

2023

## A Comparative Study of Traditional Donors and Non-traditional Donors in Sri Lanka

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### Recommended Citation

Sritharan, Narayani, A Comparative Study of Traditional Donors and Non-traditional Donors in Sri Lanka (2023). *Orbis*, 67(4), 579-604.  
<https://doi.org/10.1016/j.orbis.2023.08.007>

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# Subnational aid allocation in a postwar setting – a comparative study of traditional donors and non-traditional donors.

Narayani Sritharan<sup>\$+</sup>

## Abstract

This paper examines subnational aid allocation patterns during the postwar period in Sri Lanka, focusing on whether war-affected areas receive aid. We use geocoding, mapping, and econometric analysis to understand whether war-affected districts received more aid than others after controlling for economic development. The paper uses geocoded aid projects comparing the aid allocation priorities of the People's Republic of China (PRC) as a bilateral donor and World Bank and Asian Development Bank as multilateral donors. The PRC and World Bank aid projects' geocoded data come from AidData, while we geocoded Asian Development Bank projects at the ADM2 level. The data covers 2002-2014, both years included. The study finds that, in general, donors do not respond to the needs of the poorer and war-affected districts, which affects reconciliation and, thereby, long-term sustainable peace. Additionally, we find that China aid project allocations are motivated by domestic politicians, whereas that may be different for multilateral aid projects.

**Keywords:** Subnational aid, China, War, Donors

*The author declares no conflict of interest.*

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## **INTRODUCTION**

War-torn regions often suffer from the destruction of infrastructure, displacement of populations, and economic devastation. In response, aid from international donors is often sent to these regions to help alleviate some of the suffering. However, there is an ongoing debate about whether aid is targeted to the districts affected by war. This journal article aims to answer whether war-affected areas receive aid by analyzing aid allocation patterns in Sri Lanka during the postwar period. By examining this case study, we can gain insights into aid allocation in postwar countries and the challenges of promoting economic, political, and ethnic reconciliation in these regions.

Previous studies on aid flows have mostly been cross-national, e.g., Gounder, 2005; Nkurunziza, 2015; Collier & Hoeffler, 2014; Pritchett et al., 2012; Bohnke & Zurcher, 2013; Kadirova, 2014. The various studies find ambiguous results on whether developing countries benefit from receiving aid. International multilateral institutions like the World Bank argue that they give aid to help poor/on-the-margin countries develop and eventually sustain themselves. However, contemporary research on subnational aid allocation shows that aid does not reach the areas in a country that need it the most, considering aid for development purposes (Öhler and Nunnenkamp, 2014; Nunnenkamp et al., 2017; Briggs, 2017; Briggs, 2021). On the other hand, most researchers agree that aid rushes to countries after a natural disaster to give humanitarian relief (Rodella-Boitreau & Wagner, 2011 and Strömberg, 2007). For example, in January 2010, Haiti's capital Port-au-Prince was destroyed by an earthquake, and the aid allocated to this natural disaster was focused on rebuilding the most affected regions (Soden & Palen, 2014). A natural disaster is completely exogenous to politics, which could be why studies find aid allocation successful in such events. But what happens with aid allocation after a war? Wars are politically endogenous, which means that for aid to sustain peace and facilitate reconciliation and reconstruction, it must also be politically motivated.

However, few studies are exploring subnational aid allocation in a postwar country. This paper fills that crucial gap in the aid literature by exploring aid allocation by three different donors in postwar Sri Lanka. The donors included in this paper are the World Bank, the Asian Development Bank, and the People's Republic of China (PRC).

We picked Sri Lanka for our case study for four reasons: (i) The Sri Lankan conflict did not end with a negotiated peace settlement. Instead, it was a 'winner-take-all' end to the conflict, which is uncommon; most contemporary internal conflicts see an end with a negotiated peace. For example, Zambia, Namibia, and El Salvador ended with a negotiated peace. This aspect of the end of the conflict makes ethnic reconciliation even more important since

there was no peace agreement following the end of the war that could have addressed the underlying ethnic grievances that led to war and grievances stemming from the actual war.

(ii) the Sri Lankan conflict was contained in particular geographical areas of the island. Hence, the districts affected by the conflict are easy to determine, making the identification strategy easier for empirical analysis.<sup>1</sup>

(iii) marginalized ethnicities mostly inhabit the geographical locations affected by war.

(iv) one of the biggest donors in Sri Lanka is the PRC. Other donors include the World Bank, Asian Development Bank, OECD-DAD countries, Iran, and India. The traditional donors from the West have conditionalities such as economic performance, governance reforms, and human rights conditionalities. However, non-traditional donors like the PRC comparatively have little to no conditionality on their Official Development Assistance (ODA). This makes aid conditionality less effective on the global scene and particularly less effective in Sri Lanka because the PRC is a great substitute in the donor market. In a nutshell, Sri Lanka is a useful case study as it is a special case in some ways (winner-take-all end) but also not so special in other ways (pivoting more to the PRC as a donor than Western countries). This particular intersection is enlightening as it gives us an insight into what happens in a postwar country where long-term sustainable peace hinges on ethnic reconciliation, but the leaders of the country are unwilling to address it. International pressure is insufficient to address these issues with the PRC as a prominent donor.

In this paper, we use AidData's ODA dataset on the World Bank and the PRC combined with a collected and geocoded dataset by the author on aid from the Asian Development Bank. We use Geographical Information Systems (GIS) to geocode and extract this geocoded data at the district level (ADM2), map the projects visually, and analyze spatial clusters. Additionally, we do an econometric analysis to determine the validity of the visual maps by controlling for economic development. The visual maps show a significant lack of projects in the conflict-affected districts. The empirical analysis shows that the war-affected districts do not receive more aid than other districts. Even though the main focus of this paper is the postwar aid allocation, we look into aid distribution following the tsunami to show that in Sri Lanka, areas affected by natural disasters were adequately prioritized, which we do not find for war-affected areas. Based on the Sri Lankan case, it would seem that donors tend to take the path of least resistance, which ends up further marginalizing the people they might have intended to give relief.

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<sup>1</sup> The conflict districts are Ampara, Batticaloa, Jaffna, Kilinochchi, Mannar, Mullaitivu, Puttalam, Trincomalee, and Vavuniya (see figure 2)

Econometrics combined with GIS has become a more widely used methodology in studying aid. However, this methodology is still relatively new in studying aid in a postwar setting. This paper underlines the importance of the geographical allocation of various aid projects within a country and how these allocations can reinforce domestic racist politics targeted at already marginalized ethnic groups. Additionally, this paper contributes a new dataset of the Asian Development Bank's (ADB) aid projects in Sri Lanka. This is an important contribution in the Sri Lankan case since ADB has had the longest multilateral relationship with Sri Lanka and is the country's biggest donor out of the three donors in this study.

