An Assessment of

Impact of Institutional Capacity,

Educational Outcomes and Political Leadership in the Economic Growth of Municipalities of Nepal

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# Baseline Visuals

A map of the country

Description automatically generated

*Figure 2: Average nightlight per sq.km for Nepal at municipality level from 2014 to 2017*

# Variables and Date Sources

1. **rel\_chgnl**: log (sum of night light of 2021) – log (sum of nightlight of 2017)

*Extracted from* [*VIIRS Nighttime Lights dataset*](https://eogdata.mines.edu/products/vnl/) *using QGIS software*

1. **log\_baseline\_nl:** log (average of sum of night light of 2014, 2015, 2016, 2017)

*Extracted from* [*VIIRS Nighttime Lights dataset*](https://eogdata.mines.edu/products/vnl/) *using QGIS software*

1. **lisa\_avg**: average LISA score of 2020/21 and 2021/22 (In case, LISA score of 2020/21 was not available, LISA score of 20 21/22 is considered to be the average)

*Downloaded from* [*LISA website*](https://lisa.mofaga.gov.np/home) *of the government of Nepal*

1. **rel\_lisa\_avg**: calculated as follows:
   1. ben\_mark\_lisa = lisa\_avg of benchmark municipality (Municipality named “Mohanyal” with a LISA score of 66.25)
   2. generate rel\_lisa = lisa\_avg - ben\_mark\_lisa
2. **high\_school\_percentage:** percentage of population who have completed high school (to be changed to percentage of population who have completed high school or above)

*Manually constructed dataset from datasets of each province from* [*National Population and Housing Census 2021*](https://censusnepal.cbs.gov.np/results/literacy)

1. **ageatelection**: age of chairperson at election in 2017  
   *Manually constructed dataset from* [*the election result pdfs*](https://oldsite.election.gov.np/election/en/election-result-book.html) *published in Nepali*

1. **gov\_coalition**: dummy variable Government Coalition = 1 if the chairperson of the municipality is affiliated with the parties in the federal government coalition

*Manually constructed dataset from* [*the election result pdfs*](https://oldsite.election.gov.np/election/en/election-result-book.html) *published in Nepali and then coded in Stata*

1. **female**: dummy variable female = 1if the chairperson is a female  
   *Manually constructed dataset from* [*the election result pdfs*](https://oldsite.election.gov.np/election/en/election-result-book.html) *published in Nepali and then coded in Stata*
2. **ln\_popn**: log of population as per census of 2021

*Extracted from the* [*Preliminary Data of National Population and Housing Census 2021*](https://opendatanepal.com/dataset/preliminary-data-of-national-population-and-housing-census-2021)

1. **LISA sub-categories averages of 2020/21 and 2021/22**

|  |  |  |  |
| --- | --- | --- | --- |
| **SN** | **Category Title** | **Points** | **Coded variable** |
| 1 | Governance Management | 9 | gov\_magm\_avg |
| 2 | Organization & Administration | 8 | org\_admin\_avg |
| 3 | Budget Plan Management | 11 | budg\_magm\_avg |
| 4 | Fiscal Economic Management | 11 | fiscal\_magm\_avg |
| 5 | Service Delivery | 16 | service\_dev\_avg |
| 6 | Judicial Execution | 9 | jud\_exe\_avg |
| 7 | Physical Infrastructure | 13 | phy\_infra\_avg |
| 8 | Social Inclusion | 10 | soc\_inc\_avg |
| 9 | Environmental Protection and Disaster Management | 10 | env\_protec\_avg |
| 10 | Cooperation and Coordination | 6 | cop\_cor\_avg |
|  | **Total** | **100** |  |

# Scatter of LISA scores

# A graph with blue dots and red line Description automatically generated

*Figure 3: Scatter plot with fitted line of relative change in nightlight in natural logarithm from 2017 to 2021 over average LISA score of 2020/21 and 2021/22*

*A graph with blue dots and red line

Description automatically generated*

*Figure 4: Scatter plot with fitted line of relative change in nightlight in natural logarithm from 2017 to 2021 over benchmarked LISA score of “Mohanyal” municipality*

