



RAPID EARTHQUAKE RECOVERY IN NEPAL

UNDP PROJECT FUNDED BY THE GOVERNMENT OF JAPAN

FINAL REPORT

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Irkhu, Sindhupalchowk: Emergency employment generated through safe debris management and demolition work helps families in need.

TABLE OF CONTENTS

TABLE OF CONTENTS	2
EXECUTIVE SUMMARY.....	3
BACKGROUND.....	4
PROJECT RESULTS AND ACHIEVEMENTS.....	5
VISIBILITY.....	11
LESSONS LEARNED.....	12
NEXT STEPS	13
FINANCIAL STATEMENT	14



EXECUTIVE SUMMARY

On 25 April, a 7.8 magnitude earthquake struck Nepal with an epicentre near Gorkha district. Two weeks later, a second major quake struck followed by hundreds of aftershocks measuring over 4.0 on the Richter scale. Out of 75 districts in Nepal, 31 districts were affected; 14 of which were heavily damaged. Decades of unsustainable development, the prolonged political transition, weak compliance with building codes and regulations, as well as chronic vulnerabilities and remaining pockets of poverty, have all contributed to exacerbate disaster risks in this seismically-active region. The earthquakes caused widespread death and property damage including 8,790 deaths (55% female), 22,300 injured, approximately eight million affected, nearly 500,000 houses destroyed and over 250,000 houses partially damaged¹.

Upon the request of the Government of Nepal, and in order to extend rapid assistance in the relief and recovery process, UNDP partnered with the Ministry of Federal Affairs and Local Development (MoFALD) to carry out livelihoods support through safe debris management and demolition in three hardest-hit earthquake-affected Village Development Committees (VDCs) in Sindhupalchowk district. The project was implemented under the existing framework of MoFALD's national flagship programme, *Local Governance and Community Development Programme* (LGCDP).

When the second major earthquake hit Nepal on 12 May, with its epicenter in Sindhupalchowk district, UNDP was on the ground already engaging a team of 17 community members with emergency employment in debris management and demolition.

Key Results by 31 December 2015

- National capacity enhanced on safe debris management and demolition by training 105 civil engineers with the guidance of five highly-experienced international demolition experts. Out of which, 82 engineers were further developed as United Nations Volunteers through on-site trainings and regular mentoring. These trained national engineers were deployed in project locations and successfully supervised the debris management and demolition of private and public buildings;
- Out of 4,060 structures were assessed as requiring demolition, 3,625 buildings are safely demolished (including 163 public buildings) and over 294,000 cubic metres of debris managed (the majority of which was recycled and reused) to facilitate the initiation of reconstruction work;
- A total of 4,293 (42% female) community members directly benefitted from immediate livelihood stabilization through emergency employment on livelihoods recovery through cash-for-work;
- An innovation tool launched to digitalize our work through a customized mobile application in partnership with the Microsoft Innovation Center of Nepal. The application is a real-time online portal that helped UNDP maintain transparency and accountability of cash for work initiatives and demolition work through digitalized assessment, worker registration, worker payment, reporting and beneficiary surveys. The application continues to evolve into a world class product for future worldwide application.

¹ *Nepal Earthquake Post-Disaster Needs Assessment, June 2015*

BACKGROUND

Nepal is the 11th most earthquake-prone country in the world². The last major earthquake of a magnitude 8.4 in 1934 resulted in more than 10,000 deaths in the Kathmandu Valley. Most of the infrastructure and major heritage sites were damaged and thus had to be rebuilt. There have since been earthquakes causing severe human and physical loss in 1980, 1988 and 2011³.

The 25 April earthquake and subsequent major aftershocks caused over US\$7 billion in damage and losses, according to the Post-Disaster Needs Assessment findings. The loss of infrastructure was massive with over 500,000 houses and public buildings destroyed and a further 250,000 structures damaged. The rubble and debris impeded accessibility in affected areas. Rural areas in the central and western regions were particularly devastated and further isolated due to road damage and obstructions. In the worst hit areas, entire settlements were destroyed.

