Transdisciplinary Approach Toward Earthquake Recovery after 2015 Gorkha Earthquake in Nepal

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2015 Gorkha Earthquake: Basic facts

- **25 April 2015 Saturday** 11:56 am Local time (6:11 GMT)
- **Magnitude**: 7.8 (M_w)
- **Epicentre:** Near Barpak Village, Gorkha (**78km North-West from Kathmandu**)

❖ **Effects:**

- **8857 deaths**, about 22,309 injured
- About **800,000 houses**/buildings damaged
- **Loss:** approximately **6.6 billion dollars (~33% of GDP)**

Poorly constructed RCC buildings collapsed

Pancake Collapsed (Soft story failure)

Hilly settlements were hit harder:

Ridge effect

Severe Impact on Rural houses and Educational facilities

- Weak masonry construction
- Poor ductile detailing

Cause of loss and damage identified

- **Weak physical infrastructures/ poor design, construction techniques, and construction practices.**
- Plans (Building Regulations, Bye-Laws, Building Code etc.) were not well formulated/updated/Implemented.
- Focused on response and very limited preparedness activities (The Natural Calamity Act (Relief), 1982)
- **Absence of Disaster Risk Reduction plan at the local level**
- **DRR was not mainstreamed in development activates**

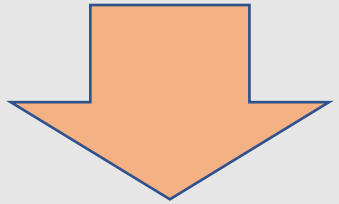
Major challenges in the recovery

Urgency for the reconstruction of about 800,000 Private Houses and About 8000 schools

A major component after 2015 Gorkha Earthquake

Strategies and approaches adopted

Transdisciplinary Approaches (TDA) for the recovery and reconstruction after 2015 Earthquake in Nepal



How it applied??

How it worked??

Strategies and approaches adopted

Transdisciplinary Approaches (TDA) for the recovery and reconstruction after 2015 Earthquake in Nepal

- ❑ **Private houses construction**

An owner-built system (owner-driven reconstruction approach) for reconstruction of the private houses (i.e. House owners need to construct their own houses with technical assistance from the government) -100% houses were reconstructed by this system

- ❑ **School Building Construction**

School Management Committee (SMC) based reconstruction of schools (SMC is responsible for the reconstruction of the school building with technical assistance from the government)- about 80% schools were reconstructed by this system

- ➢ **Scientific Knowledge-based Decision Making**
- ➢ **Collaboration, Coordination and cooperation among the stakeholders (working together modality)**

- ❑ **Minimize the cost (Public Private Partnership (PPP) model)**
- ❑ **Fast recovery (Shortening the reconstruction period)**
- ❑ **Maximize the ownership and sustainability**
- ❑ **Strengthen the community capacity towards resilience**

Design Catalogue of houses For Reconstruction– Simplified designs to support the Rural Housing Reconstruction

- **First Volume of Design Catalogue - 17 model designs -** strengthening the indigenous technology and construction practices using the locally available materials such as stone and wood.
- **Second Volume of Design Catalogue - 17 model designs-** comprising of alternative construction materials and technologies adopted by the community

The promotion of local technology and materials, supported by innovative research and development (TDA)

Public Awareness/Training

- House owner Training for resilient housing construction
- Public awareness campaign and mass rally on Earthquake Safety and resilient housing construction
- Community meeting to educate people about the Earthquake Safety

Working together to achieve common societal goal

Mason Training for preparation of skilled masons (7 Days and 50 Days)

- Knowledge integration
- Improved decision making process

- ❑ Support: Government of Nepal/WB/ Government of Japan/UNDP, I/NGOs etc. for mason trainings
- ❑ 7 Days training for existing masons
- ❑ 50 Days training for new masons

Certification by the Government Engineer (DUDBC)

Model building showing earthquake resilient elements in the community

Wooden seismic Beam/Band

- Model house built in the centrally located area of the community
- Demonstrating seismic Beam/Band and its importance to the public

RCC seismic Beam/Band

Contents: TDA for Building Societal Resilience to Disasters

Community Mobilization Program (CMP)

Contents of CMP: **One of the Important Transdisciplinary Approach (TDA)**

a) Orientation

for Community Based Reconstruction Committee（CBRC）

(Learn how to facilitate the community to

build earthquake resilient houses)

(Build Back Better)

+

b) Community Meeting

for all the house owners

Facilitate to solve the problems in group

(mutual support)

Share the importance of earthquake resilient house

(Build Back Better)

+

c) Technical Assistance by Lead/Mobile Mason

selected at each community to support house owners and skilled/unskilled masons for Building earthquake resilient house

(Build Back Better)

Holistic and Transformative Process of Building Resilient Society

Collaboration and Coordination with Partners (I/NGOs) for effective implementation at the local level

