NEPAL EARTHQUAKE 2015

Post Disaster Needs Assessment

EXECUTIVE SUMMARY

GOVERNMENT OF NEPAL
NATIONAL PLANNING COMMISSION
KATHMANDU 2015

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Background

Nepal is the 11th most earthquake-prone country in the world.[1] Ever since the first recorded earthquake of 1255 AD that killed one-third of the population of the Kathmandu Valley and its King, Abhaya Malla, Nepal has experienced a major earthquake every few generations. The last great earthquake (of magnitude 8.4) in 1934 AD resulted in more than 10,000 deaths in the Kathmandu Valley. Most of the infrastructure and major heritage sites had to be rebuilt. There have since been earthquakes causing severe human and physical loss in 1980, 1988 and 2011.

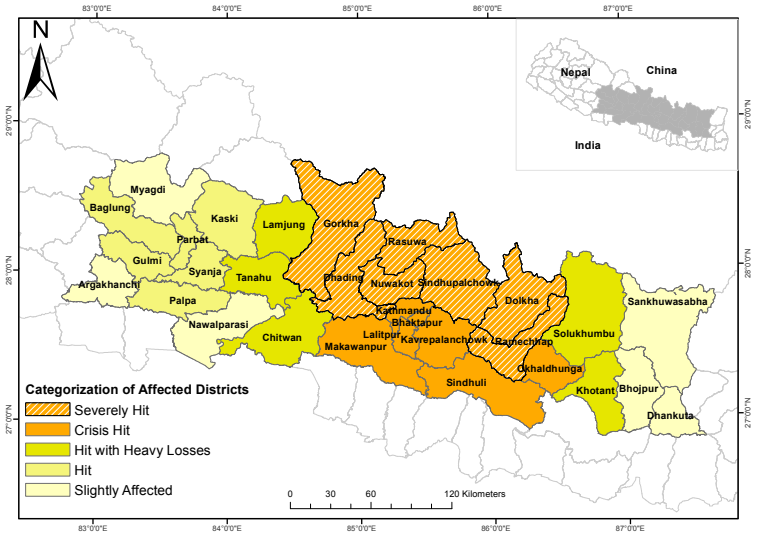
On Saturday, 25 April 2015 at 11:56 local time, a 7.6 magnitude earthquake as recorded by Nepal's National Seismological Centre (NSC), struck Barpak in the historic district of Gorkha, about 76 km northwest of Kathmandu. Nepal had not faced a natural shock of comparable magnitude for over 80 years.

The catastrophic earthquake was followed by more than 300 aftershocks greater than magnitude 4.0 (as of 7 June 2015). Four aftershocks were greater than magnitude 6.0, including one measuring 6.8 which struck 17 days after the first big one with the epicentre near Mount Everest. To date, there are over 8,790 casualties and 22,300 injuries. It is estimated that the lives of eight million people, almost one-third of the population of Nepal, have been impacted by these earthquakes. Thirty-one of the country's 75 districts have been affected, out of which 14 were declared 'crisis-hit' (see Figure 1) for the purpose of prioritizing rescue and relief operations; another 17 neighbouring districts are partially affected.

The destruction was widespread covering residential and government buildings, heritage sites, schools and health posts, rural roads, bridges, water supply systems, agricultural land, trekking routes, hydropower plants and sports facilities. The geodetic network centres including horizontal and vertical control points have been damaged in a manner that will affect reconstruction planning. 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, including popular tourist destinations like Langtang, were swept away by landslides and avalanches triggered by the earthquakes. Due to the weakened, ruptured, and destabilized slopes and surfaces, the vulnerable areas have now become even more susceptible to flooding and landslides that can occur during the monsoon.[2]

Hundreds of historical and cultural monuments at least a century old were either destroyed or extensively damaged. Over half a million houses were destroyed. The damage exposed the weaknesses of houses that did not have any seismic-resistant features or were not in accordance with the building codes. The disaster also highlighted aspects of inequities in Nepali society spanning geography, income and gender. Poorer rural areas have been more adversely affected than towns and cities due to their inferior quality of houses. More women and girls died than men and boys, partly because

FIGURE 1: CATEGORIES OF EARTHQUAKE-AFFECTED DISTRICTS



Source: GoN/MoHA as of 21 May 2015

[1] UNDP (2009)

[2] American Geophysical Union.

of gendered roles that disproportionately assign indoor chores to women.

The time and day the first earthquake was experienced saved thousands of lives. Being a Saturday, the weekly holiday, schools across Nepal were closed on 25 April. The death toll of young people could have been much higher considering that nearly 7,000 schools were completely or significantly damaged. Similarly, if the earthquake had struck at night, and not in the middle of the day, there would certainly have been greater casualties.

Relief Operations and External Assistance

The Government of Nepal (GoN) made an official request for international assistance within hours of the 25 April earthquake. Nepal's National Disaster Response Framework (NDRF) served as a key tool for coordination of earthquake response, facilitating decisions and instructions from the central government. The first meeting of the Central Disaster Relief Committee (CDRC) was held two hours after the first earthquake, with the National Emergency Operation Centre (NEOC) providing an initial report to the CDRC recommending a focus on Search and Rescue (SAR), and lifesaving actions. Financial resources from the Prime Minister's Disaster Relief Fund were immediately allocated, and the government's Cluster mechanisms, comprising 11 sectors, were instantly activated.

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Several donor meetings were convened to seek international assistance for search and rescue and immediate relief operations. Though Nepal did not have an integrated national search and rescue capacity formed prior to the event, the trained human resource of the Nepal Army (NA), Nepal Police (NP) and Armed Police Force (APF) carried out effective SAR, despite several limitations. The Indian National Disaster Response Force (NDRF), Indian Air Force and Indian Army Medical Corps were the first foreign contingents to land in Kathmandu within hours of the disaster to help launch relief operations.

Over time, 134 international SAR teams from 34 countries responded to Nepal's request for help. The Ministry of Home Affairs (MoHA) reported that "for SAR, 4,236 helicopter flights were used (GoN/private), with 7,558 persons rescued by air and 4,689 persons rescued by land." More than 90 percent of the security forces were mobilized to focus on SAR. Overall, 22,500 civil servants, 65,059 staff of the Nepal Army, 41,776 staff of Nepal Police and 24,775 staff of the Armed Police Force, as well as 4,000 government and private health workers were mobilized to aid rescue and relief efforts.

