SMART INDIA HACKATHON 2025

TITLE PAGE

- **Problem Statement ID –** SIH25122
- **Problem Statement Title-** Disaster Management
- **Theme-** Mechanical Damper
- **PS Category-** Hardware
- **Team ID-**
- **Team Name-** Disaster Guardians

Disaster Guardians

IDEA TITLE

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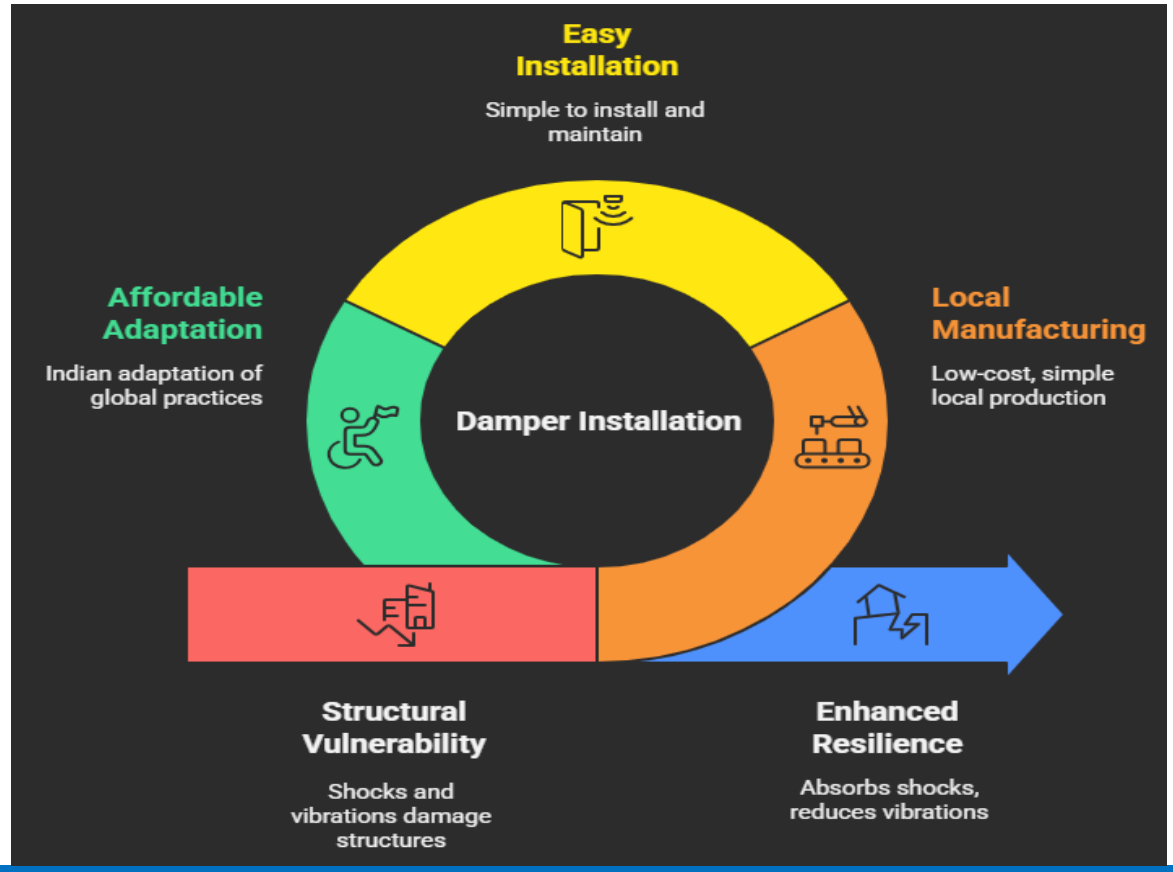
Mechanical Damper Prototype for Disaster Resilience

"Resilient Solutions for a Safer Tomorrow"



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TECHNICAL APPROACH

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- Technology Used: Mechanical spring–damper system.
- Working Principle:

Springs absorb shocks → dampers dissipate energy

- Design & simulation in Fusion 360.
- Prototype build with replaceable, low-cost parts.
- Testing for vibration damping efficiency.
- Flow:

Disaster vibrations → Damper absorbs → Structure protected

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FEASIBILITY AND VIABILITY

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- **Feasibility:** Uses basic, locally available materials (springs, dampers).
- **Viability:** Scalable from small shelters to bridges/metros.
- **Challenges:** Durability in large structures, awareness & adoption.
- **Strategies:** Modular design, field testing, govt. collaboration.

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IMPACT AND BENEFITS

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- **Social:** Saves lives during earthquakes, floods, disasters.
- **Economic:** Low-cost vs imported high-tech dampers.
- **Environmental:** Sustainable materials, low maintenance.
- **National Impact:** Disaster-resilient infrastructure across India.

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RESEARCH AND REFERENCES

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- **Japan:** Base isolation dampers for earthquake safety.
- **USA**: Tuned mass dampers in tall buildings.
- **India:** High-risk zones – Himalayan belt, Gujarat, NE states.
- Research papers on **vibration control & seismic safety**.
- **NDMA guidelines** for earthquake-resistant structures.