CASE STUDY

NEPAL 2021-2023 / EARTHQUAKE

CONTEXT / SETTLEMENT | SHELTER TYPE | SUPPORT METHODS

CRISIS	The 2015 Gorkha Earthquake
PEOPLE AFFECTED	8 million people affected*
PEOPLE DISPLACED	188,900 people displaced**
PEOPLE WITH SHELTER NEEDS	1,355,657 individuals***
PROJECT LOCATIONS	Kaski, Tanahun, Lamjung, Chitwan, and Makwanpur districts
PEOPLE SUPPORTED BY THE PROJECT	8,932 HH direct beneficiaries (44,660 Individuals | 3,573 HH female, 5,359 HH male)
PROJECT OUTPUTS	4,000 safer homes supported for reconstruction: 3,218 HH with cash assistance; 482 HH with customized assistance (materials / labour); 300 HH with full house construction. 7,172 HH supported with livelihoods, of which 4,436 HH provided with in-kind agricultural inputs. 56 water systems rehabilitated.
SHELTER SIZE	26 m² (average shelter size) 20 - 93 m² (for shelters supported with cash)
SHELTER DENSITY	5.2 m² / person on average 4 - 18.6 m² / person on average (cash support)
DIRECT COST	USD 5,210 - 6,700 per shelter (construction) USD 372 per household (cash support)
PROJECT COST	USD 5,782 per household (construction) USD 765 per household (cash support)

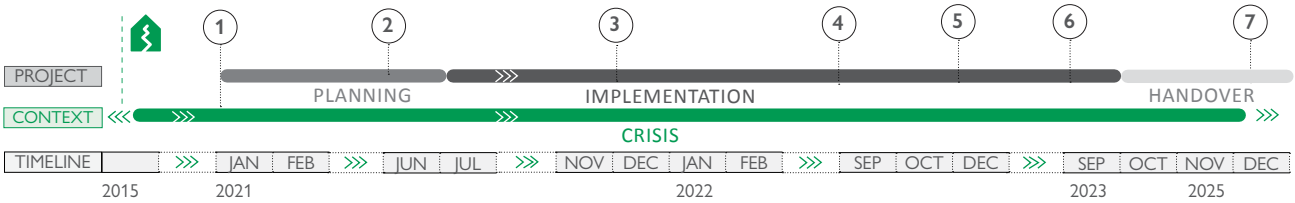
PROJECT SUMMARY

This was a three-year, USD 10 million initiative, aimed to support 8,932 vulnerable families in Nepal, addressing their recovery needs six years after the 2015 Gorkha Earthquake. Focusing on shelter, livelihoods, and water infrastructure, the project helped 4,000 families rebuild safer, earthquake-resistant homes, provided livelihood training to over 7,000 families, and supplied material inputs to 4,436 families. Additionally, by leveraging government and community contributions, the project repaired or constructed 56 water infrastructures, benefiting 2,127 families. Through its comprehensive approach in moderately affected districts, the project played a pivotal role in supporting long-term recovery and enhancing community resilience post-disaster.

Gov of Nepal, National Planning Commission;

UN OCHA;

Central Level Project Implementation Unit, Department of Urban Dev & Building Construction (July 2020).



April 2015: Gorkha Earthquake.

1. **Jan 2021:** Project Launch.
2. **June 2021:** Initial Community Assessment to identify the needs and Community Feedback Mechanism Established.
3. **Dec 2021:** Year 1 Achievements - 900 HHs with shelter construction, livelihood input support to 1,000 HHs, and completion of 10 water infrastructures.
4. **Sep 2022:** Mid- Project Evaluation to assess progress and impact.
5. **Dec 2022:** Year 2 Achievements - 2,700 HHs with shelter construction, livelihood input to 3,500 HHs, training to 3,900 HHs and 40 water infrastructures.
6. **Sept 2023:** Year 3 Achievements - 4,000 HHs with shelter construction, livelihood input to 4,436 HHs, training to 7,172 HHs and 56 water supply systems.
7. **Dec 2023:** Project Closeout and Impact Assessment.

The project provided multisectoral support to households who, after six years from the earthquake, still hadn't been able to access reconstruction assistance.

BACKGROUND

In 2015, Nepal's Earthquake caused extensive loss of life and widespread destruction to housing and infrastructure, leaving millions of people affected and hundreds of thousands displaced. Following it, national recovery was anchored in a homeowner driven model that enabled many families to rebuild; however, six years on, significant gaps remained for households unable to navigate technical, financial or administrative hurdles. These households faced a sustained deficit in safe and dignified housing, coupled with persistent limitations in livelihoods and water services.