Emergency relief and humanitarian assistance to the affected population was provided with the active support of and contribution by over 60 countries as well as the United Nations and other international agencies. Fixed wing and rotary aircrafts from friendly countries were engaged in carrying out numerous sorties to bring relief supplies into the country and to distribute them in remote areas. A newly constructed humanitarian staging area at the Tribhuvan International Airport (TIA) facilitated the receipt of cargo by air and by truck immediately after the earthquake so that distribution around the country could commence.

A UN flash appeal for support was launched on 29 April 2015 for a sum of US$ 422 million to meet critical humanitarian needs for the following three months. Till date, US$ 129.1 million or 31 percent of the appeal has been met.[3]

Transit shelters were established immediately in Kathmandu with official support in designated public spaces. However, the supply of non-food items, particularly tarpaulins, proved inadequate as the fear of being trapped drove many families, including those whose houses had not been damaged, to seek temporary shelter in the open.

As is typical in disasters, community members particularly youths were galvanized into action, digging out neighbours from the rubble, and providing whatever assistance they could before the arrival of rescue and relief teams. Local governments were also hamstrung, having been under-staffed for years and working without any elected officials. Many local authorities lost family members and their houses were destroyed as well. Furthermore, the remoteness of several villages in the affected areas, coupled with poor weather, hampered relief operations during the initial days. Many district level offices providing public services were severely damaged or reduced to rubble, as a result of which many of-

[3] OCHA (2015)

ficials started functioning out of tents and temporary shelters.

The network of NGOs and local affiliates of INGOs based in Nepal swiftly rallied to support community rescue and relief efforts. Several volunteer groups, especially of youth and professionals like doctors and engineers, were active in treating the wounded, setting up temporary shelters, supplying food and attending to vital needs.

Disaster Effects

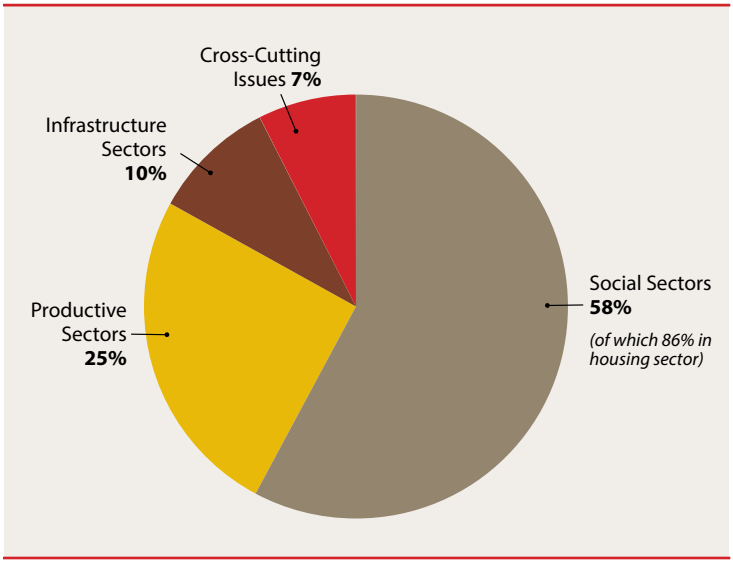
The humanitarian challenge became immediately apparent as millions of people whose houses were either destroyed and those who were fearful of imminent aftershocks started camping out in the open. This put a tremendous demand on the government and philanthropic associations for materials to erect makeshift shelters and to supply essentials. More than a month after the disaster, tens of thousands of people are still reported to be living either in temporary or transitional shelters in spaces presumed to be safe from landslide and rain. The distribution of relief materials proved challenging because of the remoteness of many villages, rugged terrain, threat of landslides, and logistical difficulties. In the earliest days, when the coordinating authority of the District Administration Offices had yet to be fully asserted, there were also duplication and imbalance in the supply of relief materials benefiting the more accessible villages disproportionately.

TABLE 1. SUMMARY OF DISASTER EFFECTS

	Disaster Effects (NPR million)			Distribution of Disaster Effects (NPR million)		Losses in personal income (NPR million)
	Damages	Losses	Total	Private	Public	
Social Sectors	**355,028**	**53,597**	**408,625**	**363,248**	**45,377**	**-**
Housing and Human Settlements	303,632	46,908	350,540	350,540	-	-
Health	6,422	1,122	7,544	1,394	6,150	-
Education	28,064	3,254	31,318	2,365	28,953	-
Cultural Heritage	16,910	2,313	19,223	8,948	10,274	-
Productive Sectors	**58,074**	**120,046**	**178,121**	**158,079**	**20,043**	**17,124**
Agriculture	16,405	11,962	28,366	25,813	2,553	4,603
Irrigation	383	-	383	-	383	
Commerce	9,015	7,938	16,953	16,953	-	2,667
Industry	8,394	10,877	19,271	19,271	-	3,654
Tourism	18,863	62,379	81,242	75,105	6,137	6,200
Finance	5,015	26,890	31,905	20,937	10,969	-
Infrastructure Sectors	**52,460**	**14,323**	**66,783**	**17,281**	**49,502**	
Electricity	17,807	3,435	21,242	15,569	5,673	-
Communications	3,610	5,085	8,695	1,712	6,983	
Community Infrastructure	3,349	-	3,349	-	3,349	-
Transport	17,188	4,930	22,118	-	22,118	
Water and Sanitation	10,506	873	11,379	-	11,379	-
Cross-Cutting Issues	**51,872**	**1,061**	**52,933**	**1,755**	**51,178**	**-**
Governance	18,757	-	18,757	-	18,757	-
Disaster Risk Reduction	155	-	155	-	155	-
Environment and Forestry	32,960	1,061	34,021	1,755	32,267	-
Total	**517,434**	**189,027**	**706,461**	**540,362**	**166,100**	**17,124**
Total (US$ million)	**$5,174**	**$1,890**	**$7,065**	**$5,404**	**$1,661**	**$171**

Source: Estimations by PDNA Team

FIGURE 2: SHARE OF DISASTER EFFECTS ACROSS SECTORS



Source: Estimations by PDNA Team

Subsistence-based households are badly affected in rural areas as the earthquake hit Nepal only a few weeks prior to the start of the paddy planting season. An overwhelming majority of the estimated losses and damages have been to private property such as residential buildings, commercial buildings, farmland, and livestock. Public property, such as roads, schools, utilities, heritage monuments, and hospitals, have also suffered damage in severely affected districts. According to UNFPA, about a million children and more than 1.4 million females of reproductive age live in the 14 districts; and approximately 138,000 of the female population are or will be pregnant in the next 12 months. Of this figure, 18,600 will need obstetric care.