The following subsection gives a brief contextual description of the grievances leading to the war; section 2 reviews the literature on subnational aid allocation and the research question springing from that literature; section 3 describes the utilized data; section 4 specifies the empirical methodology, section 5 presents the GIS and econometric analyses results, and finally section 6 concludes this study and offers suggestions for future research.

### **Sri Lankan historical context**

The Sri Lankan population of 20 million can be sub-grouped into 75% Sinhalese, 11% Sri Lankan Tamil, 9% Moors, and 4% Indian Tamils (Census 2011). The conflict between the government and the Liberation Tigers of Tamil Eelam (LTTE) lasted from 1983 to 2009, primarily fought over the independence of traditional Tamil homelands in the northern and eastern parts of the island. The conflict was caused by horizontal inequality, including access to education, employment opportunities, urban development, agricultural development, and political exclusion of Sri Lankan Tamils. President Mahinda Rajapaksa ended the war in 2009 with global support and ruthlessness, resulting in more than 40,000 civilian deaths, 300,000 internally displaced Tamils, and a government that did not acknowledge the need for state reform or ethnic conflict (Amnesty International, 2009). The government's approach to reconciliation through infrastructural development has resulted in a semi-authoritarian and highly centralized state that is nepotistic, nationalistic, militarized, and dismissive of minority grievances (DeVotta, 2010; Wickramasinghe, 2010; Jezeel & Ruwanpura, 2009).

Post-conflict Sri Lanka's reconstruction efforts have further excluded and dispossessed minorities due to the historical trajectory of post-colonial state formation and capital in Sri Lanka, authoritarian regimes, and global political agendas from donors (Kadirgamar, 2017). While reconstruction is necessary to alleviate hardships, the centralization of initiatives and domination of minorities may lead to conflict rather than trust-building. Therefore, the Sri Lankan government's soft authoritarianism and failure to acknowledge and address minority

grievances may exacerbate pre-war issues, such as high youth unemployment and Sinhala resettlements, and create new conflicts (Höglund & Orjuela, 2011).

## **SUBNATIONAL AID ALLOCATION – A REVIEW OF THE LITERATURE**

This section briefly summarizes the literature on subnational aid allocation across countries. We survey this literature to fit the Sri Lankan context into existing themes.

Most studies on aid have been cross-country studies or focused on large geographical spaces such as Sub-Saharan Africa. Aid allocation has been studied within countries or what is also called subnational aid allocation in recent years, but the literature on this topic is still rather scarce. The literature highlights that the main issue with subnational aid allocation is that aid does not go to the poorer or regions that need it the most. For example, Öhler and Nunnenkamp (2014), Nunnenkamp et al. (2017), Briggs (2017), and Briggs (2021) do not find any evidence that donors' aid allocation takes regional needs into account and that aid flows to wealthier and more accessible regions than others. Bilateral and multilateral donors face similar challenges in aid targeting. It is not enough to simply give aid to poor countries – locations within these countries with an obvious need for aid lack priority (Nunnenkamp et al., 2017).

The literature explains why regions that need aid are not targeted. Öhler and Nunnenkamp (2014) argue that the regional aid allocation may reveal personal, regional, and ethnic favoritism in the recipient countries. The authors highlight that political leaders in these countries may direct aid funds to their home regions irrespective of local needs. The authors also find that conflicts discourage World Bank projects, perhaps not surprising considering foreign officers' safety and security issues. Briggs (2021) finds that the World Bank Task Team Leaders (TTLs) face career pressure to get many projects approved and make sure that their projects are rated well internally and by the WB's Independent Evaluation Group (IEG). TTLs think aid projects are harder to implement in poorer places, rural areas, and remote parts (tarmac bias). Briggs (2021) speculates that perhaps aid is steered away from such areas because implementation is time-consuming, and incentive structures within the WB encourage TTLs to select easy implementation projects.

Like Öhler and Nunnenkamp (2014), Briggs (2021) finds that TTLs believe that recipient governments target aid to presidential home regions and their supporters. However, TTLs in Africa think getting approval for projects targeted to presidential home regions is difficult, which could be why PRC aid favors presidential home regions and not World Bank aid in Africa. Öhler et al. (2019) find that aid is allocated to areas with higher population density than poorer areas. They also find that capital cities receive disproportionately higher shares of World Bank funding on average, which the authors guess is due to political economy considerations in terms of the visibility

of projects. Furthermore, the authors emphasize that security considerations will likely affect aid allocation in countries with security risks. This presents a clear trade-off as areas exhibiting less security tend to be poorer. Hence, aid allocation patterns may positively correlate with more prosperous, safer areas. Lastly, Öhler et al. (2019) find that the fungibility of aid across sectors within countries plays an important role. Because aid is fungible, it might not be possible for donors to target specific ethnic, religious, or income groups since governments tend to adjust their own spending according to the aid they receive.

In these cross-national studies, the literature on subnational aid allocation shows that aid does not reach the poorer regions, aid goes to places that are densely populated such that donors can see quick results from their projects, aid tends to find its way to the country's leader's birthplace/supporters, and aid does not go to places with security concerns.

Due to these conclusions reached by previous work, this paper investigates aid allocation within one postwar country that has experienced an ethnic conflict for almost 30 years, and the impact aid allocation has had on reconciliation, which is an important aspect of long-term sustainable peace (Conteh-Morgan, 2005; Duman, 2017). This study will help the aid literature better understand how aid patterns and donors work with domestic politics to enhance existing ethnic grievances in a postwar environment.

Since the end of the war, the government has focused on rebuilding and developing the island with help from international loans and aid. However, research shows that the country still deals with many of the issues that existed in the pre-war period (Ruwanpura et al., 2020, Tudor et al., 2018, Sarvananthan, 2016). In particular, Kadirgamar (2017) writes, "Rural livelihoods remain precarious, incomes fall far below expenditure, and employment opportunities are minimal." (p. 4).

Ideally, the expectation following a conflict is to reconcile the war-affected regions back into the country by investing in them to rebuild and prosper, just like what happens following a natural disaster. This initiative can be done by the central government or the international community through aid donors. In this paper, we focus on the role of aid donors. If aid plays a vital role in sustaining peace in a country, as the literature on aid suggests (Boyce, 2002; Ndikumana, 2015), then aid distribution within a country is also important. If aid is not equally distributed across the country and ethnic groups, then the gains from aid will be unequal. Unequal gains from aid might undermine peace consolidation in a postwar country.

Thus, the main research question investigated here is whether aid reaches the war-affected districts. In exploring this question, we keep the conclusions reached by the subnational aid literature in mind and include controls for wealth and population density at the district level and the presidential home district. We would also be wise to remember that Sri Lanka was affected by a devastating tsunami in December 2004, significantly impacting the aid

environment even in the aftermath of conflict. Hence, the analysis also includes tsunami-affected districts as a control variable.