By the time this project began in 2021, many households still needed durable shelter solutions, reflecting both the scale of the original disaster and the uneven capacity of households to meet compliance requirements for tranche-based reconstruction grants. Local governments newly empowered during recovery were consolidating their roles in guiding and approving reconstruction activities, while partners sought to identify and unlock the barriers that continued to stall progress for the most vulnerable.

SITUATION BEFORE THE EARTHQUAKE

Pre earthquake, many rural communities faced chronic poverty, limited access to basic services and livelihoods grounded in small scale agriculture. Housing commonly relied on local materials and traditional construction techniques, with limited seismic-resistant detailing. Social inequities, including gender and disability related barriers, reduced access to information, finance and services. These underlying vulnerabilities not only magnified the impact of the earthquake but also complicated the recovery, as households with fewer resources struggled to muster the inputs needed for safe reconstruction.

SITUATION AFTER THE EARTHQUAKE

The earthquake displaced hundreds of thousands of families into temporary or substandard shelter solutions with minimal protection, sanitation or security. Damage to road, market and service infrastructure, especially in hill and mountain areas, slowed recovery and drove up the transaction costs of compliance for vulnerable families, creating a cycle in which those with the least capacity were the least able to move forward.

The subsequent COVID 19 pandemic added pressure on incomes and access to services, further delaying reconstruction and reinforcing the need for targeted and context appropriate support to transition households to safer, compliant homes.

NATIONAL RECONSTRUCTION STRATEGY

The Government of Nepal's Post Disaster Recovery Framework guided an owner driven approach implemented through the National Reconstruction Authority (NRA). Grants were disbursed in tranches against construction milestones verified by technical staff; minimum compliance standards ensured seismic safety through features such as horizontal bands and improved connections.

Over time, implementation authority transitioned to local governments to improve responsiveness and accountability. The approach was effective for many, yet it also left significant numbers behind. Households who lacked documentation, technical understanding or the liquidity to navigate procurement and labor markets. Partners complemented the national model with technical assistance, targeted procurement and livelihood support to address these gaps.

Targeted households were supported either with cash, in-kind materials or direct reconstruction for the most vulnerable cases.

PROJECT DESIGN

Launched in 2021, the project focused on households that had not started or completed reconstruction yet. Its objective was to secure for them compliant homes by calibrating assistance to their capacity and constraints, while simultaneously strengthening livelihoods and water services.

Three modalities matched the diversity of needs:

- Cash transfers to homeowners with the capacity to manage materials and labor, enabling them to complete works, reach compliance and unlock government tranches.
- In kind support (materials, labor, transport) for those unable to progress with cash alone, bridging technical and logistical gaps that prevented milestone achievement.
- Full construction support for households facing multiple, compounding barriers (such as disability, age, social exclusion or documentation hurdles) that precluded compliance without direct execution support.

Modality selection was grounded in socio economic profiling and household vulnerability assessments at registration. The program paired these modalities with technical assistance to guide decision making, sequencing and quality control, with the explicit aim of reducing the risk of non compliance and improving the pace and standard of reconstruction.

PROJECT IMPLEMENTATION

Implementation combined homeowner agency with structured technical guidance and, where necessary, direct construction. Six earthquake resilient typologies were approved and applied under full construction support:

- Brick Masonry in Cement Mortar (BMC);
- Compressed Stabilized Earth Blocks (CSEB) in cement mortar;
- Hollow Concrete Blocks in cement mortar;
- Stone Masonry in Mud Mortar with galvanised iron wire containment;
- Stone Masonry in Mud Mortar with concrete bands;
- Stone Masonry in Mud Mortar with timber bands.

Typology selection was guided by technical feasibility, homeowner preference, and local context rather than being prescriptive. Households were oriented on all options, and choices were often influenced by familiarity and cultural acceptance, particularly for commonly used types like BMC. Availability of local entrepreneurs and materials (e.g., CSEB producers or hollow blocks) was considered to accelerate construction. In remote areas, typologies using locally available materials such as stone and timber were prioritized to reduce transportation challenges, cost, and delays.

Each typology incorporated ductile detailing, including horizontal bands (plinth, sill, lintel and roof), vertical reinforcement at corners and wall junctions, and improved connections at openings, translating seismic principles into practical, locally executable measures.

