

# An Assessment of Impact of Institutional Capacity, Educational Outcomes and Political Leadership in the Economic Growth of Municipalities of Nepal

*Primary Researcher: **Aashish Panta '26***

*Research Mentor: **Raj Kharel***

## Abstract

Rural and urban municipalities of Nepal have witnessed an upward trajectory in economic growth in the past few years manifested as infrastructural progress such as road expansions, power connectivity, educational and health facilities, and more. A robust understanding of the factors conducive to economic growth in municipalities can provide a policy roadmap for further strengthening such factors.

In my research, I am interested in empirically analyzing the impact of three key potential determinants of economic growth---institutional capacity, educational outcomes, and political leadership---from 2017 to 2021.

In an institutional capacity, I refer to the ability of municipalities to execute their responsibilities reflected through their day-to-day performance and overall accomplishments. I am curious whether stronger institutional capacity is related to better economic growth or not.

In terms of educational outcomes, I am focusing on the percentage of the population with a high school degree or above. There is a plethora of literature that affirms that higher educational attainment among the population yields higher economic growth. I am eager to see if the conclusion holds true in the context of the municipalities of Nepal.

In the case of political leadership, I am specifically looking at quantifiable aspects of chairpersons of municipality---like their sex, age at election, and political affiliation. These three variables provide a foundation for analyzing the difference in the performance of male and female leaders, the impact of age on economic growth, and the performance of chairpersons belonging to the ruling party in the federal government.

## Introduction of Federalism in Nepal

- Nepal became a federal republic in 2015 after promulgation of a new constitution in 2015
- The tiers of governments under federalism are:
  - 1 federal government
  - 7 provincial governments
  - 753 local governments
    - 6 metropolitan cities
    - 11 sub-metropolitcal cities
    - 276 municipalities
    - 460 rural municipalities
- Government tenures:
  - 1<sup>st</sup> election: September 2017
  - 2<sup>nd</sup> election: May 2022

## Quantifying Economic Growth

- Lack of data on GDP of local governments
- Nightlight data of Nepal used as a proxy for economic activities
- Nightlight data is an idea proxy for economic activities for a developing country like Nepal as a large share of economy is in informal sector, which is not effectively captured by GDP
- Researchers have used VIIRS night light data to analyze:
  - Post earthquake recovery in Nepal
  - Post covid recovery in Nepal
- Researchers have shown a strong correlation between log of total sum of night light data of Nepal and log of real GDP
  - I am currently working on extracting datasets to verify the correlation from 2017 to 2021.