## DATA

For this study, we merged four data sets. We used AidData for both the World Bank and PRC. In addition, we collected data aid data from Asian Development Bank's project reports following AidData's methodology as closely as possible. We also used economic indicators from the Sri Lankan National Statistical Bureau.

The World Bank's geocoded data for Sri Lanka covers 2002-2015. The commitment amounts are deflated into constant 2011 USD except for transactions in 2013 and after. Those numbers are reported in current USD.

The PRC projects are in a dataset that includes 3485 PRC-funded development projects implemented in 6190 locations in 138 countries from 2000 to 2014. In particular, this paper takes advantage of the dataset called 'oda-like\_flows.csv'. For Sri Lanka, this data covers 90 projects over the specified time. The amounts in this dataset are deflated into constant 2014 USD.

The third data set is constructed using project reports of aid projects funded by the Asian Development Bank. There are projects from 1968 to 2017. Since this data is combined with the PRC and World Bank aid data, the relevant years are 2002-2014. ~119 projects were extracted from the ADB's website and geocoded manually by the author. The data collected consists of commitment amount, year of project approval, project categories, and geographical locations at the ADM2 level(districts). This is the information utilized to match the AidData sets. The amounts are reported in current USD. We believe that by including this new data on Asian Development Bank aid projects, we reduce the level of omitted variable bias that could easily occur in these types of studies where all aid projects from every donor are not geocoded and thus cannot be included.

We removed projects with no specific geospatial identification for the three aid data sets, such as projects labeled 'country-wide' instead of a district or address.

Lastly, Sri Lanka's National Statistical Bureau provided average economic development indicators on the district level, albeit only for two years; 2009/2010 and 2012/2013. There are statistics from earlier years, but the war-affected districts are not covered. Since those districts are essential in assessing positive peace, those initial surveys are not included in this study. The variables gathered as economic development indicators fall into the following categories: Gini, poverty gap, energy consumption, education, material things owned by the households, and gender.

The units of observation are district averages, and in 2010 there are 22 districts in the survey. However, in 2013, there are 25 districts. Mannar, Mullaitivu, and Kilinochchi are added from the northern region. One can assume



that those districts were excluded from the 2010 survey because of war vulnerability. Unfortunately, we could not attain the underlying household surveys of the district averages. These household surveys are available only in person at the National Statistical Bureau in Sri Lanka.

Since all three data sets on aid projects are reported in different prices (some in current and some in constant with different bases), we deflated the current prices to constant 2014 USD prices, and the constant 2011 USD prices were rebased to 2014 USD prices. This was done using the 'Gross domestic product (implicit price deflator), Index 2012=100, Annual, Not Seasonally Adjusted' series from the Federal Reserve Bank of St. Louis. More details on how the data sets were merged can be found in the appendix. The final dataset spans 2002 to 2014, containing 22 districts and 47 observations. It should be noted that there are some 'aid' observations, which are 0. In this study, those observations are interpreted as 'the given district did not receive aid that year' rather than a missing observation.

Lastly, we added population density to our data set, which only exists across districts for 2012.

In this paper, we study commitments for projects rather than disbursement. The biggest reason for this choice is that this is the available data for most donors. Briggs (2017) mentions two biases which are the following: (i) using commitments instead of disbursements will likely bias the results towards exaggerating how much aid reaches the poor, and (ii) using data on project aid will also likely lead to bias if one is trying to conclude the degree to which aid, in general, is controlled or targeted by donors. However, these biases are raised based on past behavior from Western donors. This study includes PRC as an aid donor that claims no involvement in sovereign politics and dealings with alleviating poverty. Hence, in this study, our results may not be as exaggerated as Briggs (2017) predicts.

### Descriptive statistics

This section presents descriptive statistics of the data used for regressions. Table 1 presents aid by the three donors included in the data set and the average amount of money they have committed over the entire time period (2002-2014).

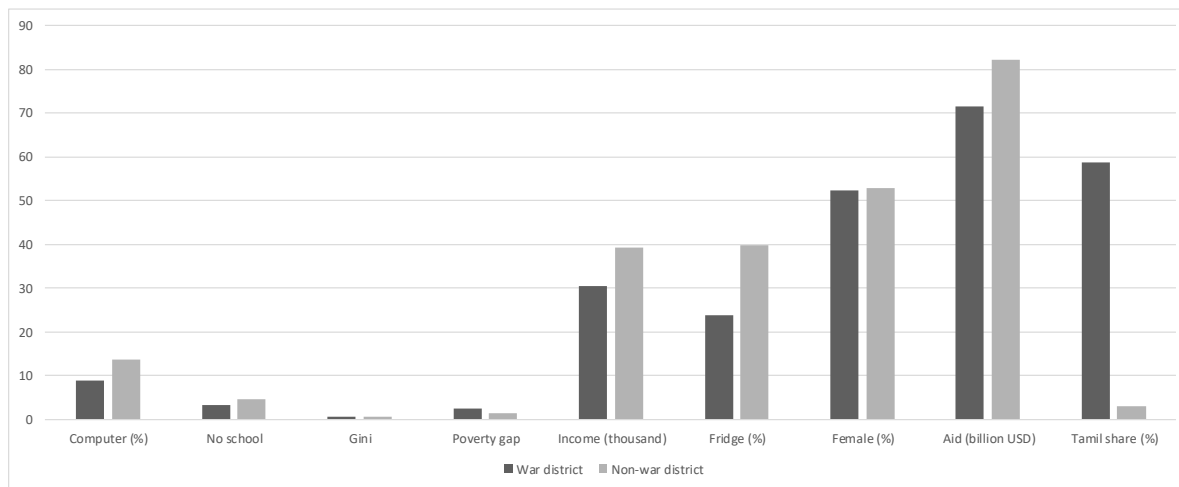
**Table 1. Aid by donors over 2002-2014, in billion, 2014 USD**

	N	Sum	Mean	Std .Dev
Asian Development Bank	157	17100	109	151
PRC	26	2100	80.9	130
World Bank	156	6300	40.4	52.5
Total	339	25500	230.3	333.5

As shown in Table 1, the ADB has had a longstanding relationship with Sri Lanka, making it the largest donor among the three donors included in this study. The World Bank and ADB have the same number of projects during the selected time. PRC has few projects, but they are expensive.

Figure 1 presents the economic development indicators for war and non-war districts. These included variables constitute confounding variables, i.e., factors that might be related to a district's underlying propensity for experiencing conflict *and* its likelihood of the need for aid.

**Figure 1. Average economic indicators for war and non-war districts, 2009/2010 and 2012/2013**



Source: Sri Lankan National Statistical Bureau

Notes: Dark gray indicates war and light gray indicates non-war districts. On average, war districts are poor.