Owner led cases were supported through mobile engineers who provided site visits, plan reviews, corrections and verification support to progress through tranche milestones. In in kind and full construction cases, the project managed procurement, transport and workmanship while engaging local artisans and laborers to embed skills in the community.

TARGETING & COMMUNITY ENGAGEMENT

Selection combined household surveys, vulnerability scoring and technical assessments. Data were disaggregated by household head gender, age and disability, alongside other vulnerability factors, to inform the modality and technical assistance needed for each case. Participatory assessments enabled communities to surface priorities and tailor shelter layouts within compliant typologies. Training and technical assistance were adapted to enhance accessibility and usability, including disability friendly features (ramps, handrails and appropriate WASH features). Monitoring incorporated gender sensitive indicators.

Multiple housing typologies and construction techniques were adopted, based on owner's preference, material availability and local context.

Community mobilization supported owner led construction, while training and on site coaching helped households supervise works and understand maintenance responsibilities. A feedback mechanism (including toll free numbers and meetings) allowed issues to be raised and resolved in real time, strengthening trust and accountability. Households and local artisans thereby became co producers of safer construction, with community members also engaged in the rehabilitation and stewardship of water systems.

TECHNICAL APPROACH

Technical assistance emphasized translating compliance requirements into step by step, feasible actions. Across typologies, key safety features included:

- Horizontal bands at plinth, sill, lintel and roof levels to ensure box action.
- Vertical reinforcement at corners and at wall junctions.
- Galvanised iron wire confinement for stone masonry in mud mortar where applicable.
- Consistent mortar quality and improved opening placement and sizing.
- Strengthened wall to roof connections.

Fully constructed houses averaged 26 m^2 of covered area across two rooms with a porch, while supported houses ranged from 20 to 93 m^2, reflecting site conditions, household needs and NRA compliance. These measures preserved cultural appropriateness and local material use while embedding resilient detailing into everyday construction practice.

COORDINATION

Implementation aligned with ward and municipal authorities to expedite technical approvals and tranche releases under NRA guidance. At national level, a housing and settlements platform co-led by the project organization (called HRRP) convened government bodies and partners to address systemic bottlenecks, such as inspection backlogs and documentation obstacles.

DISASTER RISK REDUCTION

In the housing component, compliance with seismic detailing reduced vulnerability to earthquakes; site selection and siting practices reflected government safety checklists to avoid landslide prone slopes, filled ground and flood exposed areas, reinforcing climate sensitive planning in reconstruction. For the water systems, the project prioritized resilient sources and equipped user committees with capacity for maintenance and fee collection, ensuring functionality through seasonal cycles and reducing post disaster health risks.

MATERIALS AND SUPPLY

Supply strategies were tailored to local market realities. Where markets functioned, cash allowed homeowners to procure materials and labor locally; where markets were thin or households lacked the capacity to manage purchasing, the project provided material inputs directly and organized transport. Community contributions (including labor and locally available materials) were facilitated where appropriate. This blended approach reduced delays, aligned with local norms and helped stabilize prices through predictable demand.

ENVIRONMENTAL CONSIDERATIONS

Technical options such as interlocking compressed stabilized earthen blocks and confined stone masonry reduced reliance on fired bricks, mitigating carbon emissions associated with kiln fired materials. Water quality testing and collaboration with local agencies guided the design of sustainable water systems that minimized ecological impacts. The promotion of local inputs, including seeds and livestock under livelihoods, further reduced transport burdens and supported climate sensitive recovery.

Ramps, handrails and accessible sanitation facilities were provided when needed by participants with disabilities.

Several technical solutions were identified for improved earthquake resistance, including for traditional construction techniques, such as including galvanised iron wires in stone masonry with mud mortar.

MAIN CHALLENGES AND ADAPTATIONS

Rugged terrain, weather disruptions and thin local markets increased logistics costs and risks of delay. The program responded with flexible procurement (switching between cash and in kind), mobilizing and rotating local masons to address labor gaps, and sequencing activities to leverage favorable weather windows. Where weather hampered construction, teams advanced administrative steps, including facilitating bank transfers for cash top ups, to maintain momentum.

Evolving technical guidance and delays in tranche disbursements challenged households' confidence and sequencing. The project mitigated these effects by working through ward and municipal channels, coordinating with all related stakeholders to expedite inspections and align households to requirements. Barriers for households lacking documentation were addressed through locally grounded guidance and case work with authorities, reducing rejection risk and maintaining pathways to compliance.