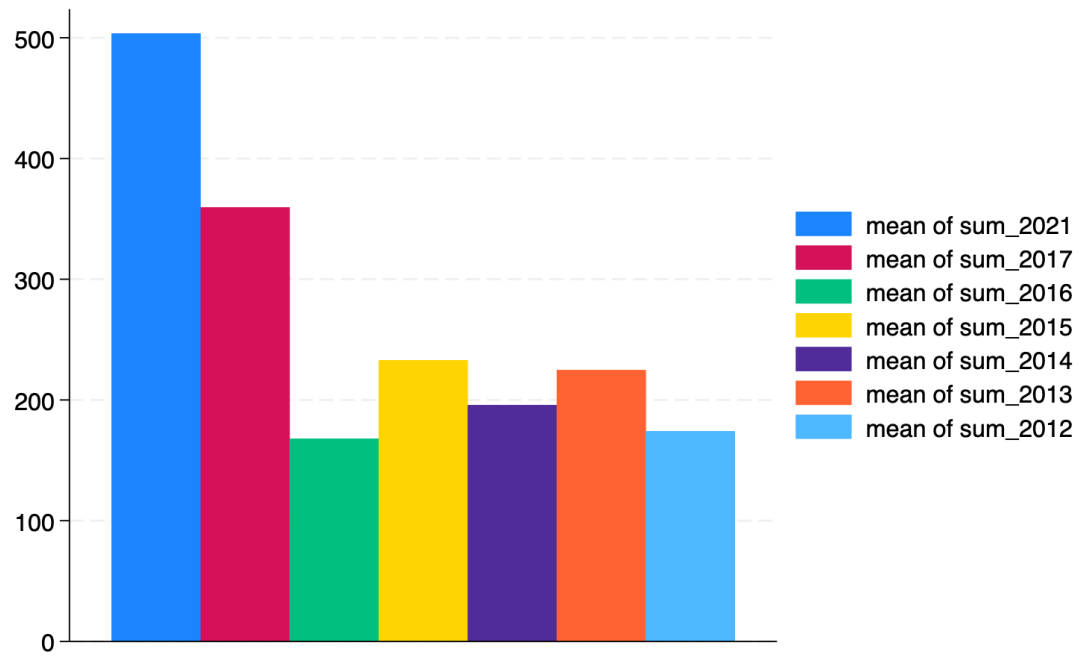


Figure 1: Bar graph of mean of sum of nightlight in across different years

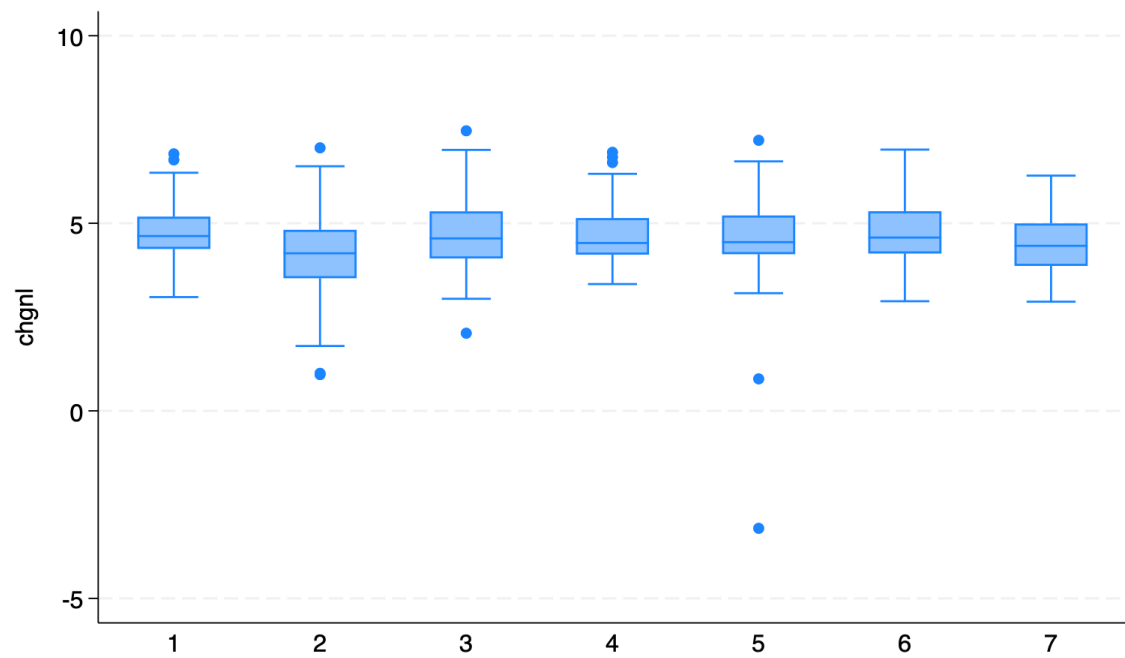


Figure 2: Box plot of log ( $\Delta$ night light from 2017 to 2021) across 7 provinces

## Institutional Capacity

- Local Government Institutional Capacity Self-Assessment (LISA)
  - An assessment metric introduced by Ministry of Federal Affairs and General Administration in 2020/21
  - Focused on day-to-day performance and overall quantitative accomplishments
  - A total of 100 points divided as follows:
    - Overall Status: 21 points
    - Day to Day Operational Process Status: 34%
    - Result-Oriented Status: 45%
- An aspect which can be substantially improved without significant investment of capital and labor