It is estimated that the total value of disaster effects (damages and losses) caused by the earthquakes is NPR 706 billion or its equivalent of US$ 7 billion

It is estimated that the total value of disaster effects (damages and losses) caused by the earthquakes is NPR 706 billion or its equivalent of US$ 7 billion. Of that amount, NPR 517 billion (or 76 percent of the total effects) represents the value of destroyed physical assets, and NPR 189 billion (24 percent of the total effects) reflects the losses and higher costs of production of goods and services arising from the disaster (see Table 1). These estimates are based on the aggregation of information and data collected across sectors of social and economic activity and checked to avoid duplication of numbers.

The relative distribution of effects, that is, damages versus losses – is typical of disasters caused by natural events of geological origin, whereby the larger fraction of disaster effects represents the destruction of physical and durable assets.

The share of estimated total disaster effects among the main sectors of social and economic activity (see Figure 2) reveals that the most affected are social sectors (58 percent of the total effects), which includes housing. This is followed by productive sectors (25 percent), infrastructure (10 percent) and cross-cutting issues (7 percent).

When considering individual sectors of social and economic activity, the distribution of disaster effects provides direction to the recovery and reconstruction strategy (see Figure 3). The most affected sector, housing and settlements, sustained about 50 percent of the destruction and production decline caused by the disaster, followed by tourism at 11 percent. The environment, education, finance and agriculture sectors represent between 4-5 percent each of the total disaster effects.

The effects of the disasters illustrate that the estimated value of total damages and losses (changes in flows) is equivalent to about one third of the Gross Domestic Product (GDP) in FY 2013-2014. In addition, the estimated value of damage is equivalent to more than 100 percent of the Gross Fixed Capital Formation (GFCF) for FY 2013-2014. To put it differently, if all other capital formation activities were stopped, it would take Nepal more than one year to rebuild the fixed capital that was destroyed by the earthquakes. Furthermore, the estimated production losses represents about 10 percent of the added value of all goods and services produced in one year in the country, which will result in a slowdown of the economy in the short term, despite the fact that the estimated losses for some sectors like cultural heritage and environment, among others, would unfold over several years.

Disaster effects are spread unevenly between public and private sectors. The private sector has sustained about 3.3 times the value of damages and losses in comparison with the public sector (see Figure 4), which provides a first indication of the relative efforts that each sector must invest during recovery and reconstruction. While the government plans to utilize most of its resources to assist the poorer strata and rural population

to revive the social and productive sectors, it is critical to ensure availability of finance through banking and non-banking institutions including cooperatives for the recovery of the private sector.

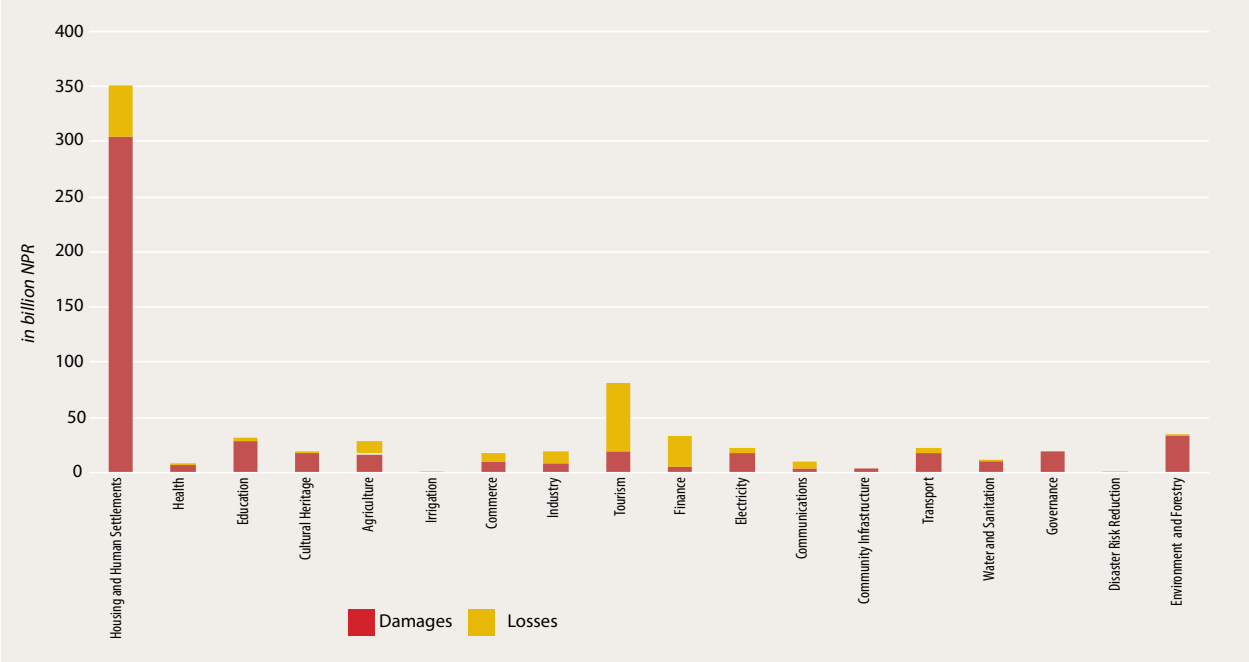
With the exception of the Kathmandu Valley, the central and western regions that have been affected by the earthquake are essentially rural. They are heavily dependent on agriculture for livelihood, which the earthquakes and the ensuing landslides have damaged. Furthermore, these districts have a generally higher per unit livestock than the national average, indicating that the widespread loss of livestock, which is another main source of income for rural households, will potentially cause a severe income shock in the short term. Some of the affected districts such as Gorkha have a skewed female population due to male out-migration, which means women will take on a larger responsibility of rebuilding sectors like agriculture and livestock. These rural districts also face a wide revenue-expenditure gap, suggesting the need for transfer of funds to meet the local development and reconstruction tasks in the years ahead. Further, they account for about 20 percent of strategic road networks and 23 percent of total schools. About a quarter of total hydroelectricity generated in the country is also affected by the earthquake.

