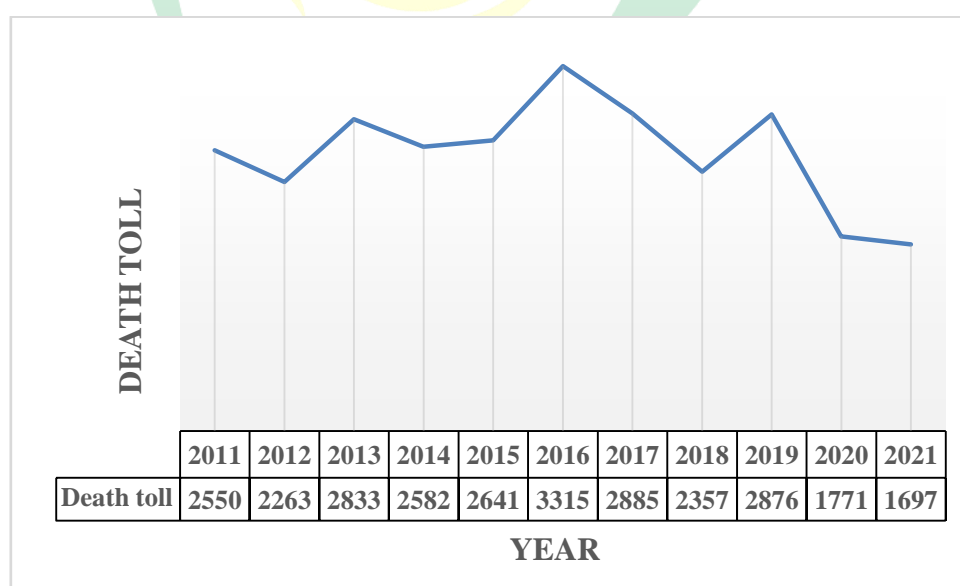
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ARTICLE ID: 11

Introduction:

All accidental deaths due to natural causes in nature account for 25 percent of deaths attributed to extreme weather events such as extreme heat waves, cold waves, heavy rain, lightning, and hurricanes. Among these, especially lightning strikes, lead to huge losses of people, livestock, and public property. For example, out of 1538 people who died from natural disasters in 2016, 424 people were killed by lightning. Most of them are farmers who work in the fields, and cattle and sheep herders are dying every year. The highest number of deaths due to lightning strikes is occurring in India, in a report released by the India Meteorological Department (IMD).

An average of 2500 people are killed by lightning every year in India and lakhs of cattle are killed. Following graph depicts the breakdown of lightning deaths of people every year since 2011 to 2021.



Source: Annual Lightning Report, 2021



Most lightning occurs during the months of May, June, and September. 2019 April to March 2020 (13,860,378) and 2020 April to March 2021 (18,544,367) editions of lightning occurred. In 2020 most lightning episodes occurred in the states of Tamil Nadu, Andhra Pradesh, Karnataka, West Bengal, and Odisha. According to the India Lightning Report 2020 released by Earth Networks, compared to the 2019 line, in 2020 percentage 22.60 increase in lightning versions has been found.

What is lightning?

Lightning is a phenomenon; it is the process by which electrical energy is released into the atmosphere. This usually happens during storm-rain. A normal lightning bolt can travel at speeds of 60 Km/sec and can withstand temperatures of up to 30,000 degrees. Typically, approximately 50 to 100 lightning strikes occur on Earth every day.

Thunder and lightning rapidly evolve weather phenomena, making accurate forecasting of events a challenge. The Indian Institute of Tropical Meteorology (IITM), Pune, under the Ministry of Earth Sciences, has established a lightning location network with about 48 data sensors in different parts of the country and is linked to a processing unit at the IITM Institute, Pune. This information network provides accurate information about lightning strikes and thunderstorm path movement. The information network is being expanded with the addition of more sensors to increase accuracy.

What are the main causes of death by lightning?

Among the various deaths caused by lightning, the highest percentage is 71 percent of people die from standing under a tree, while 25 percent of people are directly struck by lightning while working in the fields. The remaining 4 percent of people die from indirect lightning strikes. In indirect lightning strikes *i.e.*, after lightning strikes the ground, its electrical conductor travels until it strikes another object. Then if a human being or any living animal comes in contact with it, death will occur, and deaths due to excessive heat (side block) caused by lightning occurring very close are indirect deaths.