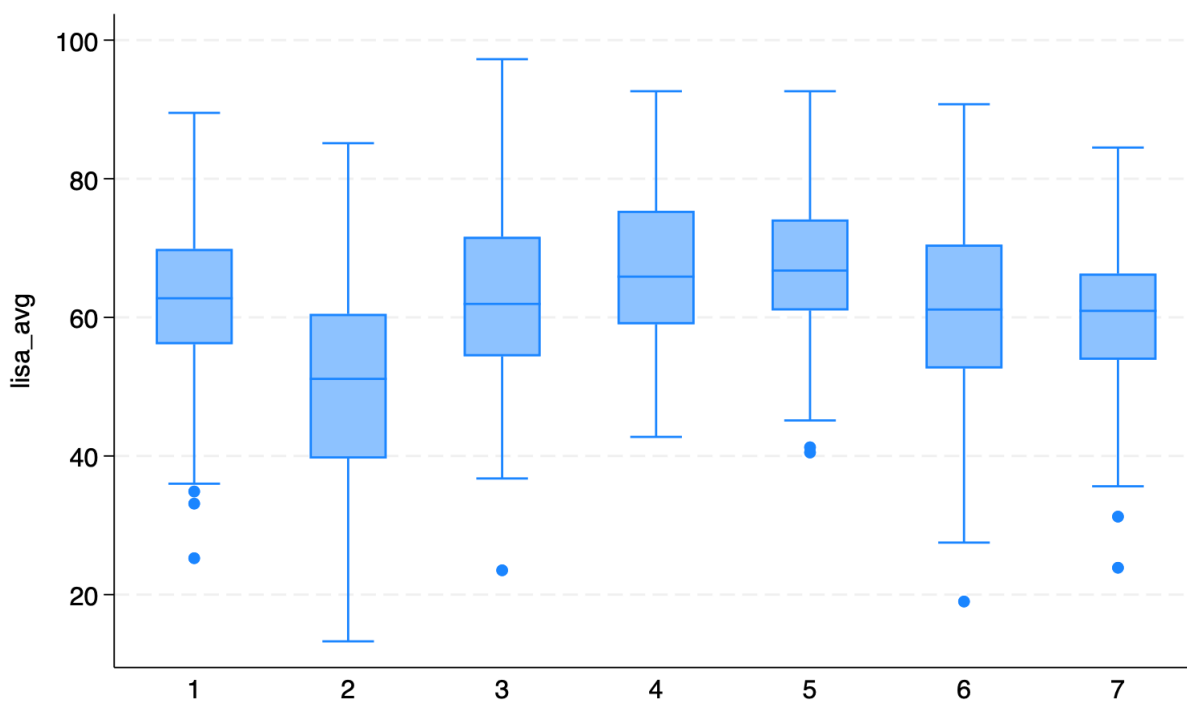


Figure 3: Box plot of average LISA score of 2020/21 and 2021/22 across 7 provinces