Model building showing earthquake resilient elements at community

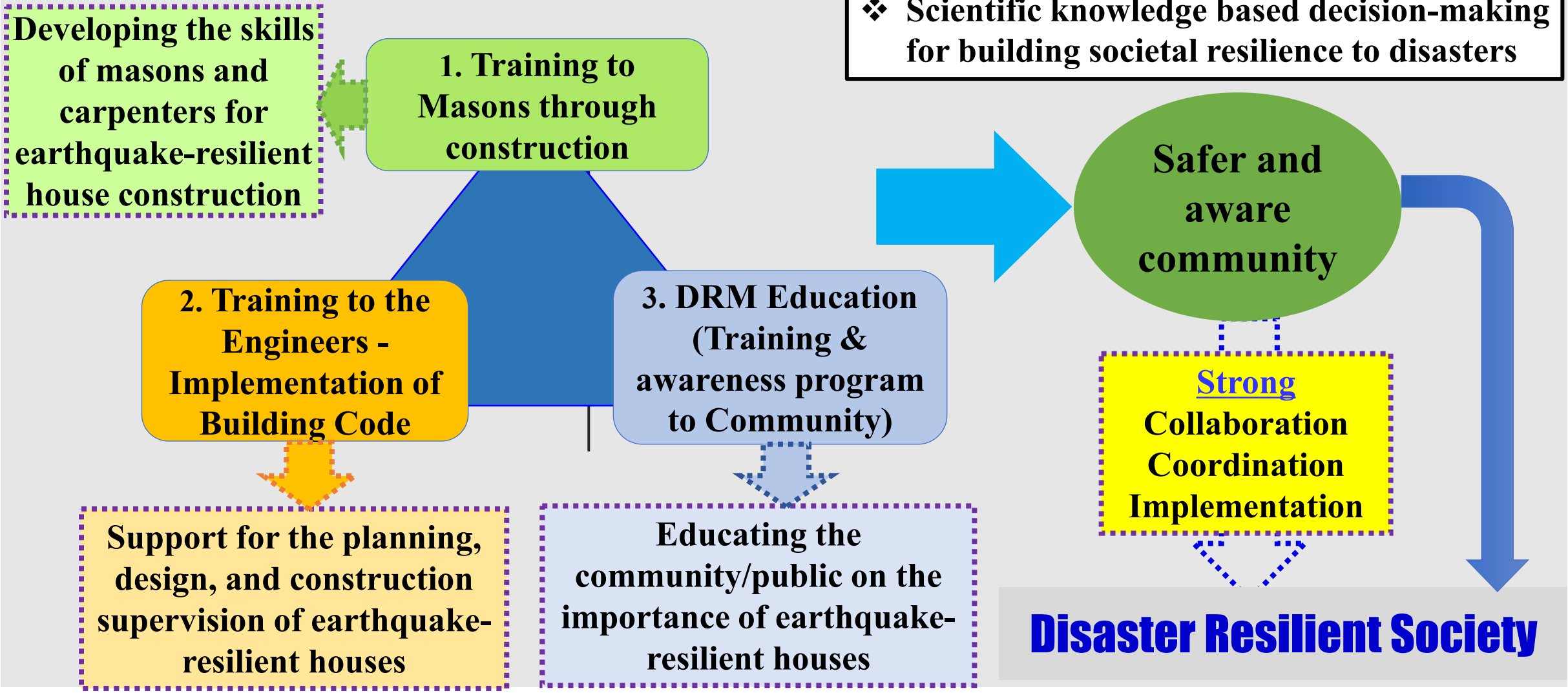
- ❖ **Technical support center in the community** to support for the planning, design and construction of earthquake resilient houses
- ❖ **Information dissemination for community awareness** about government policy and technical aspect regarding earthquake resilient buildings construction
- ❖ **Coordination and collaboration with the I/NGOs and community based organizations** for all aspects of recovery and reconstruction

- ➢ Common societal goal to be achieved shared by multiple stakeholders.
- ➢ All related stakeholders work together.

Holistic TDA for resilient houses construction

TDA

- ❖ Common societal goal to be achieved shared by multiple stakeholders.
- ❖ Scientific knowledge based decision-making for building societal resilience to disasters



Conclusions

1. Integrated recovery policies and robust institutions are crucial.
2. Key elements of a Transdisciplinary Approach (TDA) that were instrumental in the recovery process include technical interventions utilizing modular building designs, an Owner-Driven Reconstruction (ODR) approach, and community mobilization programs.
3. The social dimension of the recovery involved strengthening community ownership through community mobilization program and collaborations with stakeholders in the reconstruction field. This fostered a shared societal goal among multiple stakeholders.
4. The promotion of local technology and materials, supported by innovative research and development (TDA), is essential for cost-effective and sustainable construction.
5. Despite the significant loss of life and property during the Nepal earthquake, many valuable lessons were learned from the TDA adopted during the recovery and reconstruction process. Nepal's experience and interventions in rebuilding after the earthquake serve as an exemplary model for the region and the rest of the world.

Thank You