It is evident from Figure 1 that, on average, conflict-affected districts are significantly poorer than districts that were not as affected by it. The figure also shows that war-affected districts have a higher share of Tamils. Additionally, it is evident that, on average, war districts received less aid than other districts. We will investigate these revealed patterns further in the following sections.

## EMPIRICAL SPECIFICATION AND VARIABLES

The paper uses GIS analysis for geocoding, mapping, and analyzing spatial clusters while using econometric analysis to expand the analysis further. This section presents the econometric modeling and considerations used in this study.

### Econometrics methodology

To investigate whether aid goes to districts that had been affected by the war, we consider a simple Ordinary Least Square (OLS) approach:

$$\log (Aid\ amount)_{it} = \beta_0 + \beta_1 war_i + \beta' X_{it} + \epsilon_{it}, \quad (1)$$

where  $X_{it}$  is a vector factor that includes development indicators such as education, poverty levels, and inequality as well tsunami-affected districts, leader's birthplace, and population density,  $i$  indicate the districts,  $t$  indicates the year. The dependent variable 'aid amount' is the log of aid in constant 2014 dollars, 'war' is a binary variable taking the value 1 if the district was affected by the war and 0 otherwise. We should note that we have chosen to keep this binary variable fixed for simplicity for all periods, even though the conflict ended in some districts before 2009.

The districts affected by the war are shown in Figure 2 below: Ampara, Batticaloa, Jaffna, Kilinochchi, Mannar, Mullaitivu, Puttalam, Trincomalee, and Vavuniya.

**Figure 2. War affected districts**



Notes: Created by the author using GIS and data from Sri Lanka National Statistical Bureau and Uppsala Conflict Data Program (Date of retrieval: 21/09/14) UCDP Conflict Encyclopedia: [www.ucdp.uu.se](http://www.ucdp.uu.se), Uppsala University

All regressions include time-fixed effects and district clustering to take spatial correlation into account. Because there are only 47 observations of each economic indicator, we take a regression approach where we include each control variable separately and show one model with the variables that turned out to be statistically significant (see tables A3 through A5 for the full regressions). This also helps avoid a reduction of degrees of freedom.

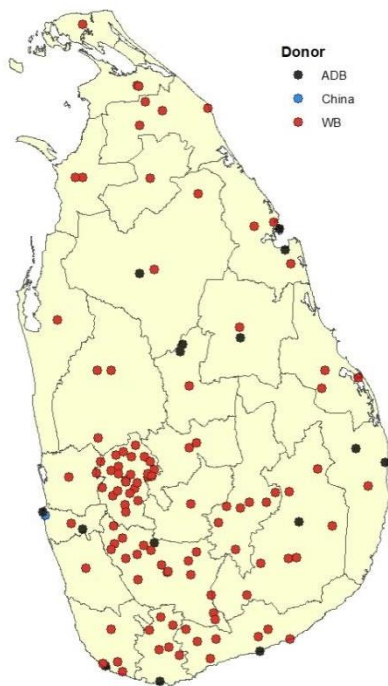
## **RESULTS**

This section presents the findings from GIS and the econometric analysis. The first section presents the development in aid allocation over the years in Sri Lanka. Sri Lanka experienced a tsunami in 2004, drastically changing the country's aid allocation patterns. Hence, we show maps from before the tsunami, after the tsunami but before the war, and after the war.

### **Aid project locations over time**

Figure 3 shows the aid projects sponsored by the World Bank, PRC, and the Asian Development Bank from 2002-2014. These are projects approved/committed to before the tsunami in late December 2004.

**Figure 3. Project aid commitments, 2002-2004**



Source: Author's construction

Note: Sri Lanka district boundaries and the geocoded aid projects before the tsunami in December 2004 are the layers in this map. Aid projects are most prevalent in the southern part of the country, and the most active donor is the World Bank.

The points on the map are geographical indications without considering the amount of money committed. The different symbols indicate different donors. It is worth noting that just one PRC project was reported during this time. This could be because the data collection for PRC projects started in 2000<sup>2</sup> it could be because the PRC involvement in Sri Lanka only really took off from approximately 2005 with President Mahinda Rajapaksa.

This map shows that most donor projects were allocated in the southern part of the country. Only some projects are scattered in the North, East, and Central regions.

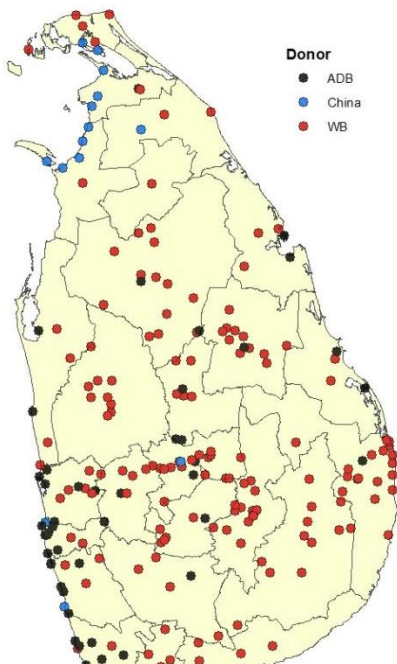
One can explain this disparity through war. During this time period, the war in Sri Lanka was intense, and the LTTE had gained control over large parts of the northern and eastern regions. Humanitarian aid could still reach those areas, but because the LTTE wanted aid to go through them, the bureaucracy could have made those regions less attractive for aid projects from the donor's perspective (Kadirgamar, 2017). Furthermore, few donors were interested in working in highly volatile war zones.

The map in Figure 4 shows the location of aid projects from 2005-2009. These are projects committed after the tsunami until the year the war ended. After the tsunami, we can see that PRC became more involved in the Sri Lankan aid environment following President Rajapaksa's election. Most projects are still located in the South and the Southwest regions, but there is a definite increase in projects in the central part of the island and some PRC projects on the northern coast. However, there are fewer coastal projects than expected (see figure 5 for where the tsunami affected the country the most).

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<sup>2</sup> The 2.0 version of the Global Chinese Development Finance Dataset from AidData might have uncovered new projects during this time. This paper utilizes version 1.0.

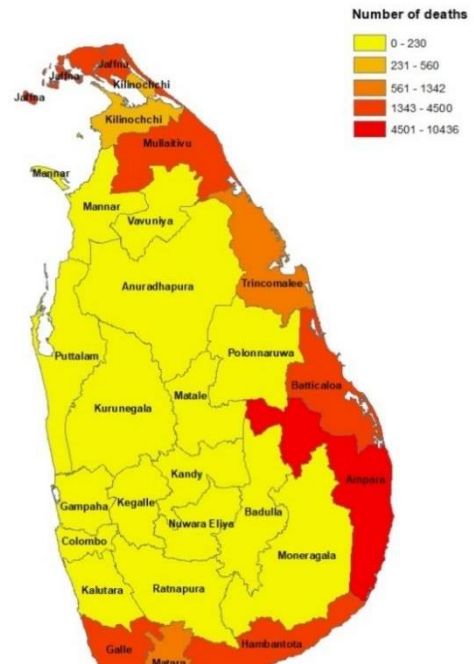
**Figure 4. Project commitments in the post-tsunami period, 2005-2009**



Source. Author's construction

Notes: The layers included are Sri Lanka district boundaries and geocoded aid projects, 2005-2009. The number of projects on the island has increased and is more widely disbursed, but the southern part still dominates the aid projects.