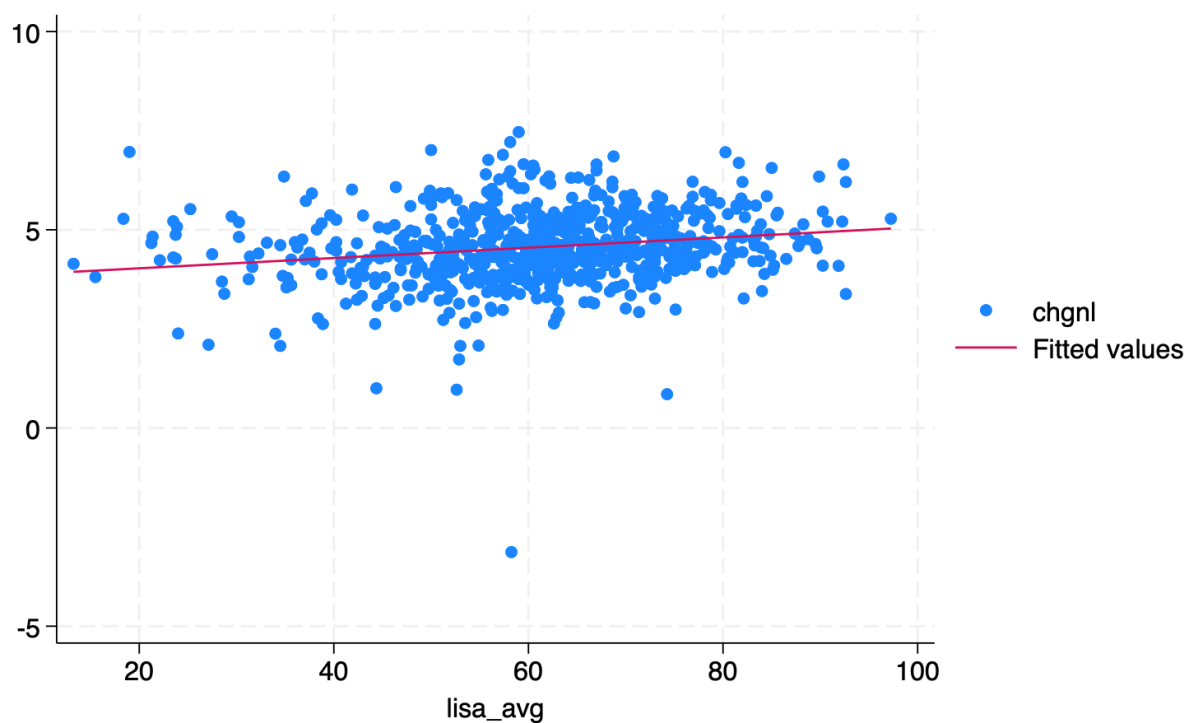


Figure 4: Scatter plot with fitted line of  $\log(\Delta \text{night light from 2017 to 2021})$  over average LISA score of 2020/21 and 2021/22

## Educational Outcome

- Currently have the data on population that has high school qualification
  - Will be replacing with population that has high school qualification and above
- It has an interesting impact in the regression

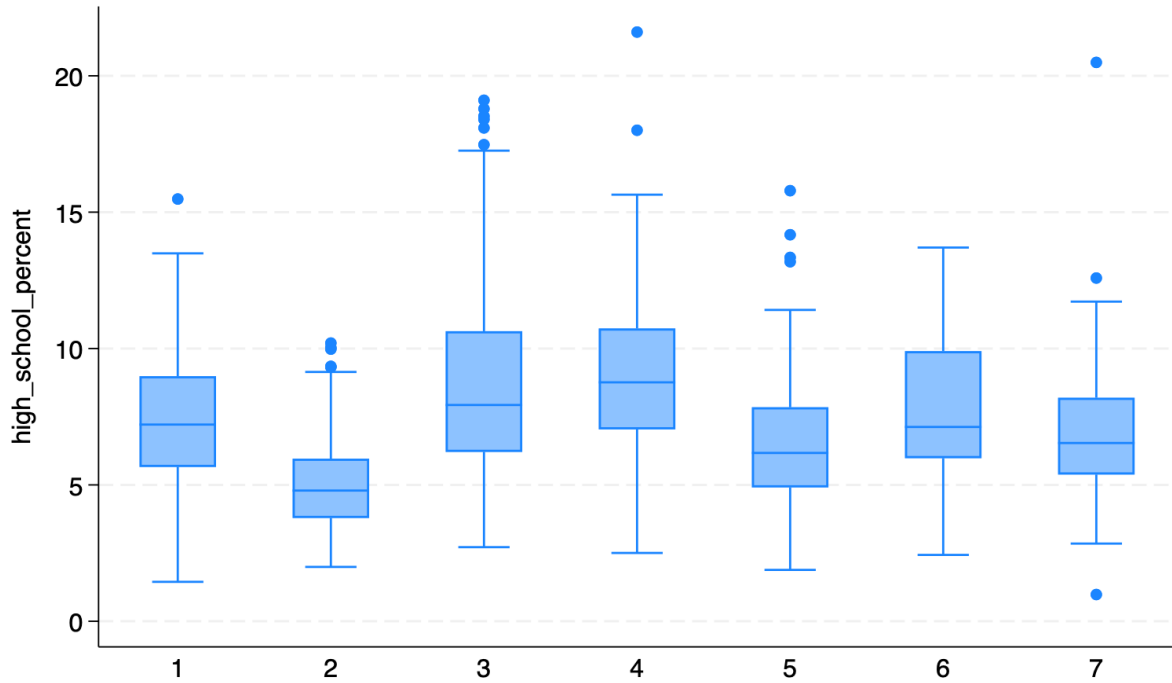


Figure 5: Box plot of high school attainment percent per 2021 census across 7 provinces