The 14 worst-affected districts have a particularly high absentee population, which migrates overseas for jobs, and their remittances constitute an important share of household incomes. Tens of thousands of workers have returned from overseas to help reconstruct their houses in the quake-affected areas. The enhancement of entrepreneurial skills and physical connectivity of the affected areas to market centres, within and outside the district headquarters, is critical, considering that the severely affected districts together account for 30 percent of the total cottage industries in the country. Restoration as well as rebuilding of earthquake-resistant school buildings and community centres will also be equally important to support both learning in a secure environment and to help the local authorities to efficiently manage resources and relief operations at times of emergency.

Poverty and Human Development

Consumption based poverty – defined as the percentage of Nepalis living below the national

FIGURE 3: DISASTER EFFECTS ACROSS SECTORS



Source: Estimations by PDNA Team

The earthquakes will end up pushing an additional 2.5 to 3.5 percent Nepalis into poverty in 2015-2016 which translates into at least 700,000 additional poor

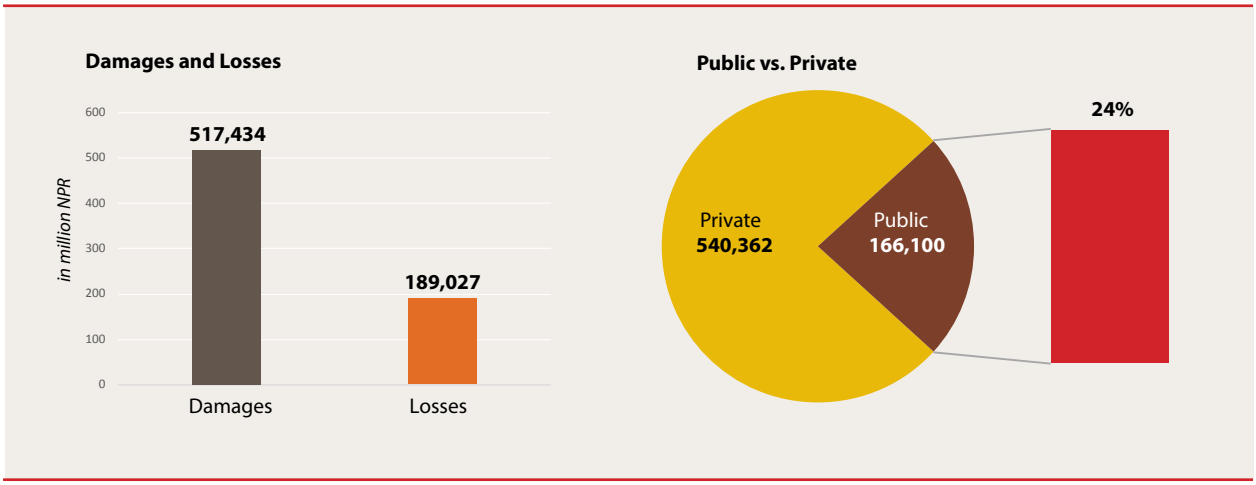
poverty line of Rs.19,261 (per person per year) – stood at 25.2 percent in FY 2010-2011 which represents a spectacular decline from when poverty was measured using similar data in FY 1995-1996. However, the earthquake has exposed one of the weaker aspects of the poverty reduction experience in the country, namely the high degree of vulnerability.

Preliminary assessment of incidence and impact suggests that the earthquakes have disproportionately affected the poorer, rural locations relative to the urban and less poor areas. Even within the relatively prosperous areas that have been affected, for example the Kathmandu Valley, households that were already either poor or vulnerable have been particularly exposed. According to the World Bank's simulations, the earthquakes will end up pushing an additional 2.5 to 3.5 percent Nepalis into poverty in FY 2015-2016 which translates into at least 700,000 additional poor. Roughly 50 to 70 percent of the increase in poverty will come from rural central hills and mountains where overall vulnerability prior to the earthquake was already high. Additionally, the deterioration of water and sanitation services, disruption of schools and health services, and the possible increase in food insecurity may lead to a bigger impact on multidimensional poverty.

Nine of the 14 severely affected districts have human development index (HDI) scores lower than the national average, indicating their lagging status in average income, education and health outcomes. The population in the lowest two income quintiles is likely to be particularly affected. The loss of poorly built residential houses, farmland and livestock will amplify the income shock and push poor households below the poverty line for an extended period if reconstruction and rehabilitation activities are delayed. The geographical disaggregation of disaster effects will have negative impacts on individual households, decreasing personal capital and incomes. Such impact includes losses in equivalent employment and in imputed personal income to the tune of NPR 17,124 million (see Table 1). Further, an analysis of the data for each affected district, in combination with the data on population, reveals that the average values of disaster effects per person range from a high of NPR 255,860 per person in Dolakha to NPR 43,800 in Makawanpur, with an average of NPR 130,000 per person across the 14 most-affected districts (see Table 2).

The pre-disaster HDI in the country was 0.491. The data included in Table 2 reveals that the poorer population residing in the six lowest-HDI districts that witnessed disaster effects above NPR 130,000 per person are in Dolakha, Sindhupalchowk, Gorkha, Nuwakot, Rasuwa and Dhading, which confirms that the poorest and the most vulnerable people usually sustain the worst impact of disasters. Further, the inhabitants in the higher-HDI districts of Kathmandu, Lalitpur, Bhaktapur, Kavrepalanchowk

FIGURE 4: DISTRIBUTION OF DISASTER EFFECTS



Source: Estimations by PDNA Team

and Makawanpur sustained disaster effects lower than the average value of NPR 130,000 per person. These facts, coupled with the distinction between the urban and rural economy of such districts, need to be taken into consideration in the formulation of the recovery and reconstruction strategy in view of the differential impact felt by the population of each district.