Analysis of lightning deaths:

Due to lightning occurrences, death cases are compared in urban and rural areas. In that 96 percent of deaths are occurring in rural areas and in this 65 percent of men and 35 percent are women. While working in the field 66 percent of men and 34 percent of children dying due to the occurrence of lightning.

Increased interest in lightning monitoring globally:

No reliable statistics are available on the number of deaths due to lightning strikes around the world and some countries do not even observe such death tolls. However, global interest in closely monitoring lightning activities, as in India, has recently increased. It stems from concerns about climate change.

Lightning Features:

- As the climate changes, so does the change in frequency.
- An increase in heating of the dry surface region will increase lightning activity
- Lightning is a special indicator of storms, thunder, and rain and is also a weather change factor.
- Lightning is not only an indicator of climate change but also has a direct impact on global climate.
- Lightning produces nitrogen oxides which are major greenhouse gases.
- By the flash of lightning/Light increases the temperature.

Safety measures during lightning:**A) Indoor precautions**

1. Avoid water during a thunderstorm. Lightning can travel through plumbing.
2. Avoid electronic equipment of all types. Electricity, radio, and television transmission networks are all susceptible to lightning.
3. Avoid corded phones.

B) Outdoor precautions

1. Find indoor shelter. Get into the closest hard-topped vehicle or structure you can find, keeping all windows closed, and wait inside for at least 30 minutes after the storm has passed before going outdoors again.
2. Get to low ground. Avoid hilltops and open areas.
3. Distance yourself from tall objects.

In just three north Indian states, 1,697 people have died as a result of lightning between 2020 and 2021. Lightning strikes have significantly increased manifold in states namely Bihar (168%), Punjab (331%) and Haryana (164%) in recent years. This year the maximum deaths occurred 74 (by June, 2022) in Bihar and nearly 50 (by July, 2022) in Uttar Pradesh. According to the National Crime Record Bureau, 2360 Indians are killed by



lightning on a multiyear average. Hence the increasing global interest in lightning monitoring and keeping this in mind India Meteorological Department realized the importance of thunderstorm forecasting in 2019 Indian Institute of Tropical Meteorology (IITM) and IMD took steps to develop Thunder/lightning forecasting tools.

What is Damini?