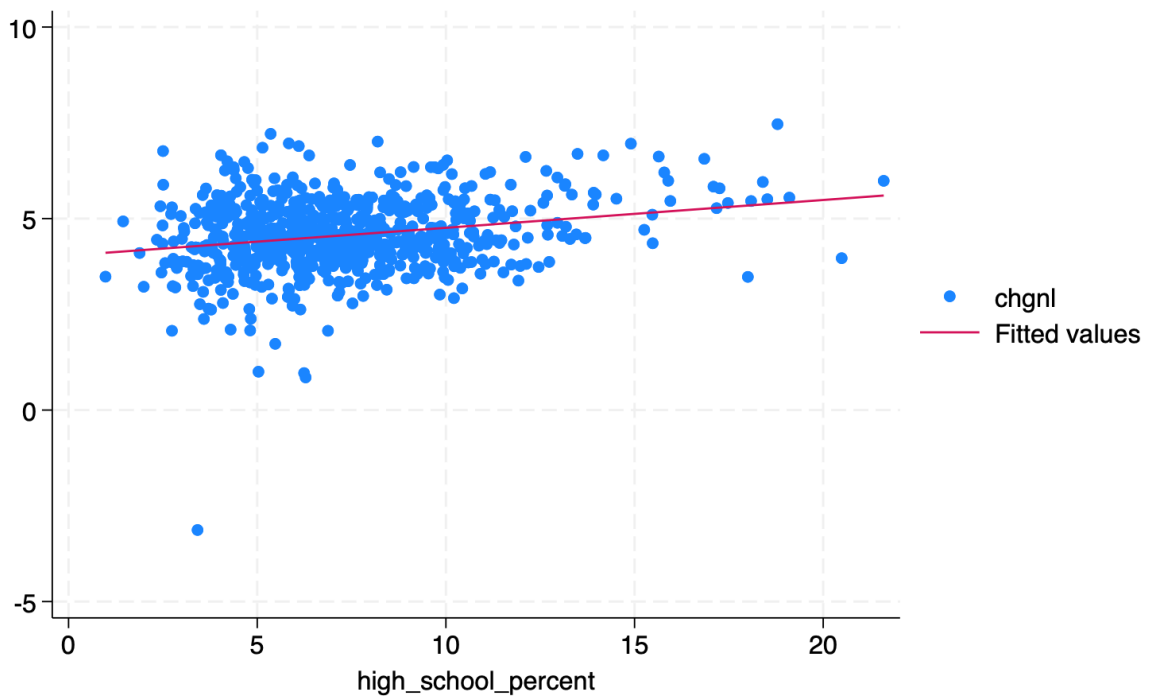


Figure 6: Scatter plot with fitted line of log ( $\Delta$ night light from 2017 to 2021) high school attainment percent per 2021 census

## Political Leadership

- Focused on chairperson only
- Only 14 female observations across 735 observations