Gender Equality and Social Inclusion

The disadvantaged social groups in the poorer districts have suffered the largest damage and loss. The majority of the agricultural and informal sector workers are female due to the low capital entry requirement of the informal sector and lack of livelihood options. The widespread loss of food stocks, potential loss in crop productivity and loss of livestock as well as small scale enterprises will likely cause a severe income shock for women who rely on this sector.

A narrow asset base, burden of domestic work, limited access to economic resources combined with the lack of alternate livelihoods also mean that recovery for women may take longer than for men who have more livelihood options. Dalits and other marginalized groups, and people living in remote geographical regions who are already deprived of access to social services, will face similar challenges.

The housing sector, which is the hardest hit, has a bearing on gender equality and social inclusion. Women, Dalits and some ethnic groups have limited ownership of land, which could hinder their participation in the housing recovery programme and the benefits accruing from them. Senior citizens, female-headed households and people living with disabilities (PLWDs) have also been heavily affected as many do not have the means to reconstruct their houses.

The destruction of water supply and sanitation facilities will have a direct negative impact on women and girls as they will now have to fetch water from greater distance. The work burden on women, and the disproportionate cost borne by them in the household economy, not only limits the time they can spend in economic activities but restricts them spatially and culturally to activities that are compatible with their domestic obligations.

TABLE 2. PER CAPITA DISASTER EFFECTS AND PRE-DISASTER HDI IN MOST-AFFECTED DISTRICTS

District	Per capita Disaster Effects, NPR/ person	HDI
Dolakha	255,860	0.459
Sindhupalchowk	233,370	0.455
Gorkha	209,080	0.481
Nuwakot	204,930	0.466
Rasuwa	179,700	0.461
Dhading	149,580	0.461
Kavrepalanchowk	119,200	0.520
Ramechhap	112,740	0.468
Bhaktapur	78,770	0.573
Okhaldhunga	74,500	0.468
Sindhuli	57,865	0.440
Lalitpur	52,765	0.601
Kathmandu	49,495	0.632
Makawanpur	43,760	0.497

Source: Estimations by PDNA Team and UNDP

Families are deploying different coping mechanisms to deal with the disaster, including distress sales of assets and receipt of remittances. However, for vulnerable families, the loss of assets combined with the loss of family protection, and desperation for alternate livelihoods could have disastrous consequences on women, girls and children who may face heightened risk of sexual and gender-based violence, human trafficking, child marriage, and child labour.

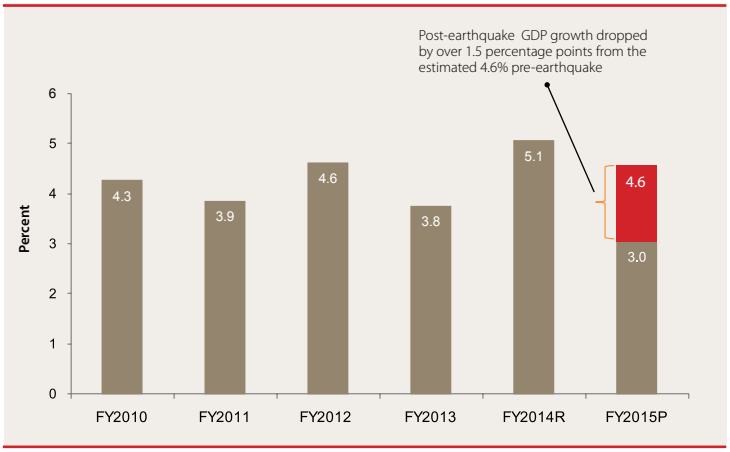
Macroeconomic Impact

After decades of political instability, Nepal had begun gearing up for a higher trajectory of economic growth. The earthquake upsets the nation's high aspirations for swifter economic progress in the short run.

REAL SECTOR

Annual economic growth in FY 2014-2015 is expected to be the lowest in eight years, at 3 percent (basic prices). The earthquakes suppressed an earlier projection of 4.6 percent by over 1.5 points (see Figure 5). Compared to FY 2013-

FIGURE 5: IMPACT ON GDP GROWTH



Source: CBS
Note 1: R (revised); P (projected)

2014, when growth exceeded 5 percent, the lost momentum through foregone production in just less than three months (between late April and mid-July 2015), valued at NPR 52 billion, is a major setback.[4] The losses will continue to accumulate during FY 2015-2016 and beyond until major sectors recover fully (see Table 1).

The economic activity that has been the hardest hit is that of real estate, renting and business services, with annual growth projection revised downwards from 4.8 percent to 0.8 percent. There has been a massive destruction of owner-occupied dwellings[5] and public assets worth over NPR 300 billion. Partly because of their exposure to residential finance and real estate, the banking and financial institutions (BFIs) are likely to see modest deterioration in the quality of loan portfolios, impacting the solvency of institutions, micro and large, and the overall flow of credit. The insurance sector faces claims exceeding NPR 16 billion; a large share of this is re-insured abroad, but local liability remains substantial.

Annual economic growth in FY 2014-2015 is expected to be the lowest in eight years, at 3 percent (basic prices)

In agriculture, the harvest of rice and maize had already been disappointing. What the earthquakes did additionally was to destroy the stockpile of stored grains and devastate the livestock sector, which accounts for over 23 percent of value added in agriculture. The loss of over 17,000 cattle and about 40,000 smaller, domesticated animals has resulted in the downward revision of the projected growth in agriculture from 2.2 percent to 1.8 percent this year.

In services, tourism has been adversely affected with every nine in ten planned foreign arrivals cancelled in the aftermath of the quakes which occurred during the first of the two major seasons of the year. The main earthquake and prolonged aftershocks caused damage to seven out of 10 World Heritage sites in the Kathmandu Valley and affected popular trekking routes. Destroyed tourism-related supply of services and decreased tourist spending are likely to lead to a loss of NPR 62 billion over the next two years. Conditional on low or no seismic activity over the coming months, tourism can rebound somewhat by the autumn, and strongly by next spring's climbing season.

