

## Executive Summary: Nepal Population Estimates 19th August 2015

For more on methodology, updates and datasets: [www.flowminder.org](http://www.flowminder.org) & [www.worldpop.org](http://www.worldpop.org)

This report provides an extensive update of our earlier reports on movement and displacement patterns in Nepal following the April earthquake and aftershocks. In addition to updated versions of earlier analyses we here show a) longitudinal trends in the estimated number of displaced per district, b) trends in returns among people who left their district after the earthquake, and c) VDC level estimates of displacement and returns for selected districts.

While significantly less people than normal moved into **Kathmandu Valley** after the earthquake, the trend has now been reversed and an estimated 130,000 persons more than expected has come into the Valley since the earthquake. The Kathmandu city centre VDC has received the largest inflows in the Valley.

The majority of districts **outside Kathmandu Valley** received above-normal levels of people after the earthquake. Since mid-July the number of people from other districts have in most districts gradually decreased. Notable exceptions are **Ramechhap** and **Dhading** where the number of people from other districts has increased since mid-July.

In all districts, most people who left the district early after the earthquake have now returned (between 4-14% have not, depending on district). Most of these returns took place shortly after the earthquake. Contrary to expectations, **Sindhupalchok, Rasuwa, Ramechhap, Gorkha and Dhading** have the smallest proportion of people who have not yet returned. However large parts of these districts have no mobile coverage and are therefore excluded from analyses.

Underlying data files will shortly be available on [www.worldpop.org](http://www.worldpop.org) and HDX.

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## Nepal Population Estimates as of 19th August 2015

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## Additional information

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The Flowminder team pioneered the analysis of mobile network data to support responses to natural disasters and epidemics (Zanzibar 2009 malaria, Haiti 2010 earthquake and cholera outbreak). WorldPop is the leading open data repository for population densities and distributions, and is Flowminder's main dissemination platform.

Nepal has 23 million mobile phone subscribers out of a population of 27 million people. Ncell has a market share of 56% (Ncell). For these estimates we analyze the movements of de-identified Ncell SIM cards which made or received at least one call pre- and post-earthquake. The former criterion excludes relief workers arriving after the earthquake, while the latter excludes SIM cards that were lost or destroyed in the earthquake.

Population movement estimates are calculated by combining de-identified data on SIM card movements with available population data. Changes in mobility pattern are identified by comparing SIM card movements before and after the earthquake to normal pre-earthquake movements. This is done through the estimation of pre-earthquake 'home locations' and comparison of these locations between a pre-earthquake baseline period (1 Jan to 7th April 2015) and the present (13th-19th August). Estimated normal movements (based on the pre-earthquake period) are subtracted. Mobile phone use is relatively lower in several groups including women, children, the elderly, and the poorest. If these groups have substantially different movement patterns than groups with high mobile phone use, results will be biased. In general the relative distributions of flows across the country are more reliable than absolute numbers given per area. Our previous field projects in Haiti and Kenya show that overall estimates of mobility corresponded well to population-level data [2-3], but the estimates provided here should be interpreted with the above mentioned caveats in mind. Population mobility due to the monsoon season is also likely to influence these results.

[1] Ncell

[2] Bengtsson et al. (2011) *Improved response to disasters and outbreaks with mobile phone data: a post-earthquake geospatial study of Haiti*

[3] Wesolowski et al. (2013) *The impact of biases in mobile phone ownership on estimates of human mobility*

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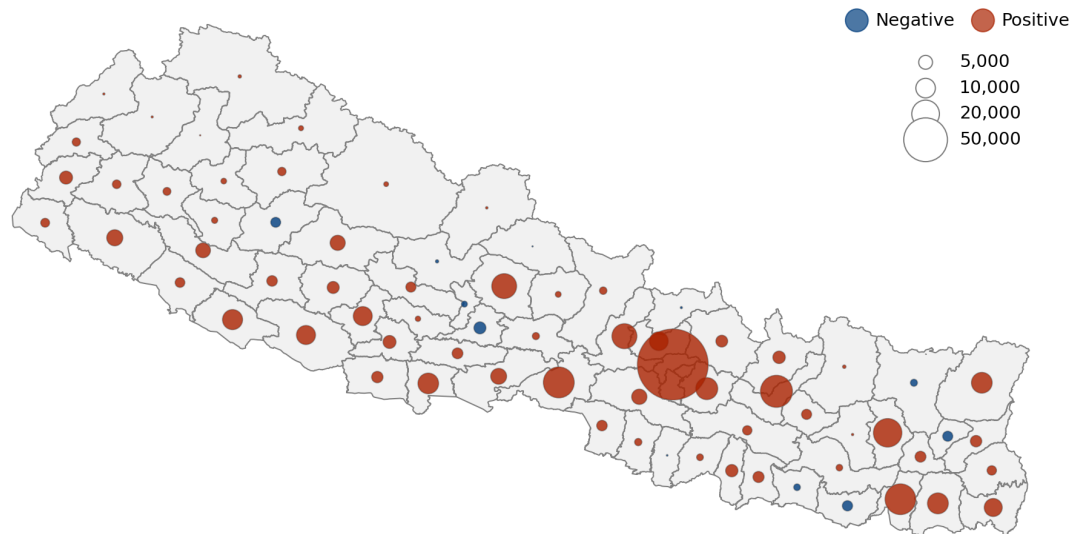
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## National Overview 19 August 2015

### 1. Overview

District	Population	Inflow above normal	Ratio (%)
Kathmandu	2,760,000	131,000	4.7
Ramechhap	218,000	26,600	12
Dhading	361,000	16,200	4.5
Kavrepalanchok	404,000	12,500	3.1
Nuwakot	297,000	9,030	3
Makwanpur	448,000	5,990	1.3
Dolakha	199,000	3,980	2
Sindhupalchok	308,000	3,570	1.2
Okhaldhunga	159,000	2,610	1.6
Sindhuli	315,000	2,230	0.71
Gorkha	290,000	1,390	0.48
Rasuwa	45,800	-99	-0.22

## Above normal inflow to each district (negative numbers indicate less incoming people than expected)



FLOWMINDER.ORG

world  
pop

Population flows between districts are large under normal conditions. Here we present, for each district as of 19 August, the estimated above-normal number of people inside each district, who have homes in other districts and moved from their home district sometime after the earthquake. Inflows to a district are composed of people leaving their home district to come into the new district and Nepalese relief workers (relief workers coming into Nepal after the earthquake are excluded). The table to the left presents the absolute numbers for key districts.

[1] [www.worldpop.org](http://www.worldpop.org)

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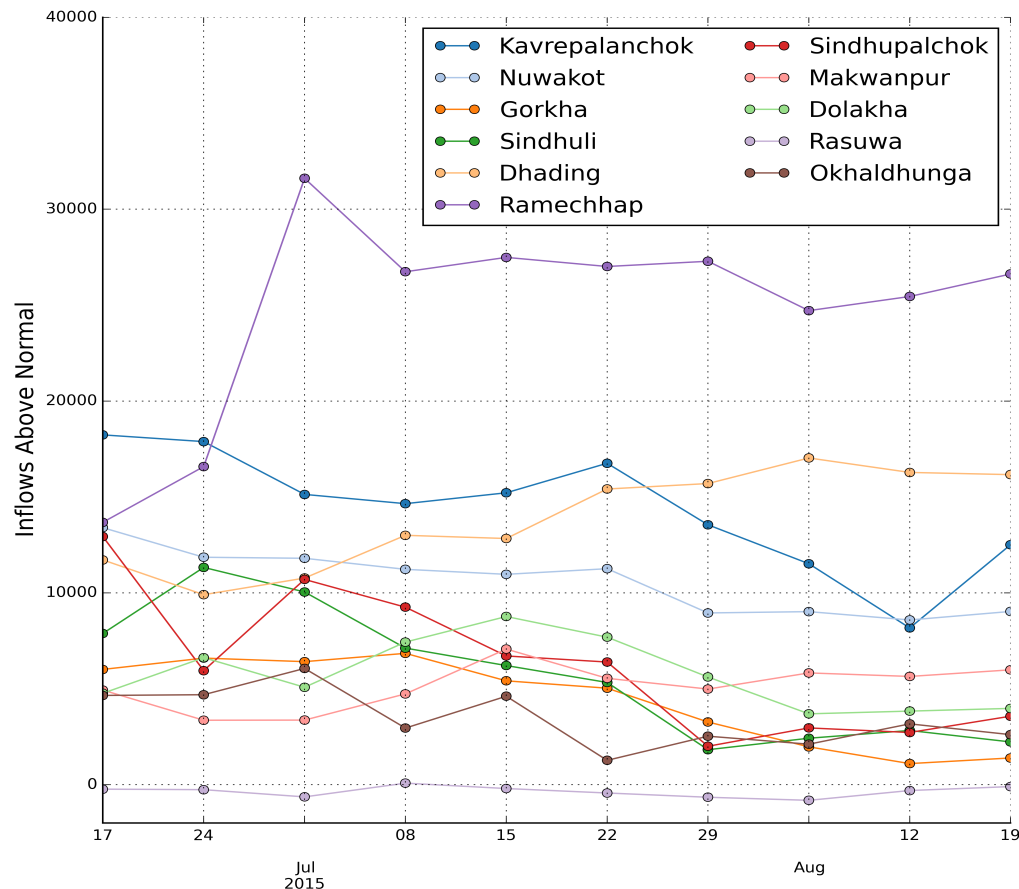
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## Trends: Incoming Persons from other Districts

The previous slide shows the estimated above-normal number of people inside each district who have homes in other districts (as of 19 August). Here we show how these numbers have changed over time. Seasonal movements may contribute to the patterns.

- Immediately after the earthquake on 25 April many people left **Kathmandu Valley** (not shown, see earlier reports), driven by return to villages and fear of aftershocks (Ekantipur 16/06/2015). Concurrently fewer people than normal moved into the Valley. Inflows into the Valley increased significantly from mid-May (not shown). The number of persons in the Valley with pre-earthquake homes outside is now 130,000 persons higher than expected (based on pre-earthquake movements patterns). This may be due to people moving to work in reconstruction, to access support services in the Valley but may also be seasonal.
- The majority of districts **outside Kathmandu Valley** received people after the earthquake. Since mid-July the number of people from other districts have in most districts, gradually decreased (right).
- A notable exception is **Ramechhap** (right) where the number of people from other districts has increased sharply (by an estimated 25,000 persons since the beginning of July). An increasing trend can also be seen in **Dhading** (an estimated 15,000 individuals above expected levels). Kavrepalanchok saw an increase during last week after an earlier decrease.