**Figure 5. Tsunami affected districts**



Source. Author's construction and Sri Lanka National Statistical Bureau

Notes: The layers included are Sri Lanka district boundaries and number of deaths caused by the tsunami Dec. 26<sup>th</sup>, 2004.

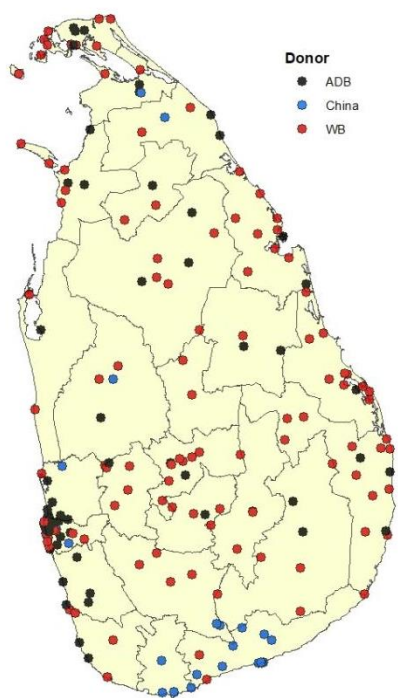
This is puzzling given the massive inflow of aid during this time after the tsunami. Holt (2011) estimated almost a doubling of aid from before to after the tsunami. However, McGilvray and Gamburd (2010) explain that this seemingly unequal distribution of aid, observed in Figure 4, could be due to what is known as 'tarmac bias' in the development and disaster literature: *"... the better roads and airport access meant that organizations and individuals with money – whether local or international – could more easily and quickly deliver aid to the south and west"* (p. 29, McGilvray and Gamburd, 2010).

Additionally, patronage politics and corruption are essential factors in how aid was allocated during the post-tsunami period. Patronage and corruption continue to influence aid allocation even today. The Sri Lankan patronage political system allows powerful politicians to funnel money to where they want to. Since most Sri

Lankan powerful politicians are Sinhalese, they assured that most of the aid was allocated to the Sinhalese-dominated South and West (McGilvray and Gamburd, 2010).

The projects depicted on the map in Figure 6 are committed projects from 2010 to 2014. Similar to the maps in Figures 4 and 5, the points shown are the geographical locations of aid projects, and colors identify donors.

**Figure 6. Project commitments in the post-war period, 2010-2014**



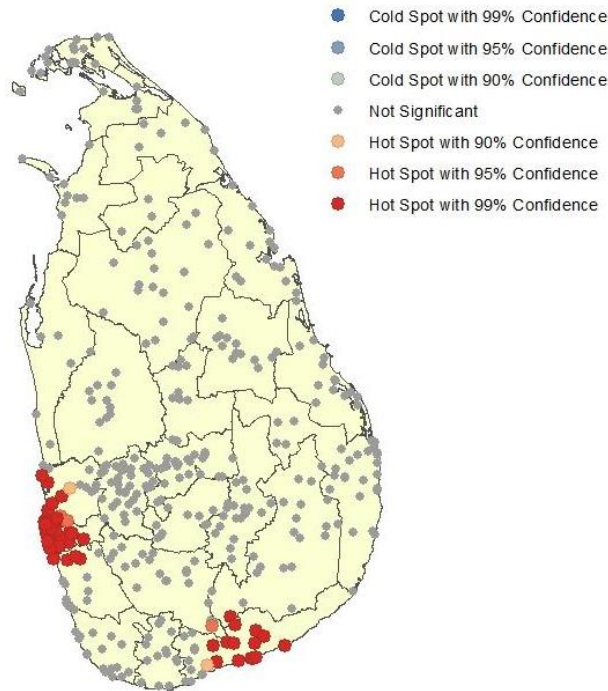
*Notes:* The layers included are Sri Lanka district boundaries and geocoded aid projects. More activity from the PRC and Asian Development Banks as donors, and more projects seem allocated to the northern and eastern parts.

There is a concentration of projects in Colombo. An increase in PRC projects in the South is obvious from the map. Figure 7 investigates the validity of these clusters even further. Additionally, there are more projects in the North and the East than before and immediately after the tsunami.

Figure 7 illustrates clusters of projects in terms of the amounts committed, both significant and insignificant clusters. So far, we have only investigated the count of projects. However, this map is based on the amount of money in various places and solidifies the findings from the previous figures. In addition, this map reveals historical aid patterns that can be further investigated in the econometric analysis. Figure 7 shows two highly

significant clusters of projects throughout the 2002-2014 period (where data was available and collected for this study), namely Colombo and Hambantota, both located in the Sinhalese-dominated areas.

**Figure 7. Hot spot map of aid commitment amounts, 2002-2014**



Notes: The layers included are Sri Lanka district boundaries and geocoded project amounts analyzed into clusters. The ArcGIS website explains the methodology behind hot spot maps as follows "The [Hot Spot Analysis](#) tool calculates the Getis-Ord Gi\* statistic (pronounced G-i-star) for each feature in a dataset. The resultant [z-scores and p-values](#) indicate where features with high or low values cluster spatially. This tool works by looking at each feature within the context of neighboring features. A feature with a high value is interesting but may not be a statistically significant hot spot. To be a statistically significant hot spot, a feature will have a high value and be surrounded by other features with high values as well. The local sum for a feature and its neighbors is compared proportionally to the sum of all features; when the local sum is very different from the expected local sum, and when that difference is too large to be the result of random chance, a statistically significant [z-score](#) results. When the [FDR correction](#) is applied<sup>3</sup>, statistical significance is adjusted to account for multiple testing and spatial dependency." (source: <https://pro.arcgis.com/en/pro-app/tool-reference/spatial-statistics/how-hot-spot-analysis-getis-ord-gi-spatial-statistics.htm>).

The aid hotspots are in Colombo and Hambantota, which did not suffer through the conflict.