In the social sectors, education is expected to record slower growth because of disruptions spanning several weeks, while the health services sector has recorded a modest uptick in its growth even though it accounts for only 1.7 percent of GDP. The largest contributor to value addition in services comes from the wholesale and retail (trading) industries. There has been an estimated decrease of about NPR 7 billion in the tradable 'margin' of goods after the earthquake within FY 2014-2015. Women are emerging as traders in Nepal, and might have been disproportionately affected in some sectors. Of the 19 export products prioritized in the national trade integration strategy of 2010, women are the primary producers of more than half of them.

A majority of the large manufacturing industries located in the plains were not directly affected. But they have felt the externalities of falling national demand and fleeing workers. Private construction in the immediate aftermath of the quakes came to a halt. In the FY 2015-2016, however, labour demand for demolition, clearing of debris, and reconstruction of destroyed and damaged dwellings and other physical infrastructure will grow. This will increase demand and earnings for skilled and unskilled labour in ancillary industries.

In the electricity sector, as a result of increased water flow, there has been no notable drop in power production after the earthquakes even though about 115 MW of hydropower facilities are estimated to have sustained damage. All the transmission facilities are in operation. How-

[4] The economic impact on GDP, estimated at NPR 31 billion (in basic price), is the difference between the Gross Value Added estimated just prior to the earthquake on April 22 and the revised projection of June 6.

[5] The System of National Accounts (SNA) 1993 defines services of owner-occupied dwellings as "own household unincorporated enterprises that produce housing services for their own consumption." These are included within the production boundary of the SNA.

TABLE 3. SUMMARY OF TOTAL NEEDS

SECTOR	Total Needs (NPR million)	Total Needs (US$ million)	Share of Needs by Sector
Social Sectors	**407,747**	**4,077**	**60.9%**
Housing	327,762	3,278	49.0%
Health	14,690	147	2.2%
Nutrition	5,036	50	0.8%
Education	39,706	397	5.9%
Cultural Heritage	20,553	206	3.1%
Productive Sectors	**115,618**	**1,156**	**17.3%**
Agriculture	15,561	156	2.3%
Irrigation	467	5	0.1%
Commerce	20,051	201	3.0%
Industry	7,357	74	1.1%
Tourism	38,710	387	5.8%
Finance	33,472	335	5.0%
Infrastructure Sectors	**74,266**	**743**	**11.1%**
Electricity	18,586	186	2.8%
Communications	4,939	49	0.7%
Community Infrastructure	4,450	45	0.7%
Transport	28,185	282	4.2%
Water and Sanitation	18,106	181	2.7%
Cross-Cutting Issues	**71,873**	**719**	**10.7%**
Governance	18,442	184	2.8%
Disaster Risk Reduction	8,204	82	1.2%
Environment and Forestry	25,197	252	3.8%
Employment and Livelihoods	12,547	125	1.9%
Social Protection	6,398	64	1.0%
Gender and Social Inclusion	1,086	11	0.2%
Total	**669,505**	**6,695**	

Source: Estimations by PDNA Team

ever, about 800 km of distribution lines at different voltage levels and 365 transformers at different capacity are out of service. For generation plants under construction, about 1,000 MW of hydropower projects, owned both by independent power producers and the Nepal Electricity Authority, have been partially damaged.

FISCAL AND MONETARY SECTORS

Public revenues have taken a direct hit in the aftermath of the quake. It is now certain that the target for revenue collection in the current fiscal year, of NPR 423 billion, will not be met. With only NPR 390 billion expected to be raised by mid-July 2015, there will be a shortfall of about 8 percent. This sets up a much lower base for FY 2015-2016, where the target now is to raise only between NPR 460 and NPR 480 billion against a projection of NPR 512 billion prior to the earthquake. Of the five major sources, customs and those deemed non-tax revenue have seen the largest drop in collection. This is because of reduced imports, including luxurious items such as motorized vehicles. A preliminary debt sustainability analysis indicates that Nepal may be able to maintain its current low debt distress rating. However, close monitoring and concessional support will be needed to cope with the upward pressure.

Broad money is not expected to grow by more than 17.5 percent and inflation is expected to be contained within single digits during FY 2014-2015. However, the differences in sector specific inflation rates will be amplified going forward as demand for reconstruction inputs increase. In FY 2015-2016, as a result of an expansionary budget, and, likely supply-side bottlenecks, an inflationary pressure is expected to build up further. There will also be an upward pressure on wages of both skilled and unskilled workers.

EXTERNAL SECTOR

As a result of the earthquake, export-oriented industries have been damaged. Further, domestic consumption of items that are normally exported have increased, reducing estimated exports by about 6 percent, as compared with the previous year. Imports are likely to expand as a result of increased demand for machinery parts, food, medicines, and construction materials. The fall in the world price of petroleum products checked the growth in import bills this year.

There is an expected surge in both international transfers and remittances. However, the trade imbalance will worsen this year and the next. Exports are unlikely to pick up rapidly because of the uncertain investment climate. Imports are expected to grow by about 18 percent in FY 2015-2016.

The recently secured consensus among the largest political parties to promulgate a new constitution at the earliest adds optimism to efforts aimed at restoring the trajectory of higher economic growth

Overall, the narrative of the Nepali economy is one that has struggled with the challenge of triggering sustained growth, yet was supported by a reasonably comfortable fiscal space and balance of payments (BoP). With the need for rehabilitation and reconstruction looming large, the challenge ahead is to garner resources from within and abroad in a manner that does not strain macro-prudential norms and disciplines on internal and external borrowing. The recently secured consensus among the largest political parties to promulgate a new constitution at the earliest adds optimism to efforts aimed at restoring the trajectory of higher economic growth. A push towards economic reforms has to continue so that the investment climate is friendlier.

Financial Requirements

The nation will require substantial external assistance to meet the rehabilitation and reconstruction costs, estimated to be at least NPR 669 billion or US$ 6.7 billion (see Table 3) over a number of years depending on the sector. Furthermore, the government's revenue growth has slowed down in the short term, as a result of disrupted business activities. The slack in aggregate demand coming from the private sector and the costs to rehabilitate and reconstruct public goods such as schools, hospitals, heritage monuments, roads, energy projects, and water supply systems, among others, will exert substantial pressure on public finances as will announced subsidies to private home owners. There are limits to internal borrowing. To finance the rehabilitation and reconstruction cost, the government has set up a National Reconstruction Fund of NPR 200 billion, to which it has already committed NPR 20 billion.