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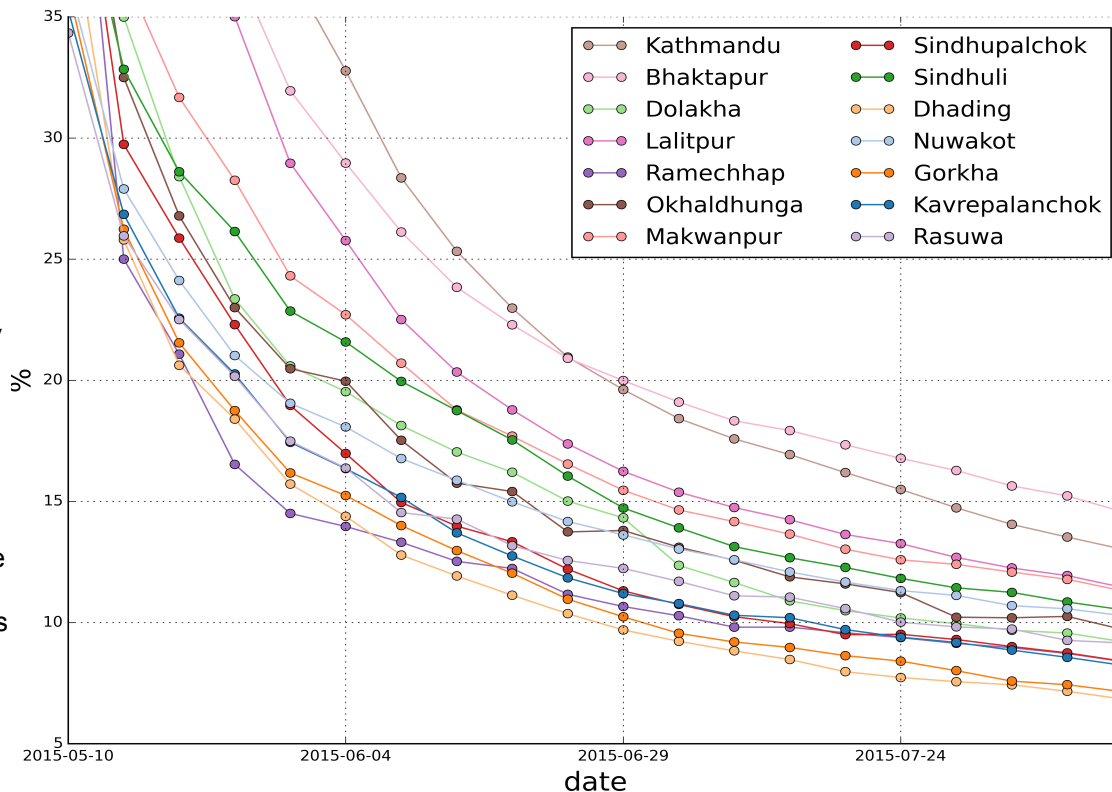
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## Trends: Proportion of People who Remains Away

This analysis shows, for people who left their home districts during the first two weeks after the earthquake, the proportion who had not yet returned at consecutive times after the earthquake. Details on specific districts are available in slides below.

- Most people who left early after the earthquake have now returned (4-14% have not). Most of this return took place early.
- There are clear differences between districts. People from the Kathmandu Valley districts have returned more slowly than those from other districts. This is likely partly caused by this group under normal conditions making longer travels than people from rural districts.
- Contrary to expectations, districts north of the Kathmandu Valley, including Sindhupalchok, Rasuwa, Ramechhap, Gorkha and Dhading, showed the fastest relative rate of return after the earthquake and now have the smallest proportion of people who have not yet returned. Note that these analyses only addresses areas with mobile radio coverage.
- Okhaldhunga's return rate has a slight reversion in late June and an increase in late July. Recent noticeable fluctuations also include an increase in returns to Dolakha from late June - early July.



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## Kathmandu Population Estimates 19th August 2015

Kathmandu Valley is home to 2.8m people under normal conditions [1].

### Key findings:

- An estimated 63,000 people more than expected had left Kathmandu Valley after the earthquake (ratio to the population 2.3%).
- An estimated 130,000 persons more than normal had come into Kathmandu during the same period (ratio to the population 4.7%).
- Abnormal flows from Kathmandu were directed towards many districts; but are particularly apparent to the surrounding districts of Nuwakot, Dhading and Ramechhap as well as to the district of Inaruwa to the South-East of Nepal.

Pre-earthquake population

**2.8m**

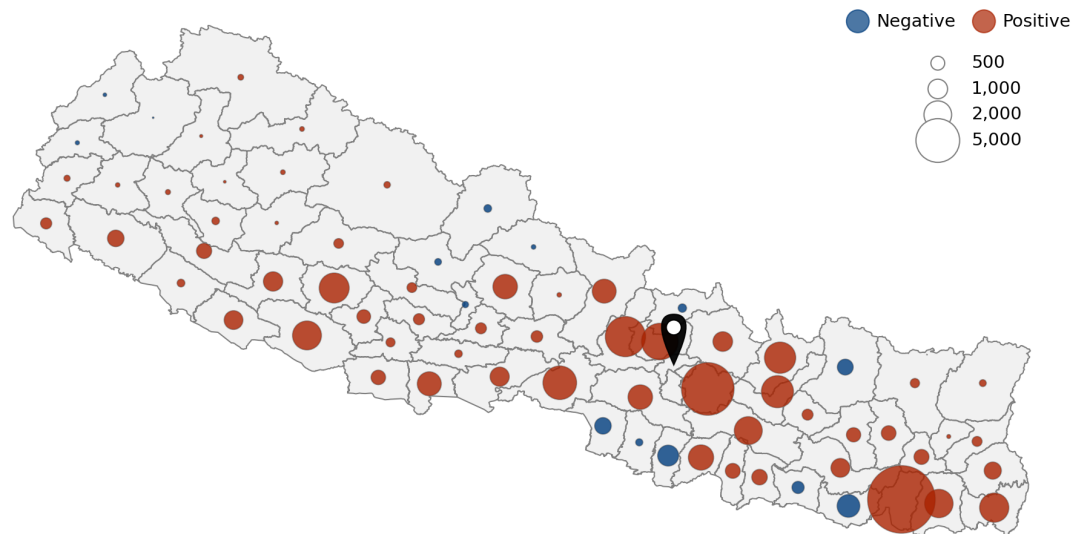
Population outflow  
(above normal)

**+63,000**  
(38,000 ~ 88,000)

Population inflow  
(above normal)

**+130,000**  
(80,000 ~ 180,000)

### Above normal flows from Kathmandu Valley to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

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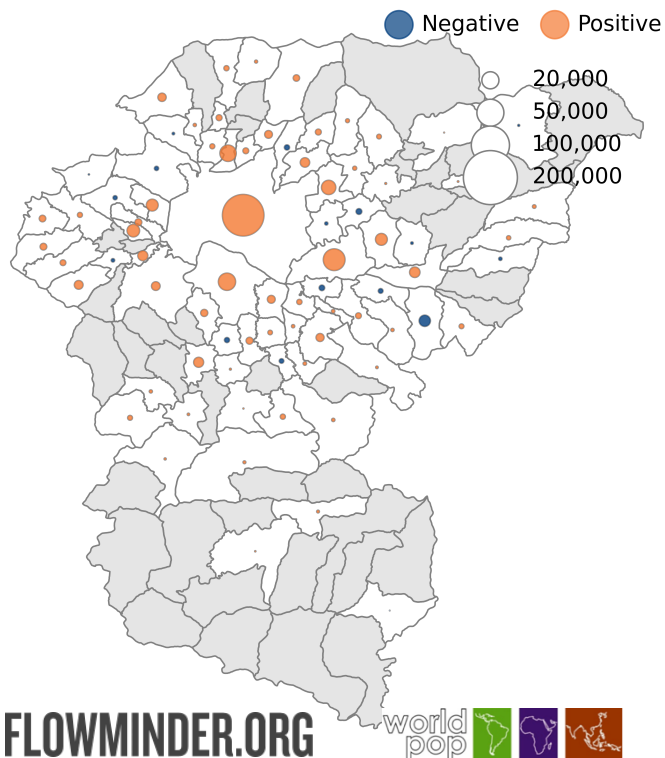
Above normal flows from Kathmandu to other districts, as of  
19 August 2015

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## Kathmandu Population Estimates 19th August 2015

## Flow Analysis

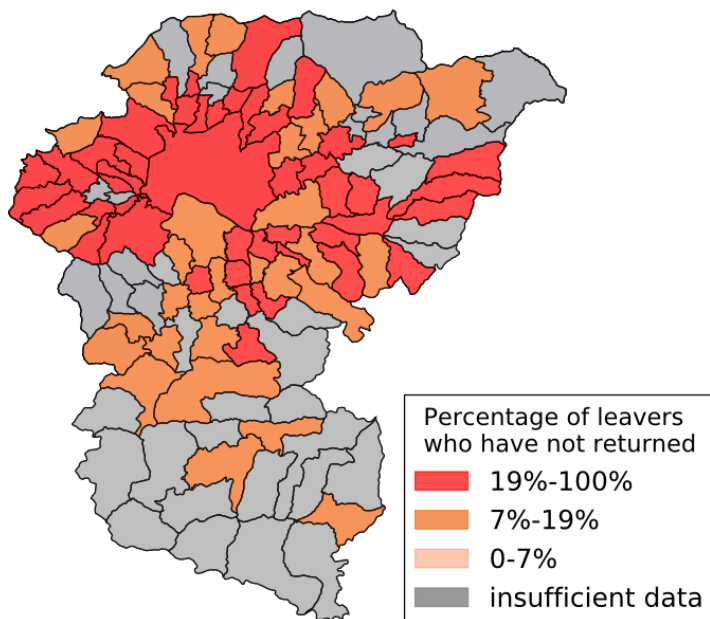
Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.