OUTCOMES AND WIDER IMPACTS

Beyond direct multisectoral support for 8,932 families, at systems level the housing and settlements platform helped unlock USD 10.68 million in government grants for project participants and catalyzed USD 8.25 million for an additional 39,067 families. This showed sector wide influence through policy engagement. The platform's approach also informed a later replication in Pakistan, where a similar mechanism was used to support large scale recovery from floods. By institutionalizing practical solutions to administrative and technical bottlenecks, the project contributed to more enabling reconstruction systems beyond its own implementation footprint.

HANDOVER AND SUSTAINABILITY

Owner led construction, supported by mobile technical assistance, positioned households to maintain and upgrade their homes over time. Skills transferred to local artisans through on site coaching promoted the continuation of seismic detailing in routine works. For the water systems component, user committees were trained and systems handed over with defined roles for fee collection and maintenance. Formal hand over with ward and municipal authorities consolidated responsibility and documentation, and post project feedback channels remained available to address residual issues. Together, these measures anchored outcomes in local capacities and governance, enhancing the likelihood of durable, scalable improvements.

FURTHER READING ON SHELTER PROJECTS

On Nepal eartquake: SP 15-16 / A.3-A.7; SP 17-18 / A.18.

On coordinated housing recovery: SP 17-18 / A.17 NEPAL 2015-2019; A.15 SP 10TH ED. / PAKISTAN.

STRENGTHS, WEAKNESSES AND LESSONS LEARNED

STRENGTHS

√ **Participatory assessment, mobilization and feedback mechanisms** ensured that designs and sequencing reflected household realities, strengthening acceptance, accountability and long term use.

√ **Integrated shelter–livelihoods–water approach.** Pairing safer housing support with livelihoods inputs and the rehabilitation of 56 water systems addressed interdependent barriers, improving habitability and enabling households to sustain gains.

√ **Robust capacity building and Build Back Safer focus.** Training on safer construction, financial management and practical building techniques equipped households and local masons with actionable skills; 92% of participants later reported feeling safe in their homes.

√ **Adaptable delivery to overcome access constraints.** Flexible procurement (cash, in kind, full construction) and labor rotation strategies mitigated rugged terrain, market thinness and weather disruptions, maintaining continuity without compromising standards.

√ **Strong monitoring and responsive management.** Regular check ins and feedback enabled timely adjustments; joint monitoring and government endorsement reinforced transparency and compliance with safer building principles.

√ **Effective government collaboration and policy leverage.** Engagement through a national platform mobilized CLPIU engineers and accelerated inspections and tranche releases, unlocking over USD 10 million for participants and catalyzing additional grants for tens of thousands more.

WEAKNESSES

× **Resource and accessibility limits in remote areas.** High transport costs and limited availability of materials and water infrastructure constrained coverage; some families in remote locations remained harder to reach within the project timeframe and budget.

× **Economic constraints undermined compliance for some.** Even with support, meeting construction standards was difficult for households with minimal liquidity, leading to delays or partial progress and highlighting the need for deeper, longer support in select cases.

× **Communication gaps and inconsistent follow up in a few cases.** Despite strong engagement overall, some participants were unclear about eligibility or procedures for subsidies, and occasional follow up gaps weakened feedback loops and satisfaction.

× **Bureaucratic hurdles and policy shifts.** Delays in disbursements, shifting regulations, land issues and variable local government capacity slowed execution, consuming time and effort to maintain household confidence and momentum.

Beyond housing reconstruction, the project supported entire villages with the rehabilitation of water systems.

LESSONS LEARNED

- **Ground design in local context and typologies.** Familiar, compliant typologies that use local materials and skills increase acceptance, improve build quality and facilitate replication by households and artisans after project end.
- **Pair technical training with financial and practical coaching.** Comprehensive training that includes construction, financial literacy and small enterprise skills helps households sequence works, supervise labor and sustain improvements.
- **Communicate clearly and often.** Simple, repeated communication on eligibility, steps and feedback channels reduces confusion and improves participation; ensure guidance is accessible to all literacy levels.
- **Strengthen follow up systems.** Consistent, structured follow up on community feedback fosters trust, improves outcomes and supports course corrections before issues become entrenched.
- **Plan for environmental sustainability from the start.** Adopt lower carbon materials where feasible (e.g., CSEB) and build resilience into water systems; integrate environmental screening in design to minimize ecological impacts.
- **Build coordination and advocacy into co funded, policy linked programs.** For programs tied to government subsidies, formal platforms and early coordination with authorities are critical to expedite inspections, tranche releases and approvals.