**Earthquakes**

- **Light walls and gables** – smaller forces; less likely to collapse; compressed straw bales held together by nylon netting and sandwiched between plaster layers (Pakistan); straw is more resilient and warmer in winter; woven cane walls
- **Small windows** – less weak spots in walls
- **Reinforced walls** – metal, plastic mesh (Peru), eucalyptus, bamboo (India); wattle and daub (Latin America)
- **Light timber frame**
- **Confined masonry** – corner columns & reinforced concrete crown beam to frame brick walls and connect it to the roof (structure will move as 1 unit)
- **Shock absorbers** – tyres filled with stones/sand, fastened between floor and foundation

**Low-cost housing**

- Developed in Latin America
- Avoids breeze blocks, corrugated iron and concrete lintels
- Uprights pass through cement/gravel collar and are embedded in cement/gravel footings
- Cheap, local materials

**Bridges, motorways, railways**

- Cable supports linking girders and columns
- Steel coils to bind concrete supports
- Concrete infills between motorway piers

**Modify Vulnerability**

**Prediction and warning**

1) **Gap theory**
   - Faults can move in different ways
   - Knowledge of fault locations is incomplete
   - Previous magnitudes and frequencies can pinpoint risk areas and probabilities only
   - Some quakes may be irregular while other parts of the Earth continually slip
   - Advances in China, Japan and the USA
2) **Gap Theory** – California
   - Quakes recur at regular intervals
   - Pressure tends to build up at a constant rate before release
   - Parkfield fault, CA – recurrence interval of 22 years
     i. < 50 people; claims to be the earthquake capital of the world
     ii. Strainmeters measure deformation at a single point
     iii. 2-colour laser geodimeters measure the slightest movement between tectonic plates
     iv. Magnetometers detect alterations in the magnetic field caused by change in crust
   - Long-time scale; does not allow for movement on minor/unknown faults
3) Seismic gaps – localities along active fault lines where quakes have not occurred
4) Observe changes in the surroundings thought to be caused by ground dilation and rock cracking just before the quake
5) Northridge not predicted