The disaster brought to the fore the inherent inequities of urban versus rural, rich versus poor, and other structural inequalities. Rural areas have been more adversely affected than cities due to weak quality of houses, and widespread poverty. According to the World Bank's simulations, the disaster will push an additional 2.5 to 3.5 percent of Nepalis into poverty in FY 2015-2016, which translates into at least 700,000 additional poor people.

Sindhupalchowk was one of the worst earthquake affected districts in Nepal⁴. The destruction was widespread with damage to over 90 percent of residential buildings and a large number of public structures such as health facilities (hospitals and health posts), schools, VDC offices and service centers, rural roads, and water supply systems. Earthquake debris posed a clear danger to the people staying in unprotected settlements and evacuation centers, while reconstruction required the clearance of rubble.

Furthermore, the majority of the agricultural and informal sectors were severely affected in Sindhupalchowk, particularly in the three selected VDCs. Women comprised the bulk of the workforce in these sectors. Thus, widespread loss of food stocks, potential loss in crop productivity and loss of livestock created a severe income shock for the community general, particularly women.

With over 20 years of experience assisting Nepal to develop the policy, legal and operational frameworks for community-led development, disaster preparedness and effective local governance, UNDP co-lead the Early Recovery cluster assisting the Ministry of Urban Development (MoUD) and Ministry of Federal Affairs and Local Development (MoFALD). Globally, UNDP has a proven track record of successful safe debris clearance and management. Utilizing the generous contribution of US\$1 million from the Government of Japan, UNDP quickly undertook demolition and debris management, and provided immediate economic relief for people living in Sindhupalchowk district.

The expected outputs of the project were the following:

1. Safe removal and treatment/reuse of debris/waste in an environmentally sound manner from key earthquake affected areas achieved
2. Solid waste management improved in at least three earthquake-affected districts

The key components of the Project are as follows:

² UNDP 2009

³ PDNA 2015

⁴ PDNA 2015

- Capacity development
- Technical assessment of damaged infrastructure
- Procurement of tools
- Safe debris management, demolition and disaster waste management
- Livelihood support and financial sustainability through the cash-for-work scheme
- Innovation to digitalize debris management and demolition work for efficiency and transparency
- Partnerships with central and local government bodies and other stakeholders for ownership



Women played a vital role in the debris clearance and demolition of their communities. As many of the affected livelihoods are predominately held by women, providing emergency employment to women was crucial to bridging the economic gap created by the earthquake.

PROJECT RESULTS AND ACHIEVEMENTS

Upon a formal request from the Government of Nepal to assist in debris management, demolition and disaster waste management in three Sindhupalchowk VDCs, UNDP through resources mobilized from the Government of Japan quickly deployed 82 United Nations Volunteers with civil engineering backgrounds, five international demolition experts and procured hand tools to immediately start the work on the ground. The Project quickly established camps in Irkhu, Kunchowk and Karthali, mobilized community workers, managed debris, and conducted safe demolition with assistance of the local authorities.

UNDP Hub	Area Covered	Number of Engineers Deployed
Sindhupalchowk District		
Irkhu Camp 1,2 and 3	Irkhu VDC	22
Karthali Camp,1, 2 and 3	Karthali VDC	30
Kunchowk Camp 1, 2 and 3	Kunchowk VDC	30
Kathmandu, Project Office	All	3 Professional Management Staff

Key Results Achieved:

Activity	Key Results
Assessment of structures	4,060
Number of community people who benefitted from cash for work	4,293 (42% women)
Number of buildings safely demolished and debris managed	3,625 (including 163 public buildings)
Cubic metres of debris managed	294,279

Critical Structures Assessed Protecting Communities from Safety and Environmental Hazards

UNDP deployed 82 national civil engineers and completed structural assessments of damaged buildings. The majority of structures were private houses of rural communities. Damaged private and public structures created a high risk to the safety of the population who were residing in those buildings or in open spaces next to the damaged structures. Communities were expressing challenges in initiating reconstruction work due to limited land availability and also unavailability of resources, equipment and technical know-how to demolish their buildings.