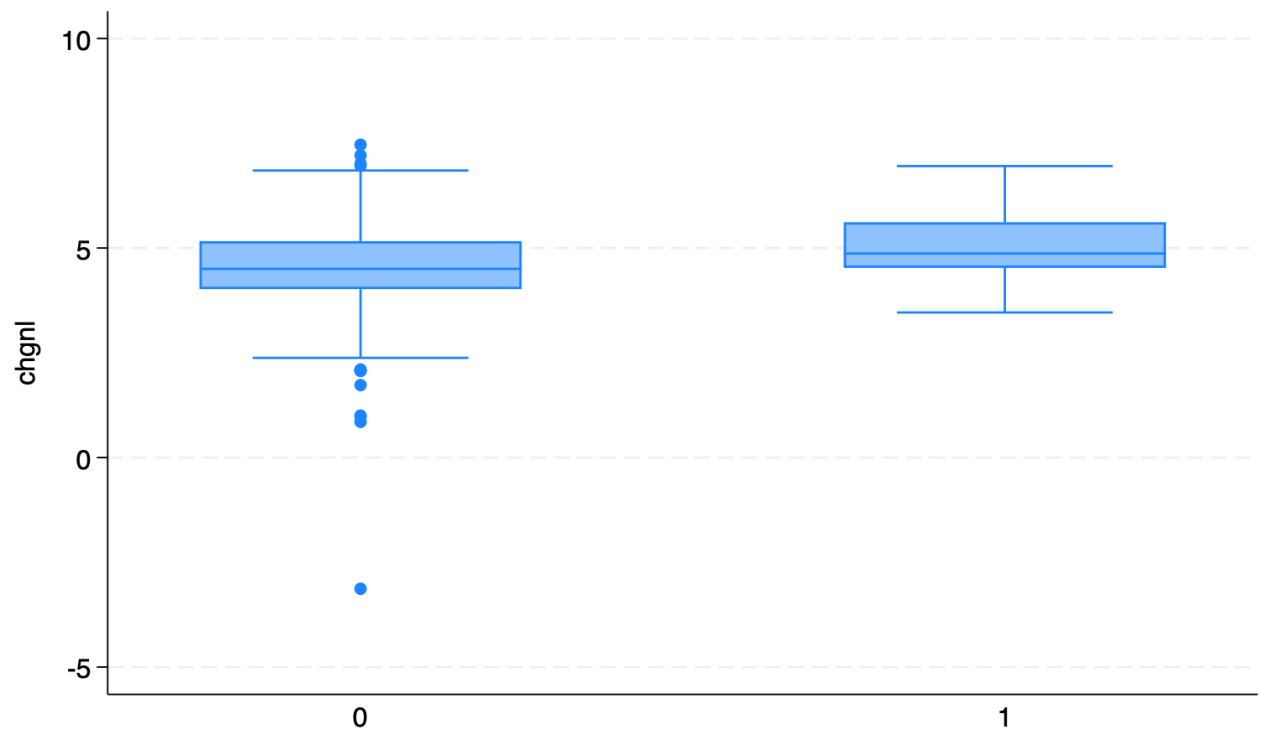


Figure 7: Box plot of  $\log(\Delta \text{night light from 2017 to 2021})$  across male and female. 0 indicates males whereas 1 indicates female.

