ISRO's Landslide Atlas of India

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In news– Rudraprayag and Tehri Garhwal in Uttarakhand are the most landslide-prone districts in the country, according to satellite data by the Indian Space Research Organisation (ISRO).

About Landslide Atlas-

- This report **looked at landslide vulnerable regions in 17 states and two Union Territories of India in the Himalayas and Western Ghats.**
- Rajouri, Thrissur, Pulwama, Palakkad, Malappuram, South Sikkim, East Sikkim and Kozhikode in Kerala, Jammu Kashmir and Sikkim are other high-risk districts, found Landslide Atlas of India 2023.
- According to it, all 12 districts of Himachal Pradesh prone to landslides.
- **Hyderabad-based National Remote Sensing Centre created the all-India database.**
- **The database includes three types of landslide inventory** – seasonal, event-based and route-wise for the 1998-2022 period.
- This Atlas provides the details of landslide present in Landslide provinces of India including damage assessment of specific landslide locations.
- The risk analysis in the report was based on the density of human and livestock populations, which indicates the impacts on people due to these landslides.
- The disaster in Kedarnath in 2013 and the landslides caused by the devastating Sikkim earthquake in 2011 are also included in this atlas.
- **It says that between 1988 and 2022, the maximum number of landslides 12,385 were recorded in Mizoram.**

- Uttarakhand followed it at 11,219, Tripura at 8,070, Arunachal Pradesh at 7,689, Jammu and Kashmir at 7,280. Kerala saw 6,039, Manipur at 5,494 and Maharashtra recorded 5,112 incidents of landslides.
- **Globally, landslides rank third in terms of deaths among natural disasters**. However, deforestation due to unplanned urbanisation and human greed increases the risk of such incidents.
- In 2006, about 4 million people were affected by landslides, including a large number of Indians.
- **India is among the four major countries where the risk of landslides is the highest**. If we look at the figures, **about 0.42 million square kilometres in the country are prone to landslides,** which is **12.6 per cent of the total land area of □□the country.**
- However, the **figure does not include snow-covered areas**.
- Around 0.18 million sq km of the landslide-prone areas in the country are in North East Himalaya, including Darjeeling and Sikkim Himalaya.
- Of the rest, 0.14 million sq km falls in North West Himalaya (Uttarakhand, Himachal Pradesh and Jammu & Kashmir); 90,000 sq km in Western Ghats and Konkan hills (Tamil Nadu, Kerala, Karnataka, Goa and Maharashtra) and 10,000 sq km in Eastern Ghats of Aruku in Andhra Pradesh, the atlas added.
- **Sudden heavy rains due to climate change are also increasing landslides**.
- **Around 73 per cent of landslides in the Himalayan region are attributed to heavy rains** and reduced water-absorbing capacity of the soil.

What is a landslide?

- Landslides, also known as landslips, are several forms of mass wasting that may include a wide range of ground movements, such as rockfalls, deep-seated slope

failures, mudflows, and debris flows.

- Landslides occur in a variety of environments, characterized by either steep or gentle slope gradients, from mountain ranges to coastal cliffs or even underwater, in which case they are called submarine landslides.
- Gravity is the primary driving force for a landslide to occur, but there are other factors affecting slope stability that produce specific conditions that make a slope prone to failure.
- In many cases, the landslide is triggered by a specific event (such as a heavy rainfall, an earthquake, a slope cut to build a road, and many others), although this is not always identifiable.
- Landslides occur when the slope (or a portion of it) undergoes some processes that change its condition from stable to unstable.
- This is essentially due to a decrease in the shear strength of the slope material, an increase in the shear stress borne by the material, or a combination of the two.
- A change in the stability of a slope can be caused by a number of factors, acting together or alone.