The significant cluster of donor money in the Colombo district is unsurprising, knowing the Sri Lankan postwar economic development model, which aligns with the PRC's idea of development – infrastructure. From the outside, this cluster of projects could be explained as capacity-building projects allocated to the public sectors. Most public sector headquarters are in the capital city of Colombo. However, from the inside, Colombo became

<sup>3</sup> FDR is an abbreviation of False Discovery Rate. It is the expected proportion of type I errors or so-called false positives. A type I error is where one incorrectly rejects a null hypothesis.



a city filled with beautification projects that made it look and feel like a high-end metropolitan city aimed to rival Hong Kong, Singapore, and Dubai (Chan et al., 2019). But this state-led city-wide infrastructural development resulted in the displacement of working-class neighborhoods, militarized land acquisitions, and disenfranchisement (see Perera, 2014, 2015; Fuglerud, 2017; Abeyasekera et al., 2019).

Additionally, this result seems to follow the subnational literature as Öhler et al. (2019) also find that aid gets allocated disproportionately to the capital city of countries.

The second cluster of projects is in Hambantota, where Rajapaksa is from and where a large part of his constituency is. Rajapaksa had a personal agenda to develop the region. As he was a major player in bringing in the PRC as a donor, he likely influenced where especially the PRC donations went. Another explanation for this cluster could also be that Hambantota was heavily affected by the tsunami (see Figure 5) in 2004. Previous literature on Sri Lanka has established that Hambantota disproportionately received aid following the tsunami.

### **Econometric Analysis Results**

Donors have different behavior and political agendas influencing their decisions on aid project locations. For instance, Öhler and Nunnenkamp (2014) argue that World Bank is hesitant to locate aid projects in conflict areas. To better understand donor behavior, the following table shows the regressions from equation (1) for each donor included in the sample, i.e., World Bank, Asian Development Bank, and the PRC. We aim to explore if the different donors prioritize different aspects of a country when deciding where allocation should go. This table includes not all the regressions but only the final models for each donor. See the appendix for the full regressions for each donor.

**Table 4. Donor behavior and aid allocation, 2010-2015**

	(1) World Bank	(2) Asian Development Bank	(3) PRC
War	4.013** (1.835)	0.871 (3.262)	-3.054 (1.943)
Leader's home	0.517 (0.655)	0.389 (2.806)	4.996*** (1.779)
Obs.	47	47	47
Population density	yes	yes	yes
Need controls	yes	yes	yes
Year FE	yes	yes	yes
R-squared			
Within	0.82	0.40	0.10
Between	0.52	0.13	0.65
Overall	0.74	0.32	0.40

Notes: Robust standard errors are in parenthesis clustered by districts. All models include year fixed effects, population density, and controls indicating the need of the district. The need variables are share of the population owning computers and fridges, average calories, Gini coefficients, poverty gap, share of females. The controls also include districts affected by the tsunami.

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

Column (1) presents the results from the model estimated on World Bank commitments alone. Unlike our expectations, when the World Bank decides where to allocate aid money, war-affected districts are 4 times more likely to receive aid than others. Leader's home, i.e., Hambantota, is positive but statistically insignificant.

Column (2) shows the results from Asian Development Bank commitments. The coefficient of war is positive but statistically insignificant. A similar result is found for the statistical association with the leader's home district.

PRC ODA commitments and the model estimation in column (3) show interesting results. The coefficient of war is negative but statistically insignificant. Unlike other regressions, Rajapaksa's home district is almost 5 times more likely to receive aid than any other district.

Looking at both the aggregate aid level from the GIS analysis and the individual donors, we see that Hambantota has had a very high influx of aid projects. The district is not very densely populated, nor did it already have the potential to become a significant trade port compared to other coastal districts. The district distinguishes itself from other districts because it is the home district of the entire Rajapaksa family that had taken over the Sri Lankan government.

Since 2010, under Rajapaksa's regime, the main focus of government policy was economic recovery and infrastructure development in the war-scarred regions of the country. More specifically, the Rajapaksa government developed a "Sri Lankan model", involving humanitarian action, resettlement, and reconstruction (Goodhand, 2010). This model meant regional autonomy was very low on the political agenda, especially in the Northern province. Rajapaksa believed that as the minority felt the economic and infrastructural development benefits, they would automatically be reintegrated into the rest of the country (Uyangoda, 2011). This infrastructural economic development reconciliation approach aligns closely with the PRC's approach. However, the state-sponsored infrastructure projects were contracted to large foreign companies, such as PRC-based companies or large Sri Lankan companies based in the Western Province. The PRC-based companies would even use a substantial amount of imported Chinese labor. Hence, the trickle-down effect on the local people in the Eastern, Northern, and Southern Provinces regarding youth employment or profit generation was limited (Sarvananthan, 2016).

The PRC's increased role in the Sri Lankan development model and the failure of the reconciliation with war-torn districts beg the question of how the PRC became such a big player in Sri Lanka.

At the end of the 2002-05 peace process. The government, in turn, viewed Western donor's aid projects with suspicion, especially in the Northeast. Rajapaksa's regime was suspicious that the Western donors were operating with the Sri Lankan Tamil diaspora's political agendas (resurrecting the LTTE) and scrutinized these projects with high surveillance and control. Since aid was still needed, PRC became the perfect substitute for Rajapaksa as his preferred donor, lender, and implementer (Venugopal, 2018). Given that the PRC was Sri Lanka's preferred donor and a close ally to Rajapaksa's infrastructural development approach to reconciliation led to many expensive projects in his home districts, which yielded little to no economic return.

The postwar economic development path in the entire country, not just in the Eastern and Northern Provinces, was driven by massive infrastructural development projects such as highways, an international airport and harbor in Hambantota, power supply restoration in the North, an international sports stadium in Kilinochchi district, Mattala Rajapaksa International Airport and Magampura Mahinda Rajapaksa Port in the Vanni (Sarvananthan 2013). One issue with such a blanket approach to economic development is that the development projects did not match the specific circumstances and priorities of the local population in various provinces, and one of the enduring challenges is how to tap the available local resources, including the workforce and the land and sea resources, optimally in developing these industries. For instance, Kadirgamar (2017) points out two primary sources of livelihood in the North: agriculture and fisheries. However, agriculture suffers from crop failures and high fluctuations in market prices, while fisheries suffer from the Indian trawlers roaming the Sri Lankan waters and destroying the Jaffna fishers' nets, limiting them to shallow Western donors became highly critical of the Rajapaksa government matters. Moreover, on top of the economic challenges, issues such as family and community breakup, alcoholism, trauma, debt burden, ethnic resentments, and caste and gender disparities do interfere with recovery and reconciliation as well as livelihood development in general (Tudor et al., 2018). This economic development approach was promoted in place of a political solution to the ethnic conflict. The Rajapaksa government had, from the beginning, been skeptical of the existence of an ethnic conflict with genuine underlying grievances. Instead, it had chosen to view it as a terrorist threat fueled by regional underdevelopment. As a result, Rajapaksa was resistant to the idea of recognizing, engaging with, or addressing Tamil grievances through state reforms and any process of accountability. Instead, his government sought to fast-track economic and infrastructure development in the northeast and use this as a political weapon to win the support of the Tamils and undermine the appeal of ethnic Tamil politics (Venugopal, 2018).