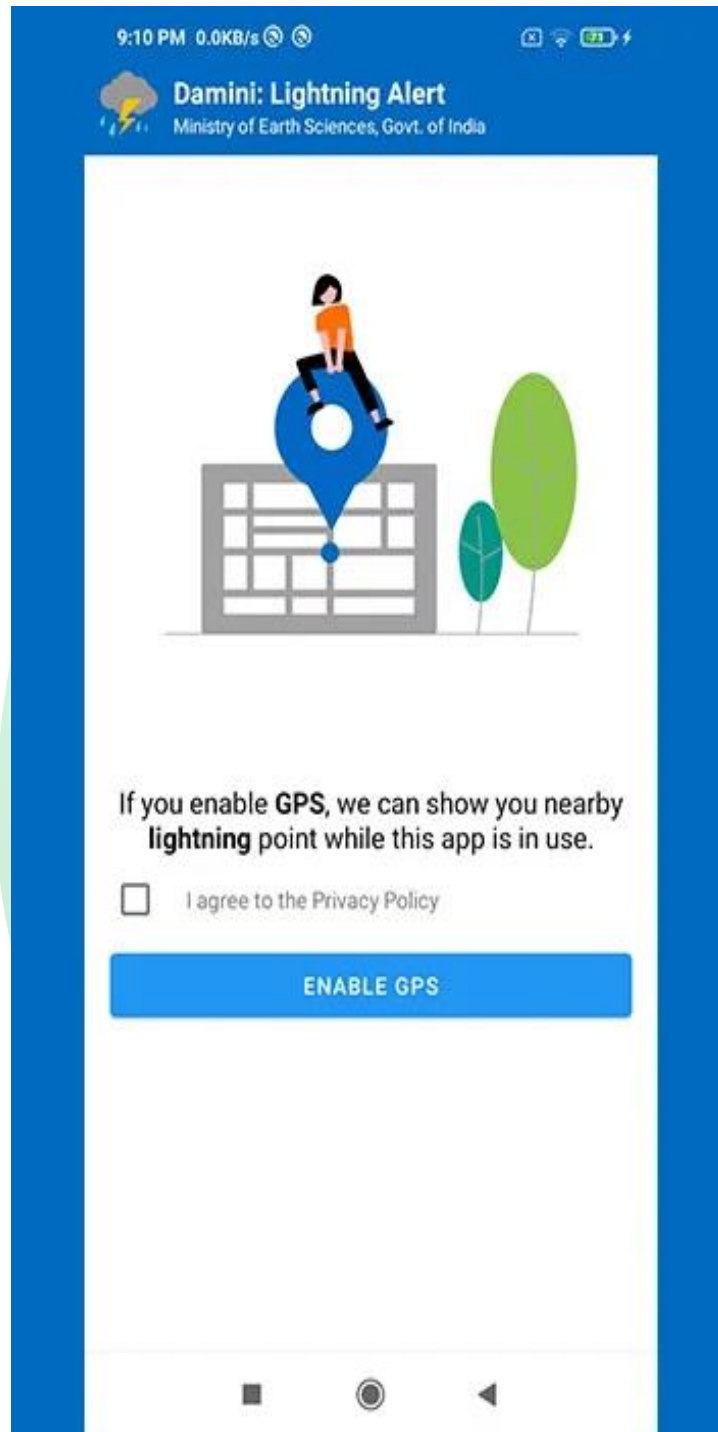
A Mobile App “DAMINI” on Lightning Location Network has been developed by the Indian Institute of Tropical Meteorology (IITM), Pune. 57th Foundation Day Celebration at IITM marked the date of its release. This network gives accurate information on lightning strikes and the route of a thunderstorm. To improve accuracy and dependability, the network is being expanded with the inclusion of more sensors. This application helps to track all the lightning activity near us by Global Positioning System (GPS) notification. This will help people to move to safe places during this time to avoid loss of life and livestock due to lightning. Alerts are currently being provided in Hindi and English and will be extended to regional languages later. The mobile application is available free of cost on the Google play store.

India now has a total of 48 lightning detection sensors, most of which are located in the Himalayas foothills and northern states. A lot of lightning strikes occur in the area. 20 more sensors are being added to the existing lightning detection sensors. All smartphone users should type "DAMINI" from the play store and download the app on their mobiles. Its use is very necessary for everyone, especially those who work in open fields and farmers.

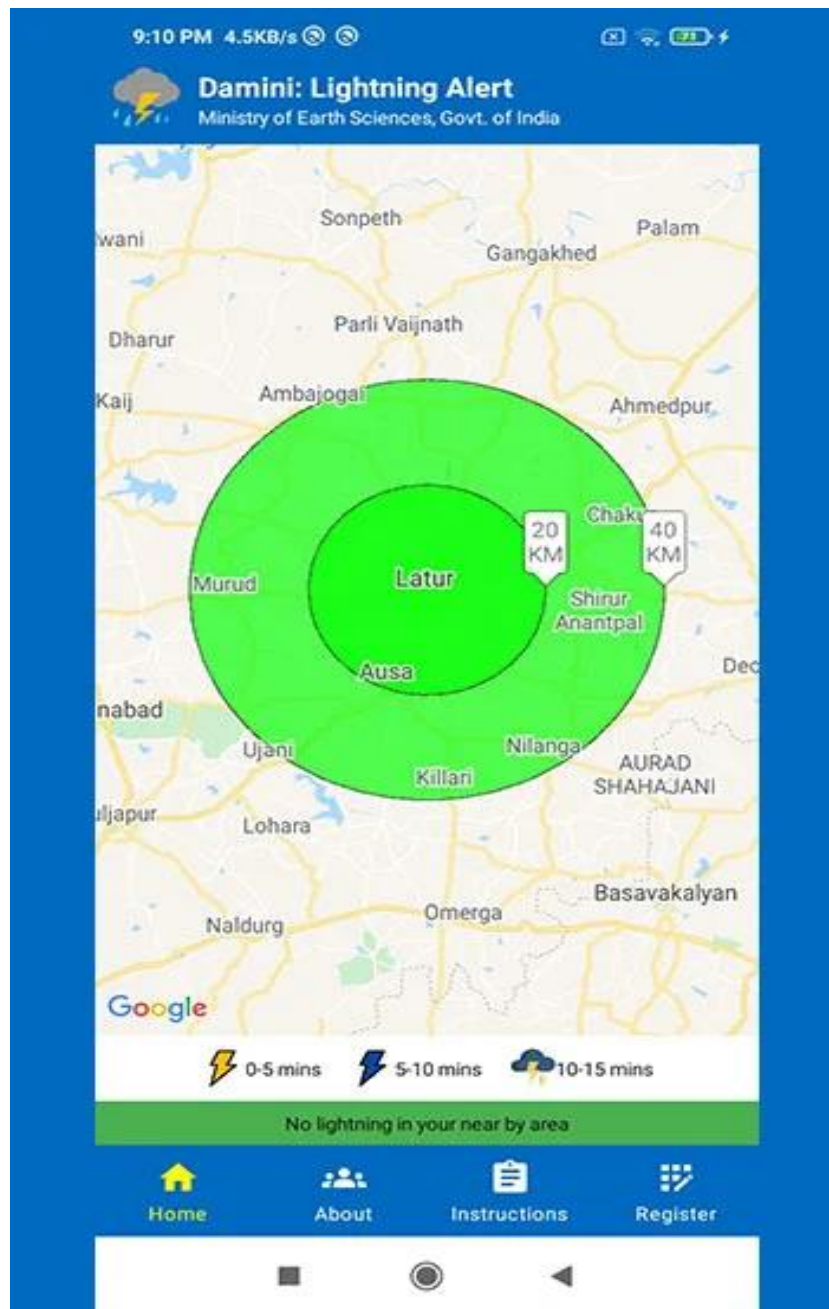
Procedure for download Damini: Lightning Alert app