## Kathmandu

- The largest inflow is to the city centre of Kathmandu itself. VDCs neighbouring the city centre also show relatively large inflows.
- There are noticeable negative flows in several southeastern VDCs from the city centre. This suggests avoidance of these areas.

## Kathmandu Population Estimates 19th August 2015



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## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned

### Kathmandu

- Kathmandu has high levels of people still away from home, with an average percentage per VDC of 21%.
- VDCs of particular concern are Sirutar (46%), Syuchatar (46%), Sudal (42%) and Naikap Purano (40%).
- 41 VDCs are excluded from the analysis due to insufficient data, partly due to ongoing replacement of radio towers.

Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly. Data for some VDCs is too small to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.

## Dhading Population Estimates 19th August 2015

Pre-earthquake population

# 360,000

Population outflow  
(above normal)

# +2,200

  
(1,300 ~ 3,100)
Population inflow  
(above normal)

# +16,000

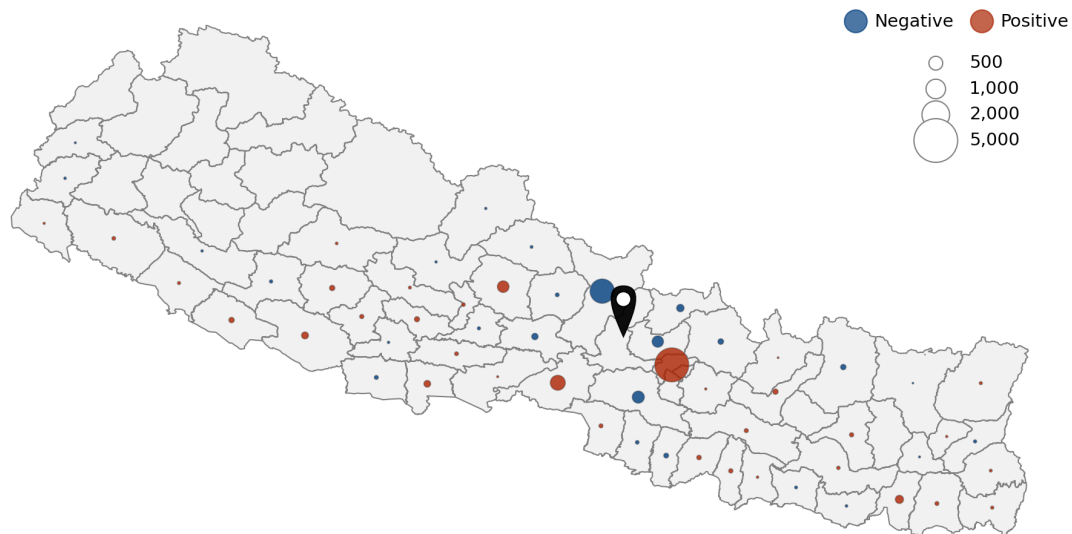
  
(10,000 ~ 22,000)

Dhading district is home to 360,000 people under normal conditions [1].

### Key findings:

- An estimated 2,200 people more than expected had left Dhading after the earthquake (ratio to the population 0.61%).
- An estimated 16,000 persons more than normal had come into Dhading during the same period (ratio to the population 4.5%).
- Flows to most regions are close to normal levels, but there is a particularly pronounced above normal flow to the Kathmandu valley, and a decreased flow to Gorkha.

### Above normal flows from Dhading to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

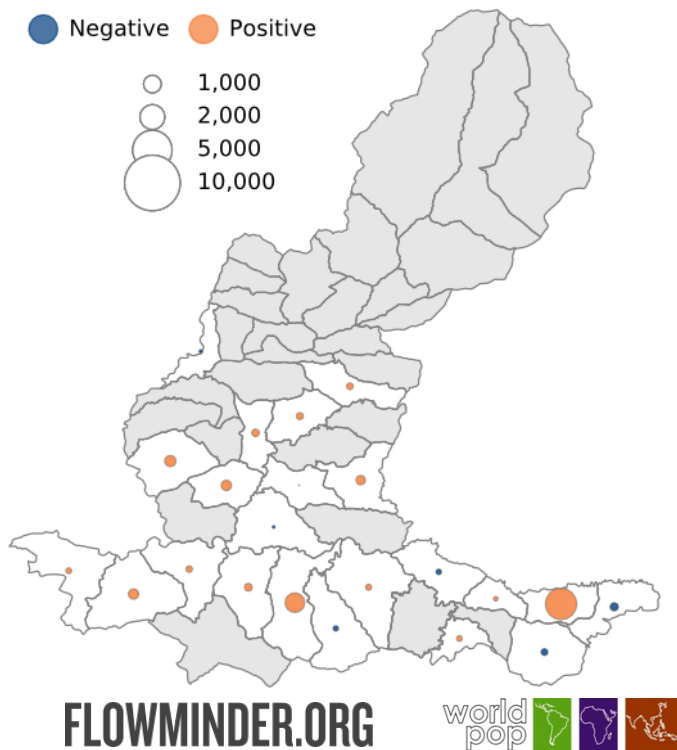
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Above normal flows from Dhading to other districts, as of 19 August 2015

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## Dhading Population Estimates 19th August 2015



## Flow Analysis

Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.

## Dhading

- Many VDCs in this south and centre of this district have inflows above normal.
- The largest inflow is to Jeewanpur, close to the Kathmandu Valley border.

[1] [www.worldpop.org](http://www.worldpop.org)

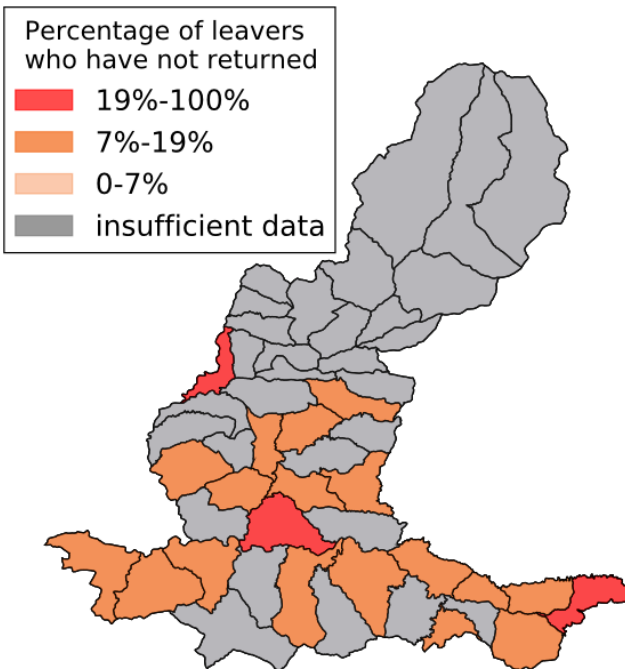
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## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned

### Dhading

- Dhading has high levels of people still away from home. The mean percentage away is 14%.
- VDCs of particular concern are Chhatre Deurali (25%) SalyanTar (24%) and Kumpur (20%)
- 30 VDCs are excluded from the analysis due to insufficient data.

Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly. Data for some VDCs is too small to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.

## Dolakha Population Estimates 19th August 2015

Pre-earthquake population

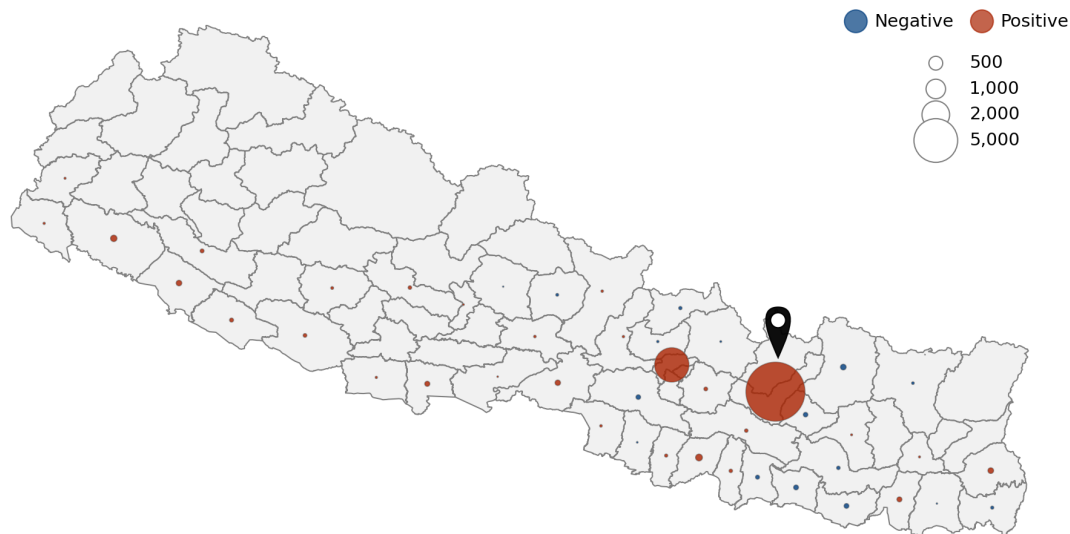
**200,000**
Population outflow  
(above normal)
**+13,000**  
(8,000 ~ 18,000)
Population inflow  
(above normal)
**+4,000**  
(2,400 ~ 5,600)

Dolakha district is home to 200,000 people under normal conditions [1].

### Key findings:

- An estimated 13,000 people more than expected had left Dolakha after the earthquake (ratio to the population 6.3%).
- An estimated 4,000 persons more than normal had come into Dolakha during the same period (ratio to the population 2%).
- Flows to most regions are within normal levels with the exception of relatively large flows to neighbouring Ramechhap and to a lesser extent the Kathmandu valley.