Arguably, after a war, such infrastructure growth is necessary, but the relative lack of investment in creating livelihoods and jobs has led to joblessness in the post-war period (Kadirgamar, 2017).

Hence, because donors did not make an effort to tailor projects to the needs of the geographic locations, economic growth in those underdeveloped regions remains lacking. Furthermore, the failure to recognize the ethnic grievances and address them when deciding on aid projects has contributed to an aggravation of ethnic tensions, only fueled more by the central government.

Secondly, political patronage is crucial in Sri Lankan public resource allocation. For example, when this author traveled to Vanni in 2017 (one of the areas most affected by the war), we spoke with some women who had lived in the same house throughout the war. These women explained that the central government allocated (and continues to allocate) plenty of money to the Northern Province after the war. However, most of it was sent back to the central government every year because the politicians were unqualified to manage the budget and spend it on job creation, education, or other rebuilding programs. Whether this is true or not is less important than the fact that this is what they believed about the allocation of resources in Sri Lanka and the capacity of their own politicians. Their point was underlined by an activist, wishing to remain anonymous, from Jaffna, saying that immediately after the first election in the Northern Province for the Northern Province Council (NPC) in 2013, there was a substantial discussion of the NPC's failure to utilize the funds provided to them. Approximately 40 % of the funds were sent back to the central government. The lack of local political leadership is also highlighted by Kadirgamar (2017). Achieving lasting reconciliation with the Tamil, albeit any minority in Sri Lanka, broadly comes under what Venugopal (2018) calls 'de-Sinhalizing' the state, translating into the devolution of powers from Colombo towards Tamil-dominated areas. The fear of rebel mobilization in the war-affected areas caused Rajapaksa's Sinhala-Buddhist nationalistic government to prioritize hardware development (infrastructure) over software (political training) (Venugopal, 2018). Since Western donors no longer prioritize hardware development and specialize in software, it allowed the PRC to fill the necessary gap and become a prominent donor in Sri Lanka.

### **CONCLUSIONS, LIMITATIONS & FUTURE RESEARCH**

Using a GIS analysis with econometric analysis, this study does not find that aid is targeted to the districts affected by the war in Sri Lanka on the aggregate level.

Even if the war-torn districts did not receive as much aid as other parts of the country, they did receive some aid, and reconstruction did happen. The reconstruction was simply not the kind of reconstruction needed to reconcile the affected districts with the rest of the country, both economically and politically. More investment in agriculture and fisheries in the districts was needed to boost the local economies. This would require better

cooperation between donors, local governments, activists, and grassroots organizations to understand and assess which development projects the local population could benefit from and ensure that the locals are part of the decision-making process. Additionally, donors entering a postwar aid climate could benefit from understanding the grievances that led to a conflict to ensure that their developmental aid projects do not exacerbate but address those grievances. Infrastructure-led economic development might not always be the solution, as it was in the case of the PRC. Like several studies on aid flows, this paper finds that donors could benefit from greater coordination to address core issues in recipient countries through aid. This, of course, becomes challenging with emerging donors not participating in aid transparency initiatives, such as the PRC. Thus, even though the PRC proclaims that they do not get involved in domestic politics because they respect the sovereignty, their aid and its allocation have significant effects. In particular, the geographical location of money significantly impacts long-term domestic politics, while in a postwar country also impacts reconciliation processes. Failed reconciliation processes could, in the future, lead to failed peace consolidation and renewed conflict. As the PRC is currently negotiating repayments across several countries in the global south, it would be in their interest to ensure some level of political stability among their lenders.

Note that the aggregate aid accounted for in this study is approximately 40 percent of total aid commitments from all donors from 2002-2014. Therefore, our findings may not carry over when all donors are included. The regression analysis is based on only 47 observations, so we should temper our conclusions. The "war" variable is positive but not statistically significant in most specifications, consistent with the narrative that aid goes where it is most needed. Thus, it is worth pointing out that the results might be null due to insufficient observations.

Future research on aid in postwar countries could include a greater focus on aid projects centered only on reconciliation and reconstruction rather than all aid projects. This might reveal a more robust pattern of aid allocation's correlation (or lack thereof) with postwar geographical areas. AidData has updated its datasets, and it might be worth updating the empirical evidence with additional years and more uncovered projects.

In addition, future research could include other official flows in combination with the central government's decision-making process on where to allocate development projects. It could also include a greater emphasis on the geopolitical consequences of the PRC's involvement as a donor and lender and the role of Sri Lanka in the greater Belt and Road Initiative.

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## Appendix

### Further Data Details

The subset data called 'level 1a' from the 2017 data set provided by AidData was used for the World Bank aid data. The time indicator chosen in this study is the variable named 'approval year', while the variable of interest (aid amounts) is the variable named 'even\_split\_commitments'. This particular variable was selected because some donors commit an amount for several projects without clarifying how much is going to which project. Therefore, to avoid looking through several hundred project reports, the 'even\_split\_commitments' variable averages the total amount committed by the donor on the total number of projects.

For the PRC aid, the time indicator is 'transaction start year'. A variable similar to 'even\_split\_commitment' was created based on 'project\_total\_commitment'.

This study uses a variable containing commitments instead of disbursement because the PRC data and the Asian Development data have little information on disbursements. One issue with this is that there is often a significant difference between what donors commit to and what gets disbursed. Thus, this study will not be able to evaluate aid projects in the traditional sense. However, we will be able to comment on the donors' political agendas and intentions based on their aid commitments.

Collecting aid data from the Asian Development Bank required going through all project reports in Sri Lanka by the Asian Development Bank from 2002 to 2014. The data collected consists of commitment amount, year of project approval, project categories, and geographical locations (districts).

The three data sets were merged using 'year'. After merging projects categorized as 'Nation-wide' or 'Sri Lanka' were excluded. All projects without geolocation were also removed.

To include the economic development indicators, which are district averages, the aid data needed to be on the district level as well. Therefore, the aid data was coded at a precise GPS location and not divided into districts (except for the ADB data). GIS was used to transform the data into district-level data. In particular, the ArcGIS 'Intersect' tool was used: a layer of districts only was created and then 'intersected' with the geocoded layer, which allowed the geolocations to be sectioned out on districts.

After extracting the aid data on district levels, the aid series had to be within donor, within a district, and within a year to be merged with the economic development indicators.

Table A1 presents the summary statistics of all the variables used in the model estimations.