Towards Resilience

DISASTER RISK REDUCTION AND BUILD BACK BETTER

In the recovery and reconstruction phase it is critical to prevent actions that end up creating disaster risks by increasing public awareness, and investing in the principle of Build Back Better (BBB). Noting the limited priority and resources given to Disaster Risk Reduction (DRR) prior to the earthquake, improvements are urgently needed in the DRR system in Nepal in the short (up to one year), medium (two to three years), and long (four to five years) term to enhance the resilience of the country.

Short-term priorities include:

- reconstruction of damaged DRR assets and improvements on BBB principle;
- measures to improve preparedness, response, relief and logistics systems;
- measures to strengthen information and communication capacities for relief, response and recovery; and
- measures to enhance multi-hazard risk monitoring, vulnerability assessment, risk information dissemination and awareness.

Medium to long term priorities include:

- improvements in legal and institutional arrangements;
- measures to mainstream DRR into the developmental sector, particularly housing, private and public infrastructure, social sectors (health and education), and livelihood; and
- measures to improve integration of climate change adaptation and DRR.

The government will develop a seismic policy and set up a network for seismic monitoring throughout the country, and promote seismological research. The policy will include the revision of building codes, development of building by-laws for all municipal areas, application of Mandatory Rule of Thumb (MRT) in rural areas, and development of risk-sensitive land use plans for all the municipalities of the country. The recovery programme must make Nepal more earthquake-resistant. Along with seismic policies, the government will implement a number of DRR measures targeting secondary disasters. It will undertake risk assessment which provides a basis for mitigation measures at the community level. As part of the recovery programme, the government will support early warning and preparedness measures and support strengthening and retrofitting of schools and hospitals that are critical to risk reduction in Nepal. To effectively mainstream DRR in development planning, the government will also undertake a number of measures to strengthen disaster risk governance.

PATHWAYS TO RECOVERY

As the earthquakes in Nepal have left a large part of the country shaken, the need for recovery is immediate and urgent. People have already initiated their efforts for recovery, and they expect the government to help in the process as quickly as possible. As the government prepares to develop a large-scale recovery programme on the basis of the PDNA results, there is a widely shared realization that it has to be a multi-pronged effort with a strong orientation towards the poorest and the most vulnerable. While the government would plan, organize and facilitate the recovery programme, it has to be supported by other sectors of Nepali society and economy— the private sector, NGOs, and international development partners.

The total recovery needs of NPR 669 billion or US$ 6.7 billion take into account the cost of reconstruction with better specifications, equipment, improved governance and risk reduction. While calculating the recovery needs, it does not consider the replacement value, particularly with respect to the housing sector. It specifies a core house with a minimum area as the recovery need, and estimates the total needs on the basis of the cost of construction per square feet.

In view of exceptionally huge recovery needs, the government would need to undertake a sustained effort to mobilize financial resources. As is the case in most recovery programmes, the resources would be pooled through several windows of funding: own resource mobilization including budgetary reallocations, grants from multilateral and bilateral agencies, contributions from the private sector and citizens, loans from IFIs, and reallocations from existing project portfolios. The resources would be pooled in a way that it would keep the debt ratio within manageable levels, and utilize grants assistance to the extent possible.

A recovery programme involves implementing a large number of activities in a relatively short period of time, which requires enormous preparation in institutional, financial and logistical terms to support implementation. It also calls for relevant technologies, regulations, and innovations to meet the demands arising from the extremely dynamic context of the recovery programme. The objective is to promote the principle of BBB in recovery and reconstruction. Given the recurrence of disasters and vulnerability of the country, it is only appropriate that recovery and reconstruction should be implemented in a way that it contributes to the resilience of the country, reflected in its economy, social cohesion and governance.

There are several aspects of recovery which can be implemented only by developing a national consensus. Strong political will, sustained resource mobilization and continuous dialogue with the affected people, are among the most important prerequisites of a recovery programme. The provision of income generating activities, skills development and community mobilization are catalytic for swift recovery and enhanced resilience. In addition to existing institutional arrangements of the government's social assistance programme for vulnerable groups, cash transfers will be essential to support vulnerable single women and widows, PLWDs, Dalits, disadvantaged groups, and children from households that have suffered catastrophic economic losses.

Women and marginalized groups have unique capacities to drive resilience building of communities, given the right support. Overall, women's dominance in the agricultural and informal sector means that they will play a critical

While calculating the recovery needs, PDNA does not consider the replacement value, particularly with respect to the housing sector. It specifies a core house with a minimum area as the recovery need, and estimates the total needs on the basis of the cost of construction per square feet

Nepal also needs to tap unconventional assets at its disposal such as the growing financial and technical clout of the diaspora, skills of temporary migrants, the spirit of volunteerism of its youth at home and abroad, and new sources of philanthropy

role in the recovery and rebuilding of Nepal if supported appropriately. Equitable economic growth can lead them out of their disadvantaged conditions, increase resilience and lead to higher rates of economic growth. Post-disaster recovery will therefore be more effective and sustainable if gender equality and social inclusion are acknowledged as one of the key guiding principles of implementation.

The recovery strategy would have special focus on the restoration and reconstruction of all damaged and collapsed historic buildings including refurbishment of cultural institutions and museums. Expertise is needed in the fields of structural and seismic engineering, architecture and conservation as well as other areas related to preserving cultural heritage. It will be imperative to rope in specialists in intangible heritage such as anthropologists, art historians, linguists, ethno-musicologists, among others, to investigate losses and help communities identify ways to revitalize their traditions. The impact of investing generously in the preservation and conservation of Nepal's cultural heritage, including capacity building and upgrading of skills and knowledge, will have a positive effect on the intangible culture.

