

DISASTERS AND HERITAGE

57% LAND IN INDIA IS PRONE TO EARTH QUAKES

28% VULNERABLE TO DRAUGHT

12% AFFECTED BY FLOODS

8% VULNERABLE TO CYCLONE



BADRINATH TEMPLE

CITY PALACE. BHUJ

**SEVERAL HERITAGE
STRUCTURES ARE
LOCATED IN
DISASTER ZONES**

DISASTERS AND HERITAGE

- **NORMAL BUILDINGS CAN BE RETROFITTED EASILY AFTER DISASTERS**
- **RETROFITTING THE HERITAGE STRUCTURES NEEDS CARE AND CAUTION TO SAFEGUARD HERITAGE CHARACTER**



CITY PALACE BHUJ

**PROACTIVE ACTIONS TO
SAFE GUARD THE HERITAGE
IS MUST**

DISASTERS AND HERITAGE

- **UNEVEN SETTLEMENT OF LAND AND LAND SLIDE IN HILLS**



WALL CRACKS



**STRUCTURAL CRACKS – BADRINATH TEMPLE
FACADE**



DISASTERS AND HERITAGE

A S I has 3600 protected monuments

States have 10,000 protected sites & monuments

INTACH has 22,000 listed buildings and monuments

Large number of Public Buildings, over 50,000, in different form of ownership qualify for HERITAGE status

**ENORMITY OF *PROACTIVE* MITIGATION EFFORTS
NEED A CONTINUOUS BUILDING OF DATA BASE**

Historical Backdrop, Architectural and planning information and information on

STRUCTURAL CONDITION, MATERIALS USED, RELEVANT TECHNOLOGY

need to be documented to facilitate proactive actions

DISASTERS AND HERITAGE

DATA BASE ITEMS TO ENABLE RETROFITTING

STRUCTURAL ISSUES

FOUNDATION SYSTEM AND SOIL CONDITION

LOAD BEARING STRUCTURAL SYSTEMS FOR WALLING AND ROOFING

MORTERS, CLAMPS AND OTHER BINDING MATERIALS

ARCHES, DOMES, VAULTS, COLUMNS AND CORREBLES AS STRUCTURAL SYSTEM

STRUCTURALLY INTEGRATED PLASTER, CARVING, PAINTINGS AND ARTIFACTS

STRUCTURAL HEALTH

*CRACKS/ DAMAGES/COLLAPSES etc. IN COMPONENTS-

-SUCH AS WALLS/COLUMNS/ROOFS ETC.

* SETTLEMENT IN FOUNDATION

* LEKAGES AND DAMPNESS

* VEGETATION GROWTH

* CORROSION OF STEEL COMPONENTS

*TILTS IN WALLS, COLUMNS, PROJECTIONS

* AGEING OF MATERIALS

*SOIL STRATIFICATION AND WATER TABLE, LAND SLIDES

*COASTAL ERROSION

*VIBRATION SOURCES IN VICINITY

* SESMIC ZONES AND WIND VELOCITY

DISASTERS AND HERITAGE

RETROFITTING TECHNIQUES

- *INTRODUCING SEISMIC BANDS
- *BRACINGS TO HOLD ROOF, COLUMNS & WALLS TOGETHER
- *LIGHTENING EXCESSIVE LOADS
- *BONDING TOGETHER EXTERNAL FACES OF THICK WALLS BY THROUGH STONES / BOLTS etc. WITHOUT ADVERSELY AFFECTING -HERITAGE CHARACTER OF BUILDING.
- * ADDITIONAL STRUCTURAL SUPPORT
- * STRENGTHENING FOUNDATIONS WHERE REQUIRED



100 YEAR OLD POLICE BUILDING AT RAPER, KACHCHH SUCCESSFULLY RETROFITTEED



CITY PALACE AT BHUJ AWAITING RETROFITTING

DISASTERS AND HERITAGE



LET US NOT WAIT FOR THIS TO HAPPEN

***PRO ACTIVE MEASURES IS THE ONLY WAY TO CONSERVE
THE HERITAGE***