### Above normal flows from Dolakha to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

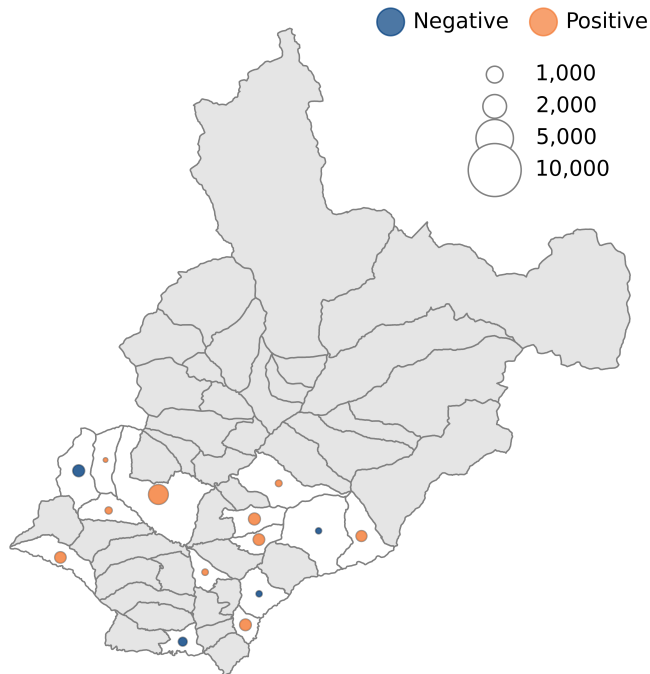
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Above normal flows from Dolakha to other districts, as of 19 August 2015

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## Dolakha Population Estimates 19th August 2015



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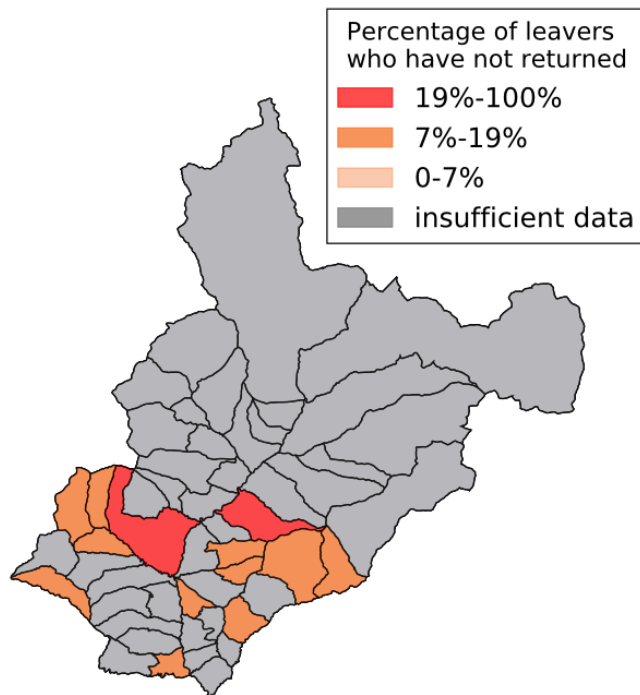
## Flow Analysis

Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.

### Dolakha

- Several populated areas in the southern Dolakha show relatively high inflows. The largest increase in inflow is in the municipality of Bhimeshwor (largest orange circle on map).
- VDCs east from Bhimeshwor show inflow increases of around one thousand individuals above normal. Kabhre, Mirge, Mali and Chyama are among the high inflow areas.
- Jiri, Hawa, Melung and Lakuridanda show a slight decrease in their flows (small blue circles on map).

## Dolakha Population Estimates 19th August 2015



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## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned

### Dolakha

- Dolakha has high levels of people who remain away from their home VDC, with an average per district of 14%.
- VDCs of particular concern are: Junga (24%) and Bhimeswor Municipality (19%).
- Data is missing for 39 VCDs, particularly in the north of the region.

In many VDCs mobile phone coverage is limited or user numbers are too low to make reliable claims. Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly; providing a useful complement to the existing displacement picture. Data for some VDCs is too low to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.

## Gorkha Population Estimates 19th August 2015

Pre-earthquake population

**290,000**
Population outflow  
(above normal)
**+13,000**

(8,000 ~ 18,000)

Population inflow  
(above normal)
**+1,400**

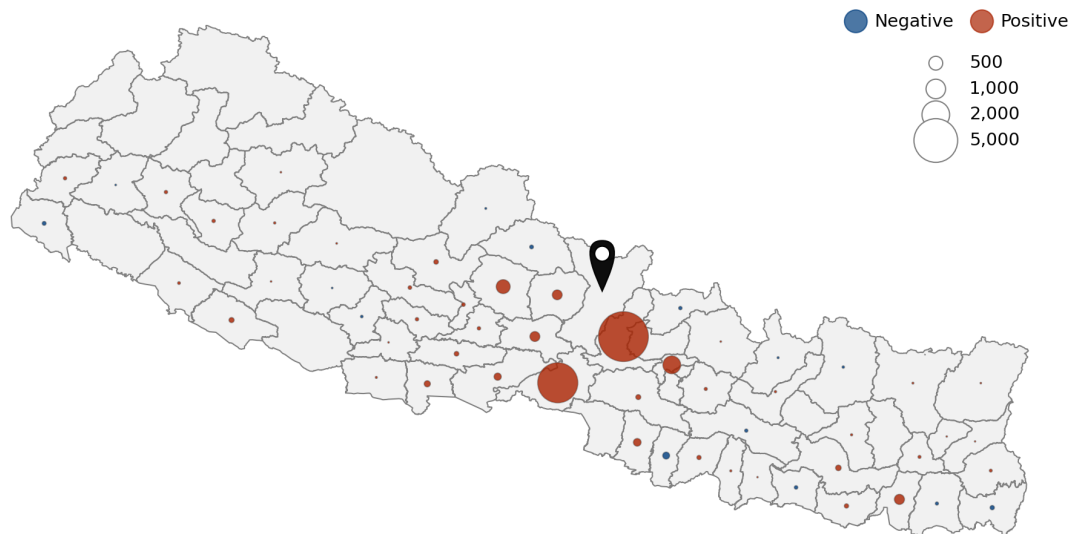
(800 ~ 2,000)

Gorkha district is home to 290,000 people under normal conditions [1].

### Key findings:

- An estimated 13,000 people more than expected had left Gorkha after the earthquake (ratio to the population 4.7%).
- An estimated 1,400 persons more than normal had come into Gorkha during the same period (ratio to the population 0.48%).
- Gorkha experienced large above normal flows to the nearby regions of Dhading and Chitwan, and small above normal flows to the regions immediately to the West.

### Above normal flows from Gorkha to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

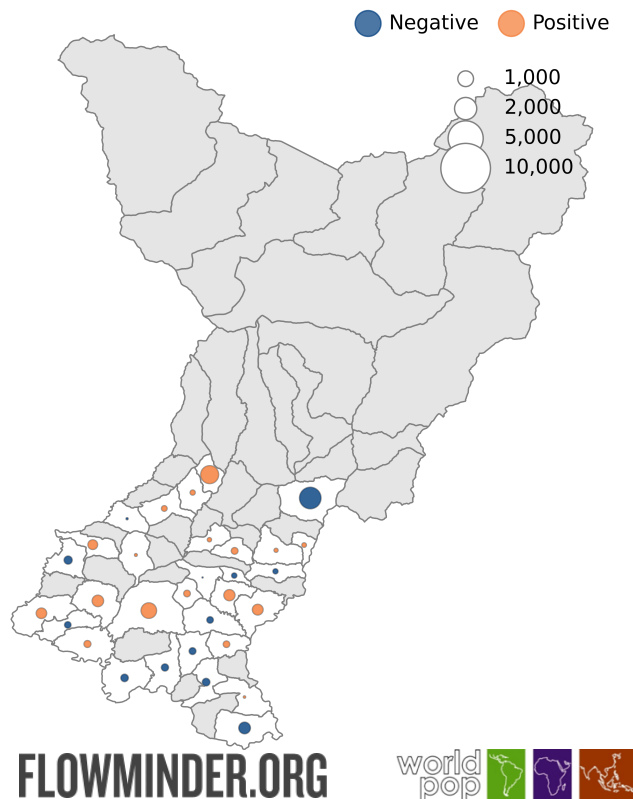
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Above normal flows from Gorkha to other districts, as of 19 August 2015

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## Gorkha Population Estimates 19th August 2015



## Flow Analysis

Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.

### Gorkha

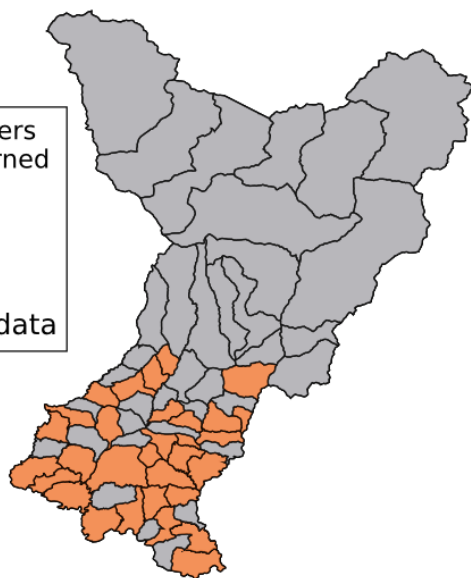
- The Prithbinarayan municipality shows an increase in inflows of around 2,000 individuals.
- Flows into Thumi have significantly decreased in the last week, with a deficit of more than 2,000 individuals. There seems to be a slight pattern of avoidance for some southern VDCs.
- Areas to the north of Gorkha main municipality exhibit increases in flow. This is especially noticeable in Simjung which shows a large flow above normal of around 2,000 individuals.

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## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned

### Gorkha

- Gorkha has few VDCs of great concern. Overall percentage of people away from their home VDC is less varied than in other districts with an average per district of 14%.
- The VDCs with highest proportion of people who have not returned are: Taple, Ghairung, Bungkot and Tanglichok, which all have around 17% people still away.
- Data is missing for 36 VDCs, mostly in the mountainous north.

In many VDCs mobile phone coverage is limited or user numbers are too low to make reliable claims. Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly; providing a useful complement to the existing displacement picture. Data for some VDCs is too low to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.