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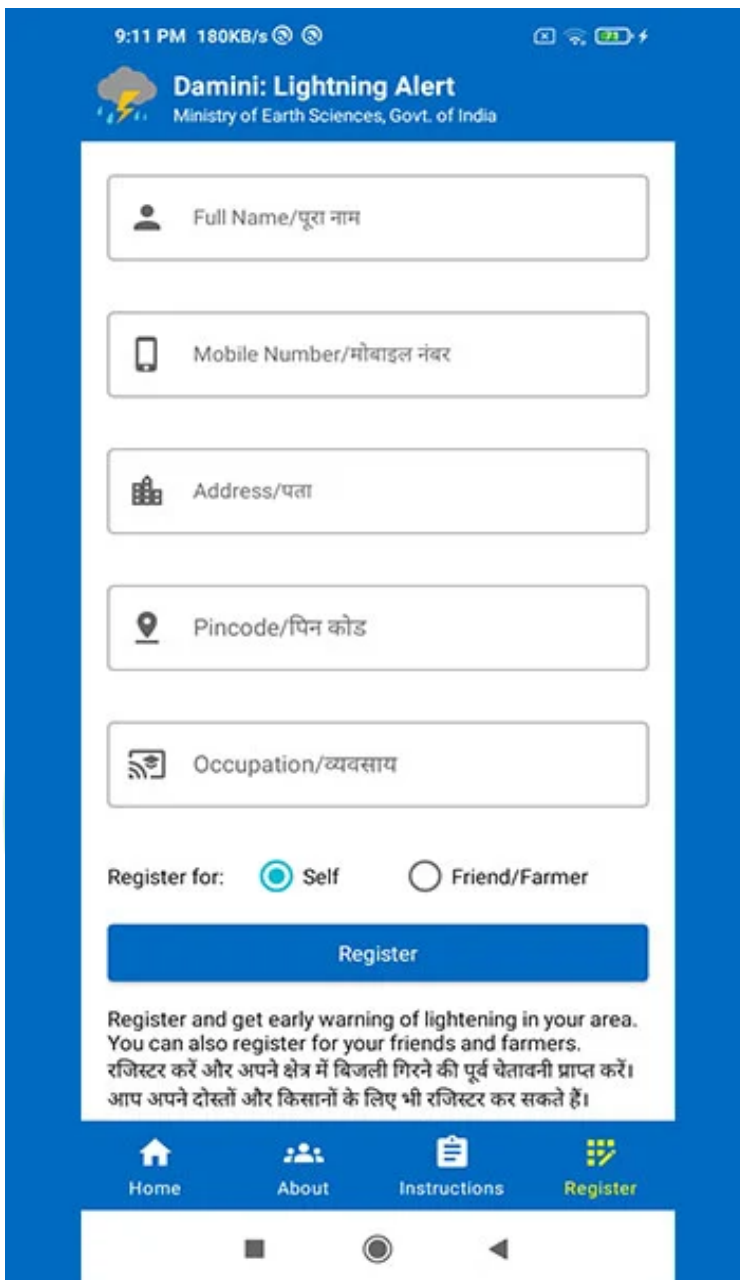