The teams assessed the severity of the damage of each structure, and the technical and safety measures required for demolition. Through the assessment, UNDP and local government authorities identified 3,912 structures in three districts that required immediate demolition.

The most pressing need at that moment was to make space for temporary shelters giving people facing safety hazards a safe alternative to staying inside unsafe structures. Also, demolition of public building to provide timely and immediate service delivery to affected communities. With a large and frequent number of aftershocks, there was an urgent need to demolish structures that weakened with each tremor.

National Capacity Strengthened on Safe Debris Management, Demolition and Disaster Waste Management

Prior to the disaster, Nepal had lacked adequate expertise on safe debris management, demolition and disaster waste management, particularly on the scale that was needed following the earthquakes. It was crucial to rapidly train teams of engineers to undertake structural assessments and demolitions. Through an intensive training in safe debris management, demolition and disaster waste management, 105 young Nepali engineers received rapid and thorough instruction from international demolition experts.



Engineers learned demolition theory in a classroom setting prior to deployment into the field.

Out of the 105 engineers trained, UNDP mobilized 82 engineers in partnership with the United Nations Volunteers Programme (UNV). The UNV engineers received on-the-job training and specialized workshops by international demolition experts. These engineers successfully supervised the demolition and debris management of private and public buildings. These trained national engineers transferred components of their technical knowledge to 4,293 community people engaged in debris management, demolition and waste management through the cash-for-work scheme.

UNDP also enhanced the capacity of local government bodies and ministries through technical assistance. International demolition experts worked in close coordination with national authorities and contributed in developing demolition guidelines. The guidelines were endorsed by the Government of Nepal and used as a guiding document by national and international agencies involved in demolition. UNDP also assisted subnational governments to assume their full leadership role in planning and management of the recovery, through debris management, demolition and waste management. With technical backstopping of UNDP experts, local authorities were placed at the fore of the recovery of livelihoods. Local bodies selected workers, and planned, monitored and implemented the activities. This enhanced the relationship between the state and its citizens by utilizing an inclusive and participatory approach to the recovery process at the local level. The financial and logistics management capacity of local authorities was improved with on-site advisory assistance, paving the way for management of future issues.

Bridging the economic gap through cash-for-work

UNDP provided 4,293 (42% women) people with short-term employment within the most-affected communities through debris management and demolition work. Beneficiaries were paid a daily wage under the cash-for-work scheme, applying the rates determined by the District Wage Fixation Committee following the cash-for-work guideline approved by MoFALD. Members of the community who had an utmost need of economic support were identified by the ward citizens forums and local governing bodies. Upon the completion of debris clearance and demolition work, the workers were paid in cash.

The selected cash-for-work (CfW) beneficiaries were put into teams (17 members per team) for demolition and debris clearance and were provided with necessary tools and safety equipment. They were supervised by trained national civil engineers and international demolition experts. The community also received all the hand tools (shovels, picks, wheelbarrows) as they will be useful for the reconstruction of community buildings, schools and other community infrastructure.

UNDP ensured that women and people from excluded groups were adequately represented throughout the project cycle, from planning to beneficiaries' selection and supervision of debris management and demolition work. UNDP employed 1803 female workers. As this was an inclusive process, UNDP found that following the clearance, workers expressed that while the money they earned was important; they also said that they gained a sense of empowerment and psychological relief from the trauma of the disaster. They reported that it was good for the community to band together, fix their problems and rebuild their lives. Through UNDP's emergency employment, communities were able to bridge the economic gap while encouraging ownership of the ground-level work in restoring their communities.



UN Volunteer engineers plotted out the camp area in Irkhu.

While the majority of UNDP's work focused on private houses and public structures, the demolition of one religious structure had a widespread impact. A heavily damaged monastery was assessed and demolished safely. The Lama reported that the clearance directly affected the lives of 1,000 community members in Irkhu because the temple was a significant feature in the local environment.

