# Does Urbanization Drive Changes in Poverty in Afghanistan (2006–2022)?

## Abstract

This project examines the relationship between urbanization and poverty in Afghanistan from 2006 to 2022. Using World Bank World Development Indicators, urbanization is proxied by the share of the urban population living in slums, while poverty is measured by the national poverty headcount ratio. Both indicators increased over the period, with the slum population showing a slight downturn in recent years and poverty headcount rising sharply and consistently. These descriptive trends suggest that urbanization pressures may be associated with poverty dynamics, though the results remain correlational. The findings highlight the need for additional indicators and regional data to better understand the complex interplay between urban growth and poverty reduction.

## 1. Question

Does urbanization drive changes in poverty in Afghanistan between 2006 and 2022?

- **Proxy for urbanization**: Slum population (% of urban population)
- **Measure of poverty**: Poverty headcount ratio (% of population)

## 2. Data

- **Source**: World Bank World Development Indicators (WDI)
- **Indicators**:
  - Population living in slums (% of urban population)
  - Poverty headcount ratio at national poverty lines (% of population)
- **Coverage**: Afghanistan, 2006–2022 (years with available data only)
- **Notes**: Only national-level data; some years missing for each indicator.

## 3. Method

1. Filtered dataset for Afghanistan.
2. **Selected relevant columns**: Year, Indicator Name, Value.
3. Pivoted indicators into separate columns and sorted by year.
4. Produced a line graph comparing slum population and poverty headcount over time.

(Analysis is descriptive; no causal methods were applied.)

# 4. Results

- **Urbanization** (slum population): Increased steadily until recent years, when a slight downturn is observed.
- **Poverty headcount**: Rose consistently, increasing more sharply than slum population.
- **Comparison**: Both indicators increased overall. The slowdown in slum growth contrasts with continued poverty increases, suggesting urban improvements did not reduce poverty.

(Figure 1. Poverty and Slum Population in Afghanistan, 2006–2022)

(Table 1. Pivoted dataset)

# 5. Interpretation

- Rising slum population reflects ongoing urbanization pressures.
- Poverty growth outpaced urbanization improvements, indicating that urban expansion alone may not alleviate poverty.
- Descriptive trends highlight the complexity of development dynamics in Afghanistan and the limits of national-level indicators.

# 6. Limitations

- Only two indicators analyzed.
- Gaps exist for some years.
- National-level data only; no regional detail.
- No causal relationships established.

# 7. Next Steps / Extensions

- Incorporate additional urbanization and poverty indicators.
- Use subnational/regional data to study heterogeneity.
- Apply econometric models to test causal pathways.
- Compare Afghanistan with similar fragile states for broader insight.

```python
In [2]:  # ============================
         # POVERTY INDICATORS COMPARISON: AFGHANISTAN
         # ============================

         import pandas as pd
         import matplotlib.pyplot as plt
         import os
```

```python
# Folders
data_raw_folder = "data_raw/"
data_clean_folder = "data_clean/"
figures_folder = "figures/"

# Load CSV
filename = "afghanistan_poverty.csv"
df = pd.read_csv(os.path.join(data_raw_folder, filename))

# Keep only Afghanistan + needed columns
df = df[df["Country Name"] == "Afghanistan"]
df = df[["Year", "Indicator Name", "Value"]]

# Convert Year and Value to numeric, drop invalid Value rows
df["Year"] = pd.to_numeric(df["Year"], errors="coerce")
df["Value"] = pd.to_numeric(df["Value"], errors="coerce")
df = df.dropna(subset=["Value"])

# Aggregate duplicates
df = df.groupby(["Year", "Indicator Name"], as_index=False).mean()

# Pivot indicators into separate columns
df_pivot = df.pivot(index="Year", columns="Indicator Name", values="Value").
df_pivot = df_pivot.sort_values("Year")

print("Pivoted dataset:")
display(df_pivot)

# Interpolate for plotting
df_plot = df_pivot.interpolate(method='linear')

# Identify the actual data ranges for each indicator
slum_years = df_pivot.dropna(subset=["Population living in slums (% of urban
poverty_years = df_pivot.dropna(subset=["Poverty headcount ratio at national

# Plot two lines
plt.figure(figsize=(10,6))

# Slum population line (full range)
plt.plot(df_plot["Year"],
         df_plot["Population living in slums (% of urban population)"],
         marker='o', label="Slum Population (% of urban population)")

# Poverty headcount line (limited to actual data range)
poverty_mask = (df_plot["Year"] >= poverty_years.min()) & (df_plot["Year"] <
plt.plot(df_plot["Year"][poverty_mask],
         df_plot["Poverty headcount ratio at national poverty lines (% of po
         marker='o', label="Poverty Headcount (% of population)")

plt.title("Afghanistan: Slum Population vs Poverty Headcount")
plt.xlabel("Year")
plt.ylabel("Percentage of Population")
plt.xticks([2006,2008,2010,2012,2014,2016,2018,2020,2022])
plt.legend()
plt.grid(True)
```

```
plt.tight_layout()
plt.savefig(os.path.join(figures_folder, "afghanistan_slums_vs_poverty_lines
plt.show()

# Save cleaned CSV (original data, no interpolation)
df_pivot.to_csv(os.path.join(data_clean_folder, "afghanistan_slums_vs_povert
```

Pivoted dataset:

| Indicator Name | Year | Multidimensional poverty headcount ratio (% of total population) | Multidimensional poverty headcount ratio, children (% of population ages 0-17) | Multidimensional poverty index (scale 0-1) | Multidimensional poverty index, children (population ages 0-17) (scale 0-1) |
|---|---|---|---|---|---|
| 0 | 2006 | NaN | NaN | NaN | NaN |
| 1 | 2007 | NaN | NaN | NaN | NaN |
| 2 | 2008 | NaN | NaN | NaN | NaN |
| 3 | 2010 | NaN | NaN | NaN | NaN |
| 4 | 2011 | NaN | NaN | NaN | NaN |
| 5 | 2012 | NaN | NaN | NaN | NaN |
| 6 | 2014 | NaN | NaN | NaN | NaN |
| 7 | 2016 | 51.7 | 56.4 | 0.270 | 0.30 |
| 8 | 2018 | NaN | NaN | NaN | NaN |
| 9 | 2020 | 49.4 | 53.8 | 0.265 | 0.29 |
| 10 | 2022 | NaN | NaN | NaN | NaN |



Afghanistan: Slum Population vs Poverty Headcount