# CASE I (Relative LISA)

* **rel\_lisa = lisa\_avg - ben\_mark\_lisa**

## Initial Regression

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| VARIABLES | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl |
|  |  |  |  |  |  |  |  |  |
| log\_baseline\_nl | 0.014 | 0.011 | 0.003 | 0.003 | 0.003 | 0.002 | 0.002 | -0.013 |
|  | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.008) |
| rel\_lisa |  | 0.001\* | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
|  |  | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| high\_school\_percent |  |  | 0.011\*\*\* | 0.011\*\*\* | 0.011\*\*\* | 0.012\*\*\* | 0.012\*\*\* | 0.009\*\*\* |
|  |  |  | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| ageatelection |  |  |  |  | 0.000 | 0.000 | 0.000 | -0.000 |
|  |  |  |  |  | (0.001) | (0.001) | (0.001) | (0.001) |
| gov\_coalitiion |  |  |  |  |  | -0.020 | -0.020 | -0.019 |
|  |  |  |  |  |  | (0.012) | (0.012) | (0.012) |
| female |  |  |  |  |  |  | 0.055 | 0.061 |
|  |  |  |  |  |  |  | (0.049) | (0.051) |
| ln\_popn |  |  |  |  |  |  |  | 0.057\*\*\* |
|  |  |  |  |  |  |  |  | (0.008) |
| Constant | 0.265\*\*\* | 0.289\*\*\* | 0.206\*\*\* | 0.206\*\*\* | 0.194\*\*\* | 0.215\*\*\* | 0.213\*\*\* | -0.248\*\*\* |
|  | (0.049) | (0.048) | (0.046) | (0.046) | (0.058) | (0.062) | (0.062) | (0.077) |
|  |  |  |  |  |  |  |  |  |
| Observations | 692 | 692 | 692 | 692 | 692 | 692 | 692 | 692 |
| R-squared | 0.003 | 0.012 | 0.124 | 0.124 | 0.124 | 0.128 | 0.130 | 0.191 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# CASE II (Original Regression)

* **lisa\_avg = average LISA score of 2020/21 and 2021/22**

## Initial Regression

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| VARIABLES | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl |
|  |  |  |  |  |  |  |  |  |
| log\_baseline\_nl | 0.014 | 0.011 | 0.003 | 0.003 | 0.003 | 0.002 | 0.002 | -0.013 |
|  | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.008) |
| lisa\_avg |  | 0.001\* | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
|  |  | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| high\_school\_percent |  |  | 0.011\*\*\* | 0.011\*\*\* | 0.011\*\*\* | 0.012\*\*\* | 0.012\*\*\* | 0.009\*\*\* |
|  |  |  | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| ageatelection |  |  |  |  | 0.000 | 0.000 | 0.000 | -0.000 |
|  |  |  |  |  | (0.001) | (0.001) | (0.001) | (0.001) |
| gov\_coalitiion |  |  |  |  |  | -0.020 | -0.020 | -0.019 |
|  |  |  |  |  |  | (0.012) | (0.012) | (0.012) |
| female |  |  |  |  |  |  | 0.055 | 0.061 |
|  |  |  |  |  |  |  | (0.049) | (0.051) |
| ln\_popn |  |  |  |  |  |  |  | 0.057\*\*\* |
|  |  |  |  |  |  |  |  | (0.008) |
| Constant | 0.265\*\*\* | 0.211\*\*\* | 0.219\*\*\* | 0.219\*\*\* | 0.208\*\*\* | 0.225\*\*\* | 0.223\*\*\* | -0.235\*\*\* |
|  | (0.049) | (0.062) | (0.058) | (0.058) | (0.067) | (0.071) | (0.071) | (0.075) |
|  |  |  |  |  |  |  |  |  |
| Observations | 692 | 692 | 692 | 692 | 692 | 692 | 692 | 692 |
| R-squared | 0.003 | 0.012 | 0.124 | 0.124 | 0.124 | 0.128 | 0.130 | 0.191 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## LISA Regression