Recycling and Reusing Debris

UNDP successfully demolished 3,625 buildings and managed 294,279 cubic metres of debris, clearing space to initiate reconstruction. Through recycling and reusing the debris such as stones, cement, rebar, steel and wood, UNDP contributed to not only saving funds that would otherwise go into the reconstruction, but contributed to the preservation of natural resources. UNDP successfully reclaimed nearly US\$3 million worth of recyclable material that would have cost an estimated US\$8-11 million to replace.

What could not be salvaged was used for aggregate; 28 metric tonnes of rubble was used to rebuild and reinforce land on exposed slopes, to line roads making them stronger against weather conditions and more durable, and to reinforce retaining walls of reclaimed land. This is known as *intelligent demolition* and resulted in creating more space in remote and difficult terrain for reconstruction. This paved the way to make the areas not only more stable, but it allowed the possibility of building back a better, safer structure because there was more space.

Strengthened Partnerships Resulting in Comprehensive Restoration of Livelihoods



Some of the most vulnerable community members, like this blind man in Kunchowk, received help in clearing dangerous structures allowing them to reconstruct new shelter quickly.

At the national level, UNDP worked in partnership with the Ministry of Federal Affairs and Local Development (MoFALD) and in close coordination with the Ministry of Health and Population (MoHP), Ministry of Urban Development (MoUD), Ministry of Education (MoE), District Disaster Reduction Committee, the UN (specifically UNICEF & WHO for the provision of temporary learning centres and health posts after UNDP-led demolition and clearance) and other national and international agencies working on service delivery, reconstruction, rehabilitation and safe demolition.

Interventions will and have been integrated with other existing programmes of UNDP such as the Micro Enterprise Development Programme (MEDEP) to establish economic resilience, the

Comprehensive Disaster Risk Management Programme (CDRMP) to assist in building back better and the Community Infrastructure Program (CIP) to provide vital public services such as water points, government offices, market places, etc. All of this contributes to providing sustainable and integrated assistance to communities in a manner that improves their resilience.

At the district level close, partnership arrangements were put in place with Ward Citizen Forums⁵, DDC, VDC, Municipalities, Management Committees of schools, health facility managers and more. UNDP partnered with the Global Emergency Group (GEG) and the Swedish Civil Contingency Agency (MSB) in mobilizing technical assistance.

Innovation in Managing Recovery Processes

UNDP in partnership with the Microsoft Innovation Center (MIC) developed and rolled out an innovative digital interface for the debris management and livelihoods initiatives. The application is a real-time online portal that helped UNDP maintain transparency and accountability. The application has five services:



The Microsoft application made registering, assessing and reporting more transparent and easier for the workers.

⁵ In the absence of local elected government, the ward citizen forum established by the Ministry of Federal Affairs and Local Development for civic oversight, local level planning, implementation and monitoring of activities.

- Tracking total number of houses and number of houses to be demolished
- Worker registration
- Worker payment
- Beneficiary survey
- Reporting



UN Volunteer engineers were mentored in debris and demolition technical expertise while creating a sense of a Nepal-led response to recovery.

UNDP with technical assistance of MIC trained national and international engineers deployed in the field in use of the application. Microsoft smart phones with the pre-loaded application, was distributed to each of the 82 engineers through which the engineers were able to digitally record damage assessments, register workers and take daily attendance by swiping registration cards with unique quick response (QR) codes provided to 4,293 workers, develop a matrix of workers attendance for payment and use that data for reporting. It is also a good tool for management oversight and monitoring. The result is a chronological record of UNDP work and the ability to show statistics by

location, gender, number of members per household, etc.

UNDP is globally recognized for this innovation and was awarded at the UNDP global management meeting held in Malaysia in October 2015. UNDP has continued using this application while demolishing public buildings in Sindhupalchowk, Kavrepalanchowk and Nuwakot.