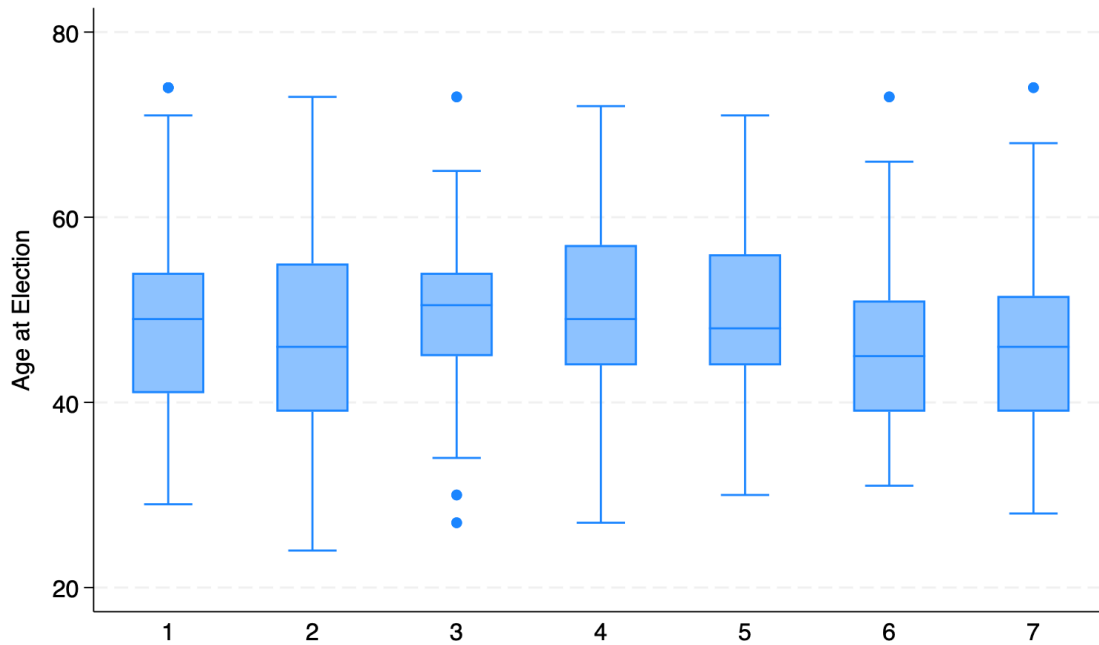


Figure 8: Box plot of age at election in 2017 across 7 provinces

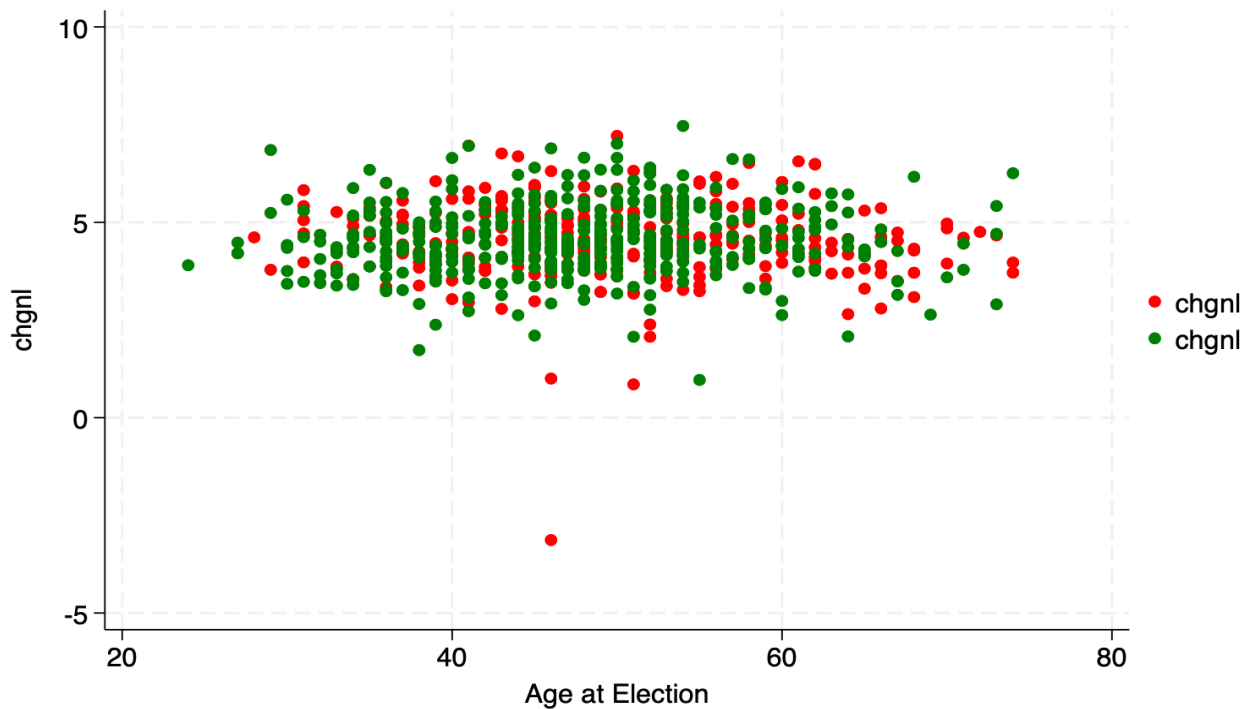


Figure 9: scatter plot of  $\log(\Delta \text{night light from 2017 to 2021})$  over age at election of municipality chairperson in 2017. Red dots indicate the affiliation to opposition whereas green dots indicate the affiliation to government coalition.