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9:11 PM 180KB/s

Damini: Lightning Alert
Ministry of Earth Sciences, Govt. of India

Full Name/पूरा नाम

Mobile Number/मोबाइल नंबर

Address/पता

Pincode/पिन कोड

Occupation/व्यवसाय

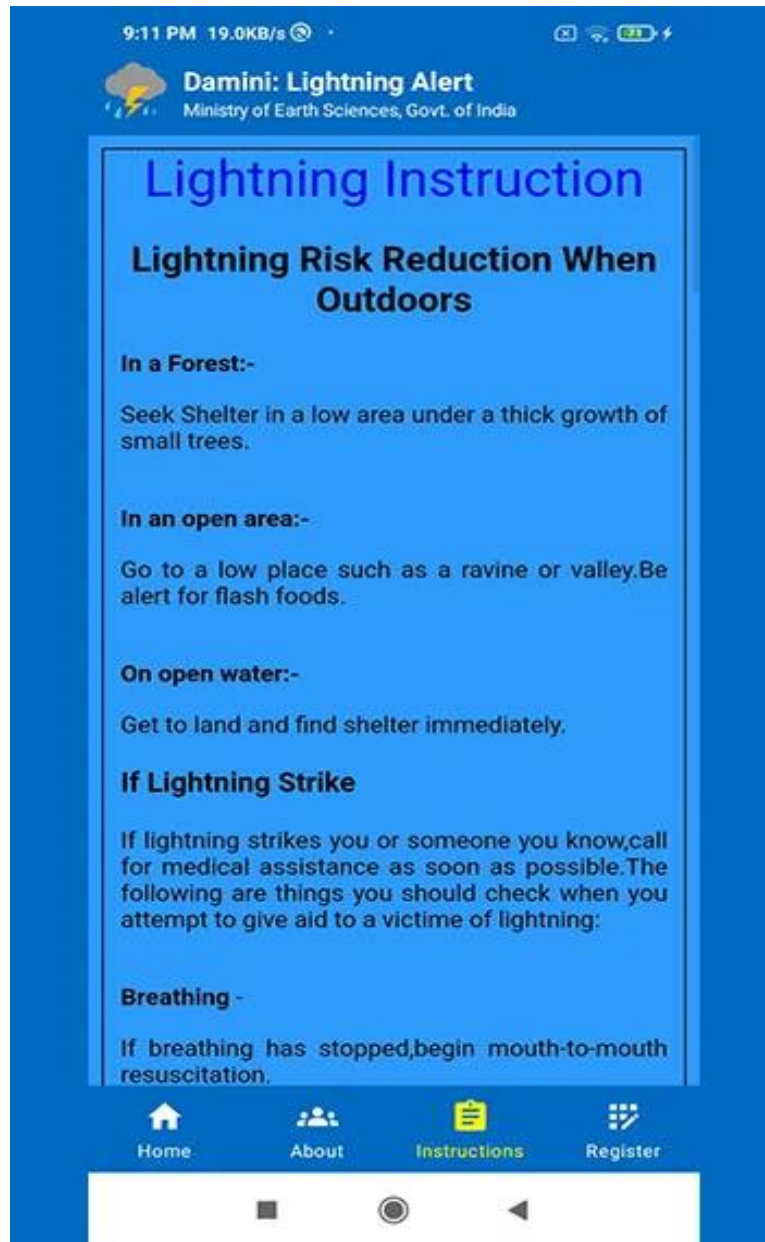
Register for: Self Friend/Farmer

Register

Register and get early warning of lightening in your area.
You can also register for your friends and farmers.
रजिस्टर करें और अपने क्षेत्र में बिजली गिरने की पूर्व चेतावनी प्राप्त करें।
आप अपने दोस्तों और किसानों के लिए भी रजिस्टर कर सकते हैं।

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