Safety and Security

Special attention was given to safety and security during the demolition and debris management with provisions of protection equipment, first-aid training and deployment of medical volunteers by the Red Cross. The project strictly followed the Demolition Guideline of the Government of Nepal and standard operating procedures developed by UNDP on safety and security and also monitored its implementation. All the community members engaged in the project interventions were orientated on safety measures.

Greater awareness on safe debris management, demolition and disaster waste management through print, electronic and social media

In order to generate greater public awareness on safe debris management, demolition and disaster waste management, UNDP produced and distributed 20,000 leaflets and posters with pictorial messages. Animated short videos were developed and broadcast on national television and social media. The videos focused on measures to be adopted while demolishing buildings during the monsoon season. Similarly, public service announcements were aired on national radio for a month to sensitize the public on safe debris management and

demolition. The materials produced by UNDP were widely distributed nationwide by different humanitarian clusters. The audience reached by these campaigns are in the millions.

VISIBILITY



Logos were vital to increase the visibility of UNDP's partnerships and ensure transparency and confidence in the community.

In order to promote to key local actors and to the general public UNDP and the Government of Japan's support and efforts to help earthquake affected communities, UNDP implemented a number of visibility measures. These measures include the production of stickers carrying the logos of UNDP and Ministry of Federal Affairs and the Japanese flag, which were placed on all cash-for-work tools and personal protective equipment (PPE) used during debris clearing and management operations in the field. Banners, t-shirts and caps were distributed to community workers and social mobilizers with the logo of the Government of Japan, MoFALD and UNDP.

UNDP and its partners produced stories and videos of the work conducted. The communications products were shared on UNDP web platforms and external social media sites like YouTube. Below is a list of stories and links to the online versions.

Video: UNDP and Microsoft aid disaster recovery in Nepal

<https://www.youtube.com/watch?v=3o7lRK9TWEU>

Story: UN and Microsoft aid disaster recovery, economic development in Nepal

<http://www.np.undp.org/content/nepal/en/home/presscenter/articles/2015/09/30/un-and-microsoft-aid-disaster-recovery-economic-development-in-nepal/>

Video: The Urgency of Early Recovery Support in Nepal

https://www.youtube.com/watch?v=XBn8sHIQ_Fo&feature=youtu.be

<https://www.youtube.com/watch?v=PdrPWIRU4os>

Story: The Monastery Story:

<http://www.np.undp.org/content/nepal/en/home/presscenter/articles/2015/07/13/undp-helps-restore-communities-through-debris-management/>

Story: Saving Schools in Sindhupalchowk through debris management

<http://www.np.undp.org/content/nepal/en/home/presscenter/articles/2015/09/04/saving-schools-in-sindhupalchok-through-debris-management/>

LESSONS LEARNED

1. In disaster response, it is important to focus on the areas of most urgent need. For UNDP it was truly the people of the remote regions who were undoubtedly the worst affected of all. Therefore, at the initial phase of the project, UNDP in coordination with the Government of Nepal focused on private houses by engaging community people for debris management and demolition. However, during the project implementation it was also realized that it is equally important to focus on public buildings, such as schools, health posts, and government offices. Clearance of debris to initiate the reconstruction was vital for timely service delivery to affected communities. Other UNDP projects provided replacement facilities to restore vital public services.
2. Introducing innovation by digitalizing the debris management work in partnership with the Microsoft Innovation Center helped to enhance reliability, efficiency and transparency of the project. The application also supported in timely payment to communities' that helped UNDP and local government authorities enhance communities' confidence. The same tool is being used by other programmes of UNDP on reconstruction and livelihoods supports. There are many opportunities to build upon this pilot project with myriad applications in UNDP's work globally. However, due to remoteness and inefficient tele-communication mode, internet connection was one of the key challenges encountered by the UNV engineers to synchronize the data to central server.
3. UNDP's socially-inclusive approach to worker selection, by empowering local and district level authorities and communities in the selection process, directly contributed to an equitable and fair distribution of opportunity that mitigated conflict. During the period of crisis, when the local government was not fully functional and communities suffering from psychologically trauma and loss of livelihoods, the project was seen as a driving force to uplift these communities from their current loss. Engagement of community people in planning and implementation of the programme, including their involvement in actual debris clearance and demolition work in community restoration. In addition, a cash for work model of aid delivery brought a great impact on the lives of these beneficiaries by providing immediate employment contributing to livelihoods enhancement.
4. Engagement of national UNVs with civil engineering background was one of the strategic decisions made by UNDP in developing a pool of national experts on debris management, demolition and waste management. A total of 82 national engineers were continuously trained and mentored in different aspects of debris management, demolition and disaster waste management. They are now equipped with required skills to lead similar initiatives on their own capacity.
5. It was a great lesson for UNDP that the planning of debris management and demolition and its effectiveness depends on the geographical setting and context. Nepal's terrain is complex and with the majority of the affected areas situated in the hills, responders had limited access to roads. Scattered settlements of damaged houses and communities further complicated the logistical considerations. Many of these settlements were only accessible by walking, which presented a challenge for the movement of