## Kavrepalanchok Population Estimates 19th August 2015

Pre-earthquake population

**400,000**

Population outflow  
(above normal)

**+14,000**

(8,000 ~ 20,000)

Population inflow  
(above normal)

**+13,000**

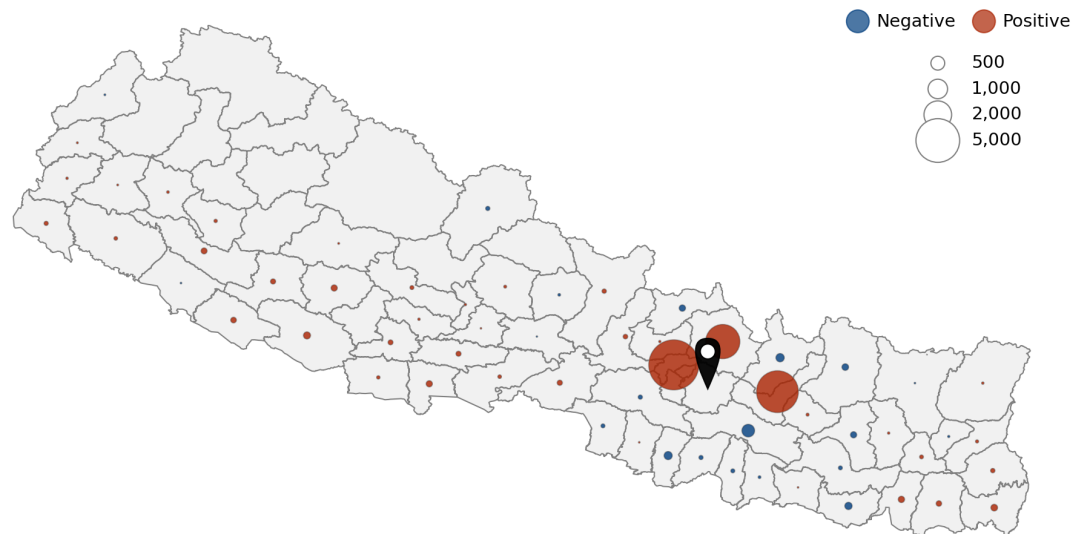
(8,000 ~ 18,000)

Kavrepalanchok district is home to 400,000 people under normal conditions [1].

### Key findings:

- An estimated 14,000 people more than expected had left Kavrepalanchok after the earthquake (ratio to the population 3.5%).
- An estimated 13,000 persons more than normal had come into Kavrepalanchok during the same period (ratio to the population 3.1%).
- Flows from Kavrepalanchok were concentrated to the surrounding districts of Ramechhap, Sindhupalchok and Kathmandu.

### Above normal flows from Kavrepalanchok to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

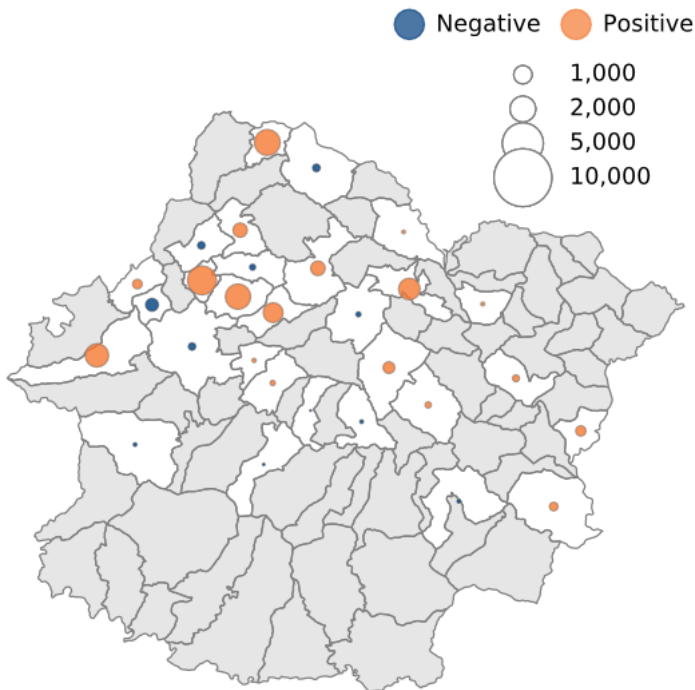
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Above normal flows from Kavrepalanchok to other districts,  
as of 19 August 2015

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## Kavrepalanchok Population Estimates 19th August 2015



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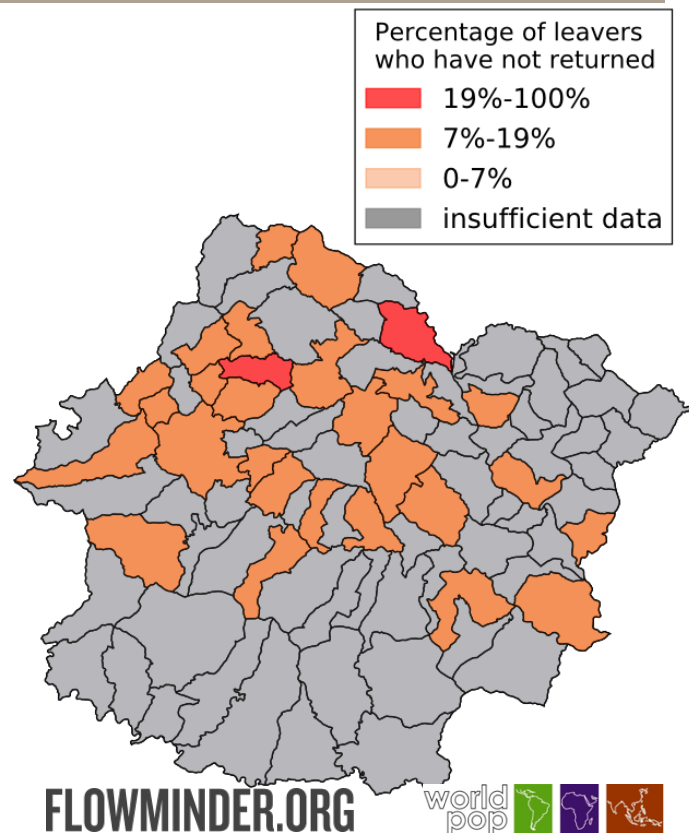
## Flow Analysis

Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.

### Kavrepalanchok

- The north west regions show greatest inflows (close to the Kathmandu Valley)
- Areas with greatest inflows are Kushadevi, Banepa, Dhulikhel, Kavre Nitya Chandeswor, Gairi Bisouna Deupur and Sathighar Bhagawati (from west to east)
- Some areas exhibit minor outflows. The greatest of these is Mahendra Jyoti.

## Kavrepalanchok Population Estimates 19th August 2015



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## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned

### Kavrepalanchok

- Kavrepalanchok has many regions with mid-levels of people still away from home. The mean percentage away is 14% with STD of 4%.
- VDCs of particular concern are Rabiopi (25%) and Jyamdi Mandan (22%)
- 62 VDCs are excluded from the analysis due to insufficient data.

Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly. Data for some VDCs is too small to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.

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## Makwanpur Population Estimates 19th August 2015

Pre-earthquake population

**450,000**Population outflow  
(above normal)**+5,400**  
(3,200 ~ 7,600)Population inflow  
(above normal)**+6,000**  
(3,600 ~ 8,400)

### 7. Makwanpur district

Makwanpur district is home to 450,000 people under normal conditions [1].

#### Key findings:

- An estimated 5,400 people more than expected had left Makwanpur after the earthquake (ratio to the population 1.2%).
- An estimated 6,000 persons more than normal had come into Makwanpur during the same period (ratio to the population 1.3%).
- Above normal flows were mostly directed towards all nearby districts, in particular to the Kathmandu valley.

### Above normal flows from Makwanpur to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

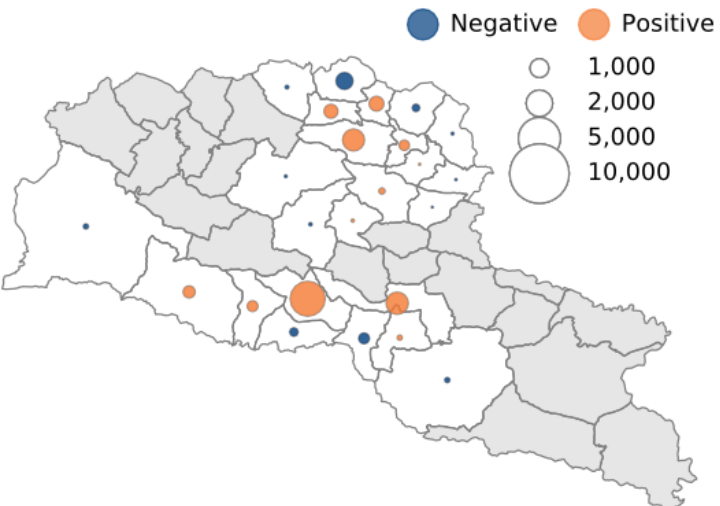
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Above normal flows from Makwanpur to other districts, as of  
19 August 2015

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## Makwanpur Population Estimates 19th August 2015



## Flow Analysis

Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.

## Makwanpur

- There are large inflows into the city of Hetauda and the adjacent Makwanpurgadhi region.
- Several of the VDCs close to the Kathmandu Valley show inflows above normal, while others in the same area show inflows below normal.

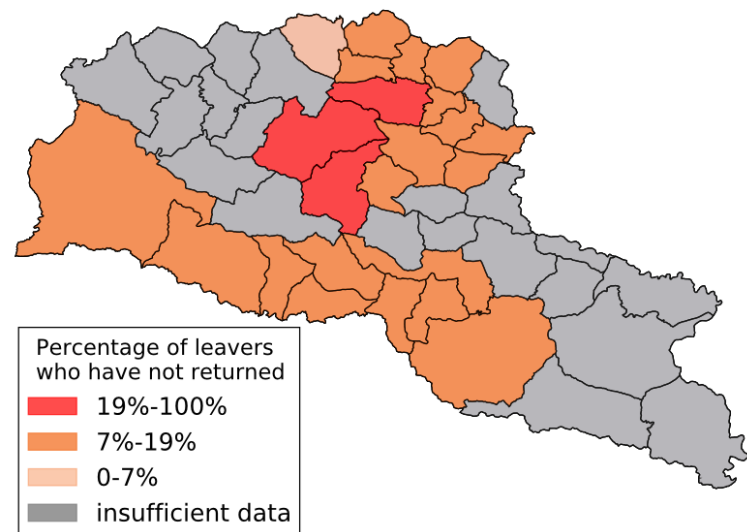
## Makwanpur Population Estimates 19th August 2015

## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned

### Makwanpur

- Makwanpur has many regions with mid-levels of people still away from home. The mean percentage away is 14%.
- VDCs of particular concern are Daman (27%), Namtar (22%) and Bhainse (21%)
- 21 VDCs are excluded from the analysis due to insufficient data.



Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly. Data for some VDCs is too small to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.

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## Nuwakot Population Estimates 19th August 2015

Pre-earthquake population

300,000

Population outflow  
(above normal)

+7,400

(4,000 ~ 10,000)

Population inflow  
(above normal)

+9,000

(5,000 ~ 13,000)

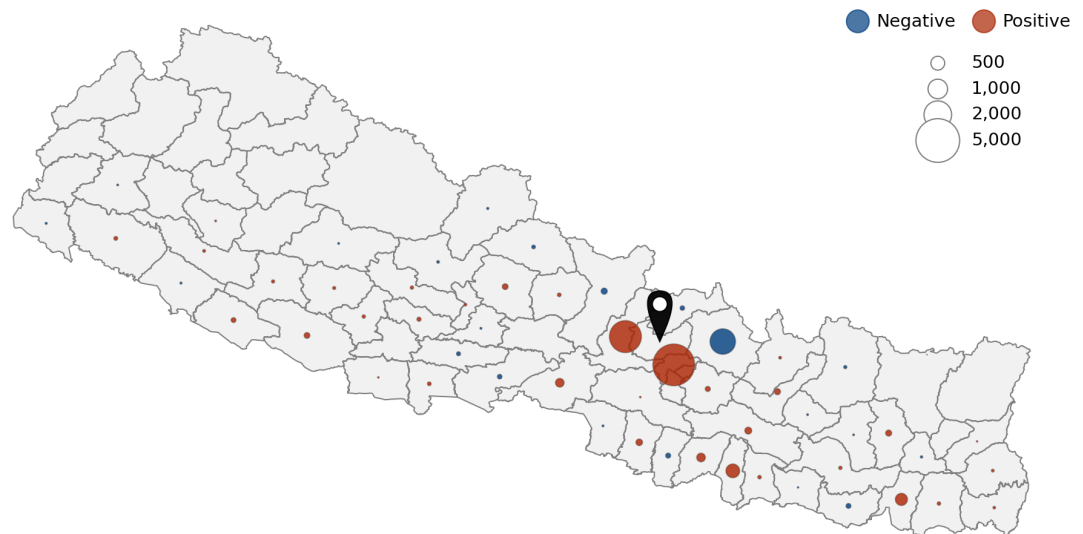
### 8. Nuwakot district

Nuwakot district is home to 300,000 people under normal conditions [1].

#### Key findings:

- An estimated 7,400 people more than expected had left after the earthquake (ratio to the population 2.5%).
- An estimated 9,000 persons more than normal had come into Nuwakot during the same period (ratio to the population 3%).
- There were below normal outflows to the neighbouring region of Sindhupalchok, whereas flows to Dhading and Kathmandu were increased.

### Above normal flows from Nuwakot to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

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Above normal flows from Nuwakot to other districts, as of 19 August 2015

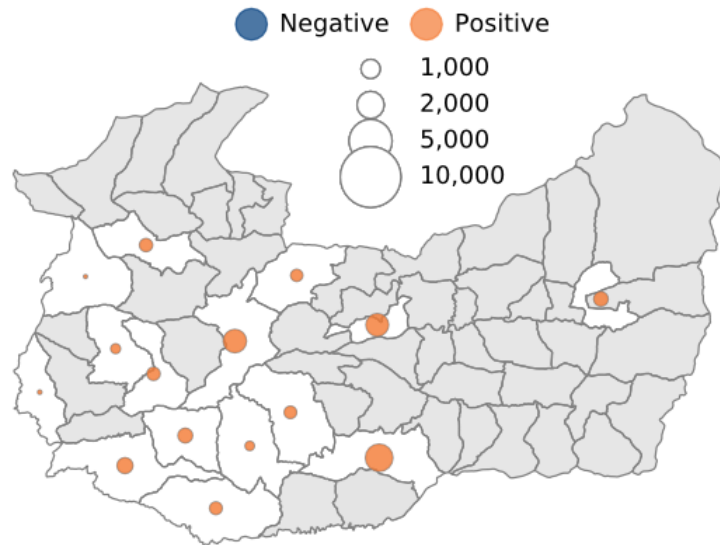
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## Nuwakot Population Estimates 19th August 2015

## Flow Analysis

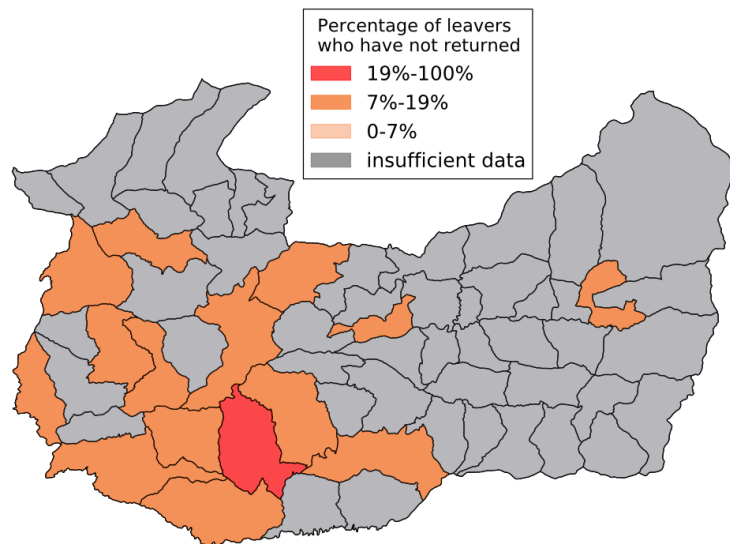
Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.



## Nuwakot

- There are inflows above normal into every VDC that we have data for in this region.
- The greatest of these are in Kakani, Bidur and Ganeshtan.

## Nuwakot Population Estimates 19th August 2015



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## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned

### Nuwakot

- Nuwakot has many regions with mid-levels of people still away from home. The mean percentage away is 13%.
- A VDCs of particular concern is Belkot (21%)
- 47 VDCs are excluded from the analysis due to insufficient data.

Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly. Data for some VDCs is too small to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.

## Okhaldhunga Population Estimates 19th August 2015

Pre-earthquake population

**160,000**Population outflow  
(above normal)**-1,000**  
(-600 ~ -1,400)Population inflow  
(above normal)**+2,600**  
(1,600 ~ 3,600)

Okhaldhunga district is home to 160,000 people under normal conditions [1].

### Key findings:

- An estimated 1,000 people less than expected had left Okhaldhunga after the earthquake (ratio to the population 0.65%).
- An estimated 2,600 persons more than normal had come into Okhaldhunga during the same period (ratio to the population 1.6%).
- Flows from Okhaldhunga were largely within their normal levels, with a slight decrease in flows to neighbouring Khotang, and an increase to Solukhumbu.

### Above normal flows from Okhaldhunga to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

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Above normal flows from Okhaldhunga to other districts, as of 19 August 2015

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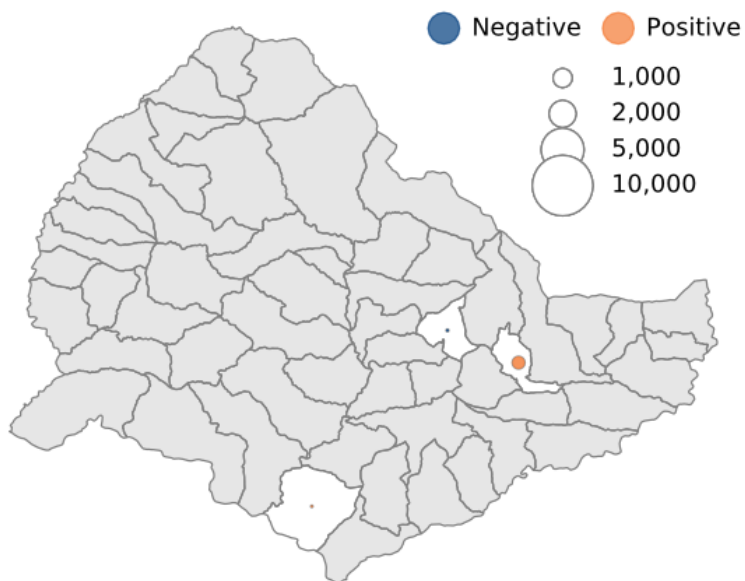
## Okhaldhunga Population Estimates 19th August 2015

## Flow Analysis

Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.

## Okhaldhunga

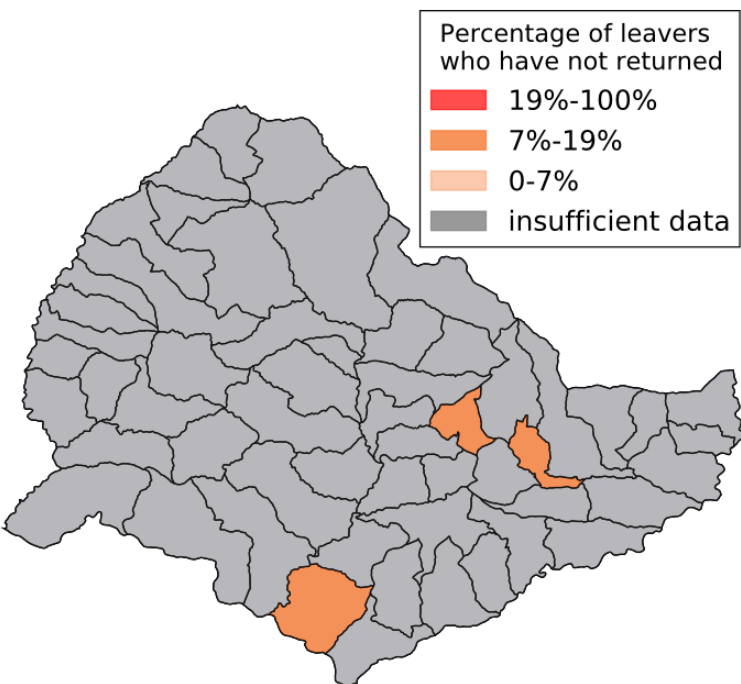
- Due to low coverage and low population density we have little data for this region.
- Where data is available it indicates low changes in flows after the earthquake.