## Variables and Data Sources

1. **y**: log (sum of night light of 2021 – sum of nightlight of 2017)  
*Extracted from [VIIRS Nighttime Lights dataset](#) using QGIS software*
2. **x1**: average LISA score of 2020/21 and 2021/22 (In case, LISA score of 2020/21 was not available, LISA score of 2021/22 is considered to be the average)  
*Downloaded from [LISA website](#) of the government of Nepal*
3. **x2**: log baseline = log (average of sum of night light of 2014, 2015, 2016, 2017)  
*Extracted from [VIIRS Nighttime Lights dataset](#) using QGIS software*
4. **x3**: log of population as per census of 2021  
*Extracted from the [Preliminary Data of National Population and Housing Census 2021](#)*
5. **x4**: dummy variable Urban = 1 if a local government is municipality, sub-metropolitan city, metropolitan city  
*Coded in Stata*
6. **x5**: 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](#) published in Nepali and then coded in Stata*
7. **x6**: age of chairperson at election in 2017  
*Manually constructed dataset from [the election result pdfs](#) published in Nepali*
8. **x7**: dummy variable Female = 1 if the chairperson is a female  
*Manually constructed dataset from [the election result pdfs](#) published in Nepali and then coded in Stata*
9. **x8**: 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](#)*

## Regression Results

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$\ln(\Delta nl)$	$\ln(\Delta nl)$	$\ln(\Delta nl)$	$\ln(\Delta nl)$	$\ln(\Delta nl)$	$\ln(\Delta nl)$	$\ln(\Delta nl)$	$\ln(\Delta nl)$
Avg LISA Score	0.013*** (0.002)	0.006*** (0.002)	0.005*** (0.002)	0.005*** (0.002)	0.005*** (0.002)	0.005*** (0.002)	0.005*** (0.002)	0.002 (0.002)
Log Baseline		0.956*** (0.034)	0.941*** (0.035)	0.934*** (0.035)	0.934*** (0.035)	0.934*** (0.035)	0.932*** (0.035)	0.930*** (0.034)
Log Population 2021			0.083*** (0.030)	0.052 (0.037)	0.052 (0.037)	0.057 (0.037)	0.056 (0.037)	0.054 (0.036)
Urban				0.086 (0.062)	0.086 (0.062)	0.085 (0.062)	0.087 (0.062)	0.023 (0.062)
Government Coalition					-0.001 (0.048)	-0.006 (0.048)	-0.006 (0.048)	-0.039 (0.048)
Age at Election						-0.002 (0.003)	-0.002 (0.003)	-0.003 (0.002)
Female							0.267 (0.172)	0.210 (0.170)
High School %								0.044*** (0.008)
Constant	3.768*** (0.156)	-0.750*** (0.195)	-1.468*** (0.323)	-1.151*** (0.395)	-1.151*** (0.395)	-1.087*** (0.402)	-1.082*** (0.402)	-1.101*** (0.395)
Observations	735.000	735.000	735.000	735.000	735.000	735.000	735.000	735.000
R-squared	0.036	0.532	0.537	0.538	0.538	0.538	0.540	0.556

Standard error in parentheses

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

## Key Questions

- How can I determine which y variable is appropriate?
  - $\log(\text{sum of night light of 2021} - \text{sum of nightlight of 2017})$  is a measure of absolute change
  - $\log(\text{sum of night light of 2021}) - \log(\text{sum of nightlight of 2017})$ , which is  $\log(\text{sum of night light of 2021}) / \log(\text{sum of nightlight of 2017})$ , is a measure of proportional change
  - I do not think percentage is relevant
- How do I determine the scale of x variables?
  - Do I need to convert others in log as well?
- The results are significantly altered changed by adding high school education.
  - What could be a cause for this?
  - Checked for multi collinearity using VIF
- Way forwards:
  - I aspire to convert this research into a publishable paper
    - What should be my next step?