both people and heavy equipment. The work was done by hand without machinery, which worked well in this case, but is a consideration for planning similar assessment and demolition work going forward.

- Demolition is the first step in recovery planning. Political issues aside, it appeared that very little thought has gone into the removal of damaged structures for rebuilding. It is important that the GON control the demolition process to ensure that valuable recyclables are retained or distributed to the population in order to limit profiteering from the disaster.

NEXT STEPS

While giving continuity to debris management and demolition of private and public buildings of Sindhupalchowk district, UNDP in partnership with development partners has expanded its work in Nuwakot, Kavrepalanchowk districts with a focus on the restoration of livelihoods and public service delivery through demolition and debris management of public structures.

Damaged public structures include health facilities, schools, District Administration Offices, Village Development Committees (VDCs), District Development Committees (DDCs), municipalities and Agriculture Service Centres, police posts/offices, courts, etc. The health and education sectors represent a major portion of local infrastructure and are among the worst-affected sectors, with some 80-90 percent of local public buildings in these sectors. With the limited or no availability of open land in the affected areas, demolition and debris management is the first step for rebuilding health facilities, learning centres and other facilities and helping communities get back to normal operations with better facilities and resilience than before. Damaged structures have also limited Government effectiveness and efficiency to provide services to the citizens in need.

Damaged Public Buildings		
District	Estimated debris m ³	# of buildings
Sindhupalchowk	571,200	476
Nuwakot	477,600	398
Kavrepalanchowk	342,000	285
Total	1,083,000	1159

UNDP is in the process of mobilizing additional resources to give continuity to work initiated in three most affected districts. Nevertheless, in order to give continuity to work initiated at local level, the project will further integrate complimentary programs to create an all-inclusive solution that builds the resilience of affected communities in a manner that reduces the likely impact of a future disaster. The project will continue its focus on cash-for-work modality in the restoration of community infrastructure and micro enterprise development to provide an integrated solution to address poverty through livelihoods assistance.

FINANCIAL STATEMENT

A. TOTAL PROGRAMME BUDGET FOR PHASE I: USD 1.9 M

CONTRIBUTION FROM JAPAN: USD 1.0 M

CONTRIBUTION FROM UNDP: USD 0.9 M

CONTRIBUTION FROM GEORGIA: USD 0.1

B. CONTRIBUTION FROM JAPAN: USD 1.0 M

ACTUAL EXPENDITURE FROM JAPAN: USD 1.0 M

Budget Description	Expenditure
Cash for Work for Livelihood Support	347,415.00
UNV Engineers	54,000.00
Vehicle Rental and Hand Tools for Safely Demolition.	349,500.00
Shelters/storage for Engineers	45,609.00
Public Sensitization on Safe Demolition	-
Capacity Building	16,775.00
Personnel Cost (Deputy Project Manager, Assistant Finance Officer, Programme Assistant and Drivers)	26,880.00
IT Equipment and Furniture	74,125.00
Travel	9,020.00
Miscellaneous	2,602.00
GMS	74,074.00
Total	1,000,000.00