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## Okhaldhunga Population Estimates 19th August 2015



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## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned

### Okhaldhunga

- There are only data for 3 admin 4 regions in Okhaldhunga. The mean percentage away is 16%.
- Region Okhaldhunga has the most away at 18%.
- 53 regions have no data.

Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly. Data for some VDCs is too small to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.

## Ramechhap Population Estimates 19th August 2015

Pre-earthquake population

**220,000**Population outflow  
(above normal)**+2,300**  
(1,400 ~ 3,200)Population inflow  
(above normal)**+27,000**  
(16,000 ~ 38,000)

Ramechhap district is home to 220,000 people under normal conditions [1].

### Key findings:

- An estimated 2,300 people more than expected had left after the earthquake (ratio to the population 1.1%).
- An estimated 27,000 persons more than normal had come into Ramechhap during the same period (ratio to the population 12%).
- Ramechhap saw all flows close to their normal levels for all regions; however, the flows to regions Sinhuli and the Kathmandu valley were slightly elevated.

### Above normal flows from Ramechhap to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

#### Contacts:

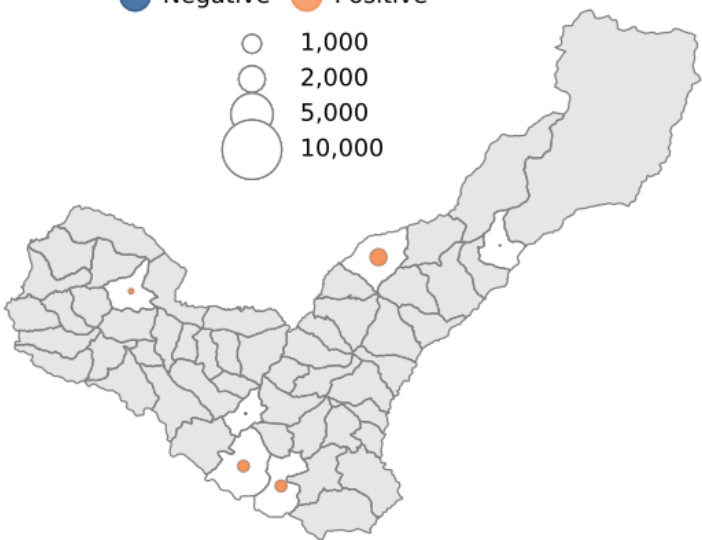
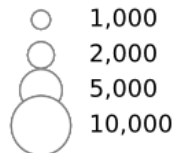
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Above normal flows from Ramechhap to other districts, as of  
19 August 2015

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## Ramechhap Population Estimates 19th August 2015

● Negative ● Positive



## Flow Analysis

Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.

## Ramechhap

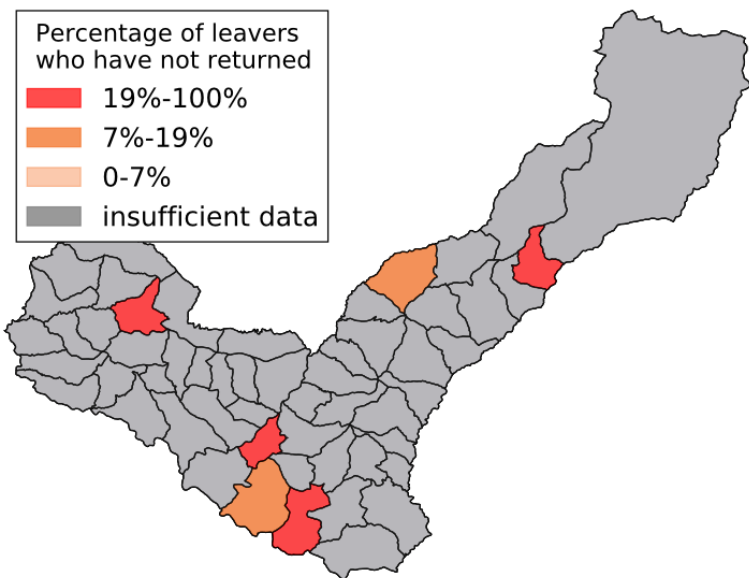
- There are large areas of Ramechhap where little data is available.
- Where data is available however it indicates substantial flows above normal, especially in Rasanatu VDC.



## Ramechhap Population Estimates 19th August 2015

## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned



## Ramechhap

- Ramechhap: has data for 6 admin 4 regions. Several of these show high levels of people still away from their home locations. The mean percentage away is 22%.
- Regions of particular concern are Manthali (40%), Sukajor (28%) and Bamti (22%).
- 49 regions have no data.

Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly. Data for some VDCs is too small to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.

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## Rasuwa Population Estimates 19th August 2015

Pre-earthquake population

46,000

Population outflow  
(above normal)+2,800  
(1,700 ~ 3,900)Population inflow  
(above normal)-100  
(-60 ~ -140)

Rasuwa district is home to 46,000 people under normal conditions [1].

### Key findings:

- An estimated 2,800 people more than expected had left after the earthquake (ratio to the population 6.2%).
- An estimated 100 persons less than normal had come into Rasuwa during the same period (ratio to the population 0.22%).
- Flows from Rasuwa to all districts were very close to normal levels, with the exception of slightly elevated flows to the two nearby regions of Nuwakot and the Kathmandu valley.

### Above normal flows from Rasuwa to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

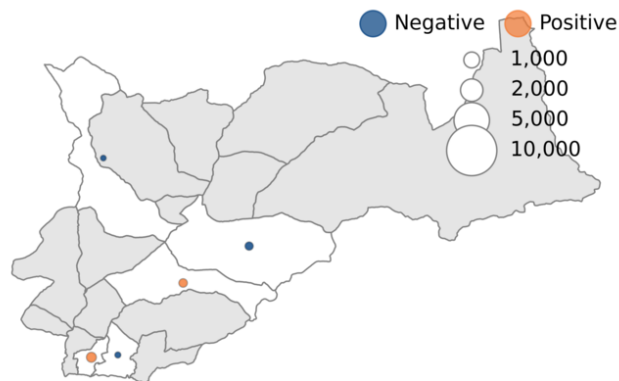
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Above normal flows from Rasuwa to other districts, as of 19 August 2015

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## Rasuwa Population Estimates 19th August 2015



## Flow Analysis

Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.

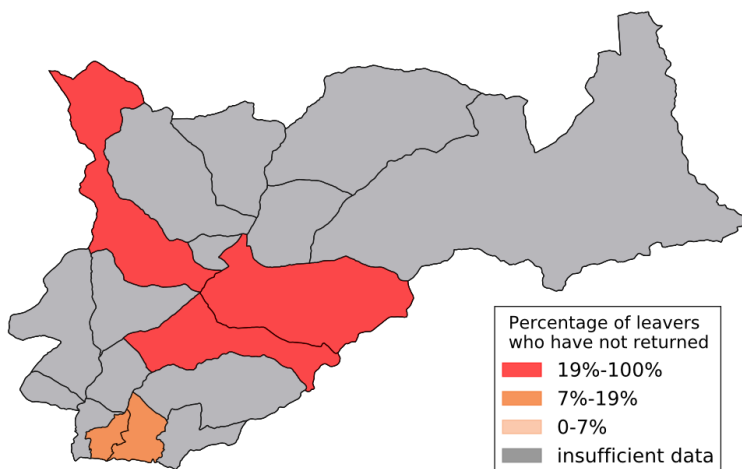
## Rasuwa

- Rasuwa has only a small number of VDCs with reliable data. Flows in absolute numbers reflect only small deviations from normal, but relative to the size of its population these flows can be considered significant.
- Avoidance of Syafru, Gatlang and Ghorle is denoted by a lower than normal inflow into these areas.
- Dhunche and Dhaibung had an increase of hundreds of individuals in the last week.

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## Rasuwa Population Estimates 19th August 2015



## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned

### Rasuwa

- The data suggests that Rasuwa has high percentages of people still away, with an overall average per VDC of 30%.
- Regions of particular concern are: Gatlang (54%), Syaphru (40%) and Dhunche (31%)
- Data is missing for 13 VDCs.

In many VDCs mobile phone coverage is limited or user numbers are too low to make reliable claims. Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly; providing a useful complement to the existing displacement picture. Data for some VDCs is too low to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.

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## Sindhuli Population Estimates 19th August 2015

Pre-earthquake population

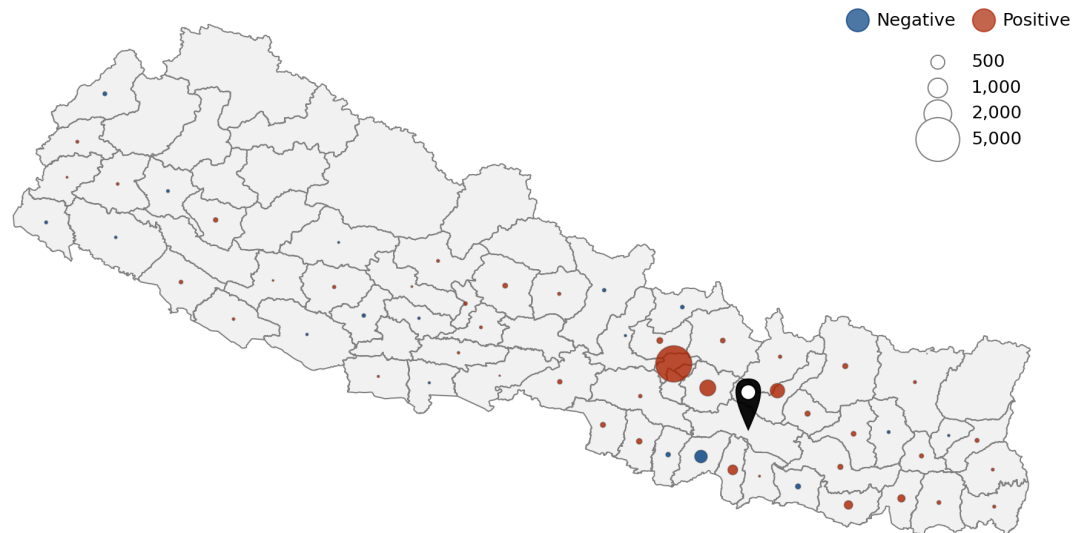
**320,000**
Population outflow  
(above normal)
**+5,600**  
(3,400 ~ 7,800)
Population inflow  
(above normal)
**+2,200**  
(1,300 ~ 3,100)

Sindhuli district is home to 320,000 people under normal conditions [1].