While the earthquake recovery in Nepal will draw upon all the good practices followed in other recovery programmes in South Asia and elsewhere, it has to be developed and implemented in a way that is uniquely Nepali. The people of Nepal have demonstrated considerable resilience in coping with many adversities. Nepal also has a lot of experience in recovery and reconstruction following natural disasters and conflicts in the country. The government will draw upon its own national experiences and resources to support recovery and develop institutions, pools of resources and practices to implement recovery, knowing that the challenges of difficult terrain can be handled by creating strong social capital and effective local governance. Nepal also needs to tap unconventional assets at its disposal such as the growing financial and technical clout of the diaspora, skills of temporary migrants, the spirit of volunteerism of its youth at home and abroad, and new sources of philanthropy.

Post Disaster Needs Assessment: *Process and Methodology*

Process

Within three days of the second earthquake on 12 May 2015, the Government of Nepal convened a meeting of local development partners and called for a Post Disaster Needs Assessment (PDNA) to be carried out under the leadership of the National Planning Commission (NPC). The purpose was to assess the impact of the disaster and define a recovery strategy, including its funding implications, for the restoration of livelihoods, economy and services, rehabilitation and reconstruction of housing and infrastructure to ensure a resilient recovery. The PDNA follows a methodology jointly developed by the European Union, the World Bank and the UN system that incorporates a collection of analytical methods, tools and techniques developed for post-disaster assessments and recovery planning, ensuring sector to sector comparability and homogeneity in the definition of basic concepts of damages, losses and post-disaster recovery needs. The assessment builds on the initial and detailed sector damage assessments undertaken by central and local governments and the clusters established by the government with support from development partners.

A high-level oversight mechanism was set up at the NPC under the leadership of its Vice Chairman, directly assisted by a core group of NPC Members to oversee the preparation of PDNA. Other Members in charge of specific sectors assumed a lead role in coordinating and overseeing the assessment of their respective portfolios. In addition, the NPC also invited a team of distinguished advisors embedded in its Secretariat from Nepal and abroad.

A Core Coordination Team was constituted under the leadership of the NPC, including Heads of Agencies from the following donor partners: the Asian Development Bank (ADB), the European Union (EU), the United Nations (UN/UNDP), the World Bank (WB) and the Japan International Cooperation Agency (JICA). Representatives from these agencies formed the core PDNA Secretariat providing daily guidance to the assessment teams.

Following a two-day workshop on the methodology and scope of the PDNA, over 250 officials and experts from the government and 30 development partner agencies were organized into 23 thematic groups. Each group had a dedicated Joint Secretary assigned from the directly relevant line ministry and the NPC to work together with a lead agency on the part of development partners. These joint teams undertook an intensive exercise of data collection, field visits and verification in just over three weeks, from 22 May to 10 June, a tight timeline, given the scale and magnitude of the disaster.[6] An intermediate milestone for the PDNA report is the presentation of key findings at the International Conference on Nepal's Reconstruction (ICNR) on 25 June.

Methodology

The PDNA for the Nepal earthquakes is an assessment led by the National Planning Commission covering 23 thematic areas as follows:

- **Social Sectors:** Housing, Health & Population, Nutrition, Education, and Cultural Heritage
- **Productive Sectors:** Agriculture, Irrigation, Commerce & Industry, Tourism, and Financial Sector
- **Infrastructure Sectors:** Electricity, Communications, Community Infrastructure, Transport, and Water, Sanitation & Hygiene
- **Cross-cutting Sectors:** Governance, Disaster Risk Reduction, Environment & Forestry, Employment & Livelihoods, Social Protection, Gender Equity & Social Inclusion, Poverty and Human Development, and Macroeconomic Impact Assessment.

The assessment covers 31 districts affected by the earthquakes, of which 14 districts are the worst affected. All the sector teams assessed damages,

The assessment covers 31 districts affected by the earthquakes, of which 14 districts are the worst affected

[6] The PDNA provides informed estimates of the damages, losses and needs in each of the 23 sectors and themes it covers. This is sufficient to show the approximate overall damages, losses and needs, as well as the relative impact between sectors.

losses and needs in these 14 districts. In respect to the remaining districts, they have been covered by the sector teams on the basis of availability of data, which implies that there are variations in geographical coverage across the sectors.

The sector teams conducted the assessment through:

- the collection of pre-disaster baseline data to compare with post-disaster conditions;
- the evaluation of disaster effects and impacts in each sector to determine the overall recovery needs;
- the prioritization of these recovery needs by way of a recovery strategy; and
- a recovery strategy that suggests appropriate interventions to meet priority recovery needs.

Most of the sector teams conducted field visits to assess the destruction of housing, infrastructure and social amenities, and estimate the impact on production of goods and delivery of services. They assessed how the disasters affected governance arrangements and brought out the context of risks and vulnerabilities in each sector. In the course of the assessment, a number of cross-cutting issues such as gender and social inclusion, disaster risk reduction and governance have been addressed. Each sector has also discussed the impact of the disaster in qualitative terms and outlined the emerging issues arising from the disaster.

Most of the sectors have valued the effects, which includes the value of damages to infrastructure and assets, as well as losses due to changes in financial flows, in Nepali Rupees and US dollars. A number of assessments in social and productive sectors have also estimated the household impacts in terms of decline in personal income and access to social services. The values assessed by all the sectors have been aggregated, and the total value of damages and losses caused by the earthquakes has been arrived at. The cross-sectoral linkages have made it possible to avoid double or multiple counting in estimating the value of effects.

The aggregate value of damages and losses as well as qualitative information available through a household survey has facilitated the estimation of economic impact at macro and micro levels, and on human development. Two independent chapters are devoted to the assessment of these impacts.

Furthermore, the national accounts data freshly released by the Central Bureau of Statistics (CBS) were used as a benchmark to guide the assessment of change in flows across 15 major economic sectors.

Based on the estimation of damages and changes as well as qualitative impacts, each sector has specified recovery needs and suggested implementation arrangements. This includes the cost of reconstruction of destroyed assets, provision of services, improved specifications and risk reduction measures. The cost of recovery needs has not been estimated at the replacement value; rather, a cost estimate has been provided on the basis of fiscal prudence and acceptable levels of recovery. The total cost of recovery, which includes the cost of reconstruction of destroyed assets, has been arrived at through aggregation of the cost of recovery needs of all sectors. An overarching strategy has also been suggested for the recovery programme covering all the sectors.

PDNA CORE PARTNERS

GOVERNMENT OF NEPAL
NATIONAL PLANNING COMMISSION
KATHMANDU