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| VARIABLES | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| log\_baseline\_nl | 0.014 | 0.014 | 0.014 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.008 | 0.006 | 0.006 | 0.002 |
|  | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) |
| gov\_magm\_avg |  | 0.004 | 0.006 | 0.002 | 0.004 | -0.002 | -0.001 | -0.003 | -0.004 | -0.004 | -0.006 | -0.009 |
|  |  | (0.007) | (0.008) | (0.009) | (0.008) | (0.009) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) |
| org\_admin\_avg |  |  | -0.003 | -0.006 | -0.004 | -0.009 | -0.009 | -0.011 | -0.011 | -0.012\* | -0.012\* | -0.005 |
|  |  |  | (0.006) | (0.006) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) |
| budg\_magm\_avg |  |  |  | 0.008 | 0.010\* | 0.007 | 0.007 | 0.004 | 0.003 | 0.003 | 0.003 | 0.003 |
|  |  |  |  | (0.005) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.005) | (0.005) |
| fiscal\_magm\_avg |  |  |  |  | -0.005 | -0.008 | -0.008 | -0.010 | -0.010 | -0.010\* | -0.011\* | -0.009 |
|  |  |  |  |  | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) |
| service\_dev\_avg |  |  |  |  |  | 0.010\*\*\* | 0.010\*\* | 0.007\* | 0.007 | 0.007 | 0.006 | 0.005 |
|  |  |  |  |  |  | (0.004) | (0.004) | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) |
| jud\_exe\_avg |  |  |  |  |  |  | -0.000 | -0.003 | -0.003 | -0.004 | -0.005 | -0.011\* |
|  |  |  |  |  |  |  | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) |
| phy\_infra\_avg |  |  |  |  |  |  |  | 0.012\*\*\* | 0.012\*\*\* | 0.011\*\*\* | 0.008\*\* | 0.006\* |
|  |  |  |  |  |  |  |  | (0.003) | (0.003) | (0.004) | (0.004) | (0.003) |
| soc\_inc\_avg |  |  |  |  |  |  |  |  | 0.002 | 0.000 | -0.001 | -0.002 |
|  |  |  |  |  |  |  |  |  | (0.004) | (0.004) | (0.004) | (0.004) |
| env\_protec\_avg |  |  |  |  |  |  |  |  |  | 0.006 | 0.002 | -0.005 |
|  |  |  |  |  |  |  |  |  |  | (0.005) | (0.005) | (0.005) |
| cop\_cor\_avg |  |  |  |  |  |  |  |  |  |  | 0.018\*\*\* | 0.015\*\*\* |
|  |  |  |  |  |  |  |  |  |  |  | (0.005) | (0.005) |
| high\_school\_percent |  |  |  |  |  |  |  |  |  |  |  | 0.011\*\*\* |
|  |  |  |  |  |  |  |  |  |  |  |  | (0.001) |
| Constant | 0.265\*\*\* | 0.237\*\*\* | 0.235\*\*\* | 0.235\*\*\* | 0.240\*\*\* | 0.240\*\*\* | 0.240\*\*\* | 0.299\*\*\* | 0.303\*\*\* | 0.314\*\*\* | 0.356\*\*\* | 0.332\*\*\* |
|  | (0.049) | (0.079) | (0.078) | (0.078) | (0.080) | (0.079) | (0.079) | (0.080) | (0.080) | (0.081) | (0.082) | (0.079) |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Observations | 692 | 692 | 692 | 692 | 692 | 692 | 692 | 692 | 692 | 692 | 692 | 692 |
| R-squared | 0.003 | 0.004 | 0.004 | 0.008 | 0.009 | 0.017 | 0.017 | 0.034 | 0.034 | 0.035 | 0.054 | 0.154 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Revised Regression

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| VARIABLES | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl | rel\_chgnl |
|  |  |  |  |  |  |  |  |  |  |
| log\_baseline\_nl | 0.014 | 0.008 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | -0.001 | -0.015\* |
|  | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.008) |
| phy\_infra\_avg |  | 0.009\*\*\* | 0.004 | -0.000 | -0.000 | 0.000 | 0.000 | 0.001 | -0.002 |
|  |  | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| cop\_cor\_avg |  |  | 0.014\*\*\* | 0.009\*\* | 0.009\*\* | 0.009\*\* | 0.009\*\* | 0.008\*\* | 0.009\*\* |
|  |  |  | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| high\_school\_percent |  |  |  | 0.011\*\*\* | 0.011\*\*\* | 0.011\*\*\* | 0.011\*\*\* | 0.011\*\*\* | 0.008\*\*\* |
|  |  |  |  | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| ageatelection |  |  |  |  | 0.000 | 0.000 | 0.000 | -0.000 | -0.000 |
|  |  |  |  |  | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| female |  |  |  |  |  | 0.054 | 0.054 | 0.054 | 0.059 |
|  |  |  |  |  |  | (0.048) | (0.048) | (0.050) | (0.052) |
| gov\_coalitiion |  |  |  |  |  |  |  | -0.022\* | -0.020\* |
|  |  |  |  |  |  |  |  | (0.012) | (0.012) |
| ln\_popn |  |  |  |  |  |  |  |  | 0.057\*\*\* |
|  |  |  |  |  |  |  |  |  | (0.008) |
| Constant | 0.265\*\*\* | 0.240\*\*\* | 0.246\*\*\* | 0.210\*\*\* | 0.206\*\*\* | 0.205\*\*\* | 0.205\*\*\* | 0.225\*\*\* | -0.233\*\*\* |
|  | (0.049) | (0.050) | (0.051) | (0.048) | (0.060) | (0.060) | (0.060) | (0.064) | (0.075) |
|  |  |  |  |  |  |  |  |  |  |
| Observations | 692 | 692 | 692 | 692 | 692 | 692 | 692 | 692 | 692 |
| R-squared | 0.003 | 0.021 | 0.034 | 0.130 | 0.130 | 0.133 | 0.133 | 0.137 | 0.197 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1