### Key findings:

- An estimated 5,600 people more than expected had left Sindhuli after the earthquake (ratio to the population 1.8%).
- An estimated 2,200 persons more than normal had come into Sindhuli during the same period (ratio to the population 0.71%).
- Most flows from Sindhuli were close to normal levels with the exception of an elevated flow to the Kathmandu Valley and to a lesser extent to the neighbouring districts of Kavrepalanchok and Ramechhap.

### Above normal flows from Sindhuli to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

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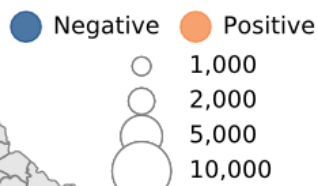
## Sindhuli Population Estimates 19th August 2015

## Flow Analysis

Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.

### Sindhuli

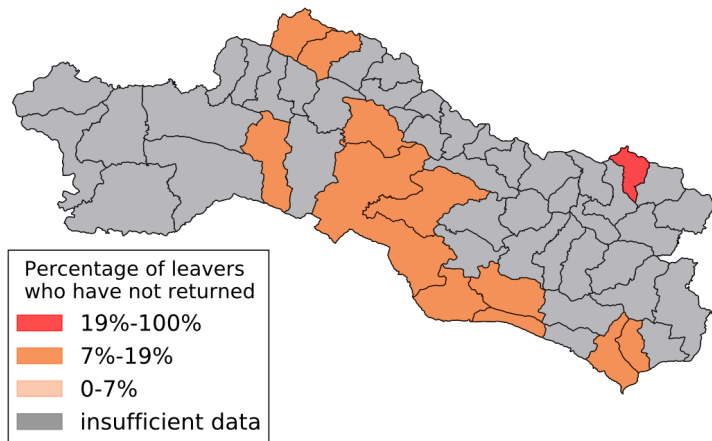
- Large inflows above normal were recorded for Sindhulimadi.
- Inflows above normal were also recorded for regions to the north: Jhangajholi Ralmata, Purano Jhangajholi and Bhadrakali.
- Inflows below normal were recorded for Nipane, Bhimeshwor and Dudhouli.



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## Sindhuli Population Estimates 19th August 2015



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## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned

### Sindhuli

- Sindhuli has data for 12 admin 4 regions. The mean percentage away is 13%.
- Region Khangsang is of particular concern with the most away at 20%.
- 42 regions have no data.

Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly. Data for some VDCs is too small to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.



## Sindhupalchok Population Estimates 19th August 2015

Pre-earthquake population

**310,000**
Population outflow  
(above normal)
**+25,000**

(15,000 ~ 35,000)

Population inflow  
(above normal)
**+3,600**

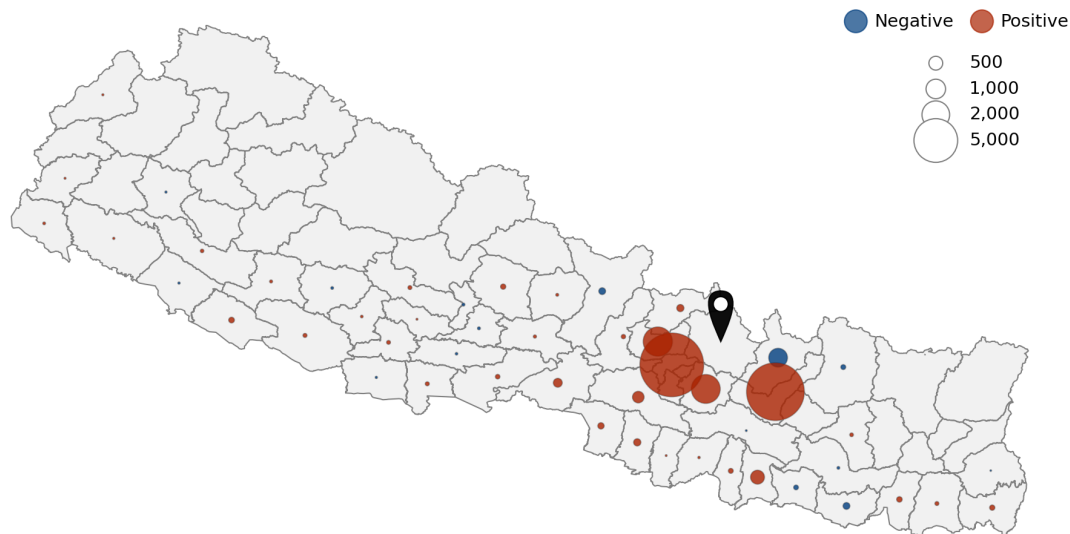
(2,200 ~ 5,000)

Sindhupalchok district is home to 310,000 people under normal conditions [1].

### Key findings:

- An estimated 25,000 people more than expected had left Sindhupalchok after the earthquake (ratio to the population 8%).
- An estimated 3,600 persons more than normal had come into Sindhupalchok during the same period (ratio to the population 1.2%).
- Sindhupalchok saw very large above normal flows to the neighbouring districts of the Kathmandu valley, Ramechhap, Kavrepalanchok and Nuwakot. Flows to Dolkha were slightly below normal.

### Above normal flows from Sindhupalchok to other districts



[1] [www.worldpop.org](http://www.worldpop.org)

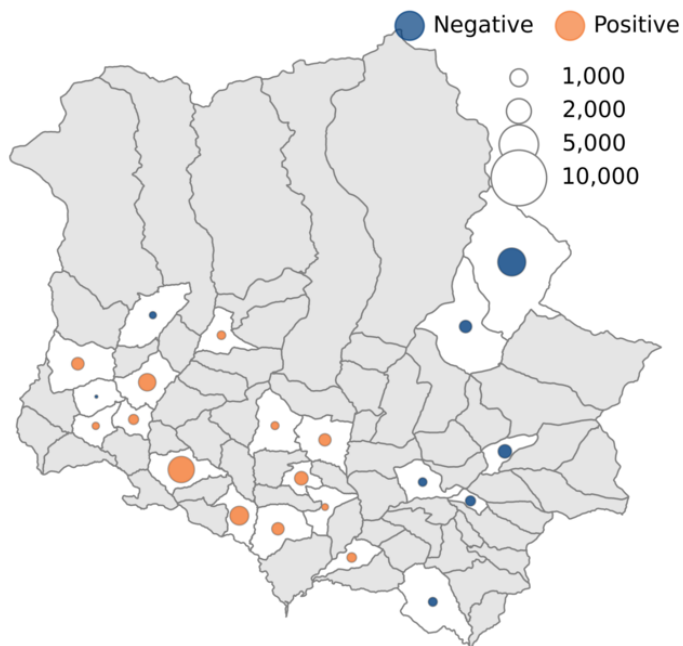
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Above normal flows from Sindhupalchok to other districts, as of 19 August 2015

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## Sindhupalchok Population Estimates 19th August 2015



## Flow Analysis

Above normal inflows into VDCs (since the earthquake) by people with pre- earthquake homes in other VDCs.

### Sindhupalchok

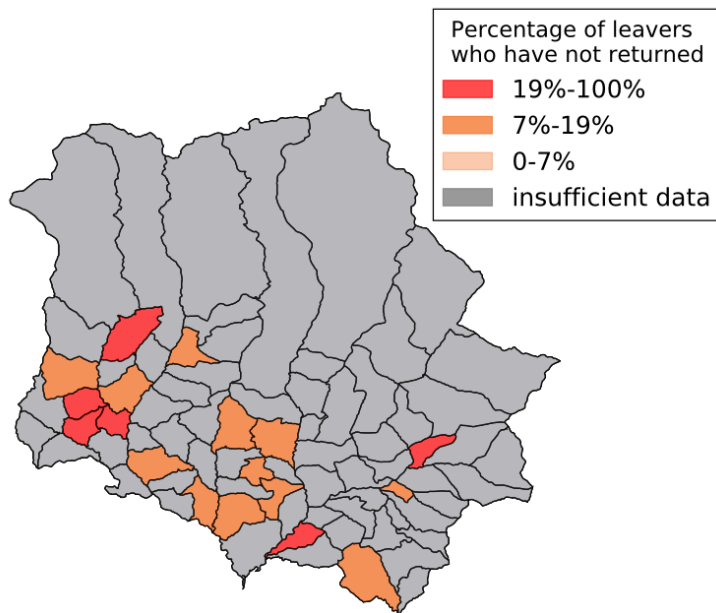
- Large inflows are present in the South and South-West regions with magnitudes of thousands for Badegau, Bhotsipa and Dubachaur.
- The council of Tatopani in the North-east shows a significant decrease in inflows. A general avoidance of eastern VDCs is denoted by their flows below normal.

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Flowminder.org is a non-profit organization registered in Stockholm, Sweden. Ncell is a mobile operator in Nepal and part of the Teliasonera group. Analyses are based on de-identified mobile network data and conducted in accordance with mobile industry (GSMA) *Guidelines on the protection of privacy in the use of mobile phone data for responding to the Ebola outbreak*, published October 2014.

## Sindhupalchok Population Estimates 19th August 2015



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## Return Analysis

Percentage of population who left their home VDC after the earthquake and have not returned

### Sindhupalchok

- Sindhupalchok is a region with a relatively large number of concern VDCs, and a high overall percentage at 19%.
- Regions of concern are: Kiul (39%), Barhabise (35%), Talamarar (27%), Kalika (23%) and Melamchi (22%).
- Data exists for 18 regions, concentrated mainly in the south.

In many VDCs mobile phone coverage is limited or user numbers are too low to make reliable claims. Colour indicates the percentage of the originally displaced people who remain away from their home district as of 3rd August. Areas are categorised as having low, moderate or high numbers of people remaining away from home and coloured accordingly; providing a useful complement to the existing displacement picture. Data for some VDCs is too low to be statistically significant and is excluded from the analysis, this is partially due to ongoing replacement of radio towers.