### Table A1. Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Aid (2014 USD, millions)	325	78400	133000	0	1120000
Computer (%)	47	12.08	7.18	1.4	38.8
No school (%)	47	4.13	1.84	.9	9.1
Kcal	47	2142.17	143.305	182	2419
Poverty Gap	47	1.79	1.29	.3	6.2
Gini	47	.45	.045	.37	.57
Female (%)	47	52.57	1.11	49.7	54.5
Fridge (%)	47	34.71	15.56	3.2	74.7

A study on energy and nutrients amongst Sri Lankan adults by Jayawardena et al. (2014) finds that calorie intake by males was about 1900 compared to 1500 for women. Hence, the average across districts of 1541 seems very reasonable.

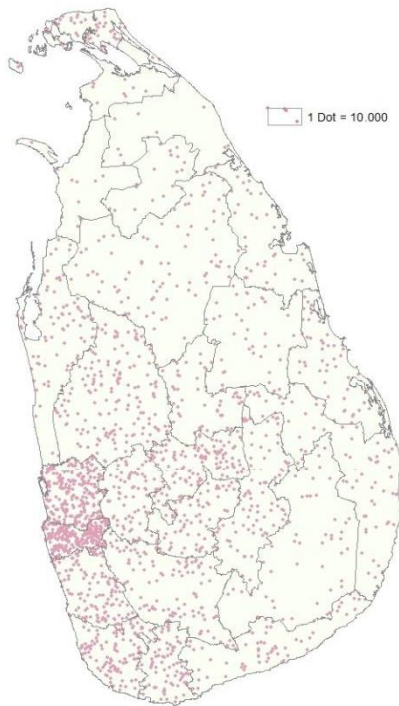
The poverty gap index is a measure of the intensity of poverty. It is defined as the average poverty gap in the population as a proportion of the poverty line. The poverty gap index estimates the depth of poverty by considering how far, on average, the poor are from that poverty line. According to the Department of Census and Statistics, the national poverty line in Sri Lanka in 2019 is Rs. 4849<sup>4</sup> PPPM, equivalent to approximately 27 dollars. A high poverty gap index means severe poverty.

A Gini coefficient of 1 (or 100%) expresses maximal inequality, whereas 0 expresses maximal equality. The national Gini coefficient was estimated to be approximately 0.4 in 2016, which suits the summary statistics.<sup>5</sup>

<sup>4</sup> [http://www.statistics.gov.lk/poverty/monthly\\_poverty/index.htm](http://www.statistics.gov.lk/poverty/monthly_poverty/index.htm)

<sup>5</sup> <https://tradingeconomics.com/sri-lanka/gini-index-wb-data.html>

**Figure A1. Population density map, 2012**



Notes: The layers included here are Sri Lanka district boundaries and population on districts from Sri Lankan Census 2012. The author constructed the map. The population is much denser in the southwest part of the country.

The map in figure 6 presents the population density in Sri Lanka in 2012. We might see clusters of projects or the absence of projects in individual districts because of high or low population density. Each dot in figure 6 is equivalent to 10,000. As can be seen from the map, there is a high population density in the Colombo district, where there are also many aid projects. Another thing to note is how sparsely the Northern region is populated. This, of course, is because of internal displacement due to the war and the tsunami. We will add population density to our regressions to ensure we control for the population.

Table A2 presents the results of a simple and initial OLS regression without any controls to get a sense of the signs of the correlation. There are two variations of the estimation shown in this table.

**Table A2. War aid allocation, 2010-2014**

	(1) Post-war	(2) Post-war
War	2.400 (2.474)	
Population density	0.003***	0.003***
War*share_tamil	(0.001)	(0.001) 2.376 (2.677)
Constant	19.013** *	19.456** *
	(2.385)	(2.160)
Obs.	47	47
Year FE	Yes	Yes
R-squared :		
Within	0.66	0.66
Between	0.21	0.20
Overall	0.50	0.49

Note: The dependent variable is the log of real aid. (1) is the regression for the years 2010-2014. The binary variable War is not significant. (2) is also for 2010-2014, where the interaction term between the binary variable War and the share of Tamils in those districts is not significant. Population density is positive and significant in both regressions, while all regressions include year dummies.

Column (1) presents results from a simple regression of war-affected districts and aid commitments, accounting for population. The regression helps answer the question: 'Did war-affected districts get more aid?'

War-affected districts include Ampara, Batticaloa, Jaffna, Kilinochchi, Mannar, Mullaitivu, Puttalam, Trincomalee, and Vavuniya. The model is estimated for 2010-2014, involving time-fixed effects.

Column (2) is the same as column (1) – the only difference is that the war-affected districts are split into predominantly Tamil and predominantly other ethnic groups. The predominantly Tamil war-affected districts are Batticaloa, Jaffna, Kilinochchi, Mannar, Mullaitivu, and Vavuniya.

**Table A3. Aid allocation, war, and level of development, post-conflict (2010-2014), World Bank**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
War	3.254** (1.410)	3.453** (1.518)	2.357 (1.661)	2.042 (1.363)	2.913** (1.395)	3.059** (1.445)	3.267** (1.464)	4.340** (1.942)	3.564** (1.524)	3.997** (1.809)	4.013** (1.835)
Population density	0.002* (0.001)	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.002* (0.001)	0.002* (0.001)	0.002* (0.001)	0.000 (0.001)	0.002* (0.001)	0.000 (0.000)	0.000 (0.001)
Computer (%)		0.110 (0.166)									
No school			-0.566 (0.656)								
Kcal.				-0.011 (0.007)							
Gini					-32.085 (25.454)						
Poverty gap						0.245 (0.470)					
Female (%)							0.025 (0.680)				
Fridge (%)								0.106 (0.089)			
Leader's birthplace									3.862** (1.659)		0.517 (0.655)
Tsunami										4.184** (1.919)	4.034** (1.967)
War#tsunami										-3.921** (1.926)	-3.782* (1.967)
Constant	16.919*** (2.633)	16.236*** (3.076)	19.988*** (4.035)	41.304*** (15.827)	31.413*** (10.767)	16.454*** (2.887)	15.611 (35.805)	13.899*** (4.255)	16.574*** (2.762)	16.264*** (2.826)	16.241*** (2.867)
Obs.	47	47	47	47	47	47	47	47	47	47	47
Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared											
Within	0.82	0.82	0.82	0.82	0.84	0.82	0.82	0.82	0.82	0.82	0.82
Between	0.45	0.46	0.49	0.50	0.43	0.45	0.45	0.48	0.47	0.52	0.52
Overall	0.73	0.73	0.73	0.74	0.74	0.73	0.73	0.73	0.73	0.74	0.74

Standard errors are in parenthesis

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

**Table A4. Aid allocation, war, and level of development, post-conflict (2010-2014), Asian Development Bank**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
War	4.956 (3.109)	5.804* (3.228)	1.654 (3.231)	4.399 (3.504)	5.160 (3.214)	5.538 (3.383)	3.179 (3.441)	6.429 (4.181)	5.415* (3.209)	5.081 (3.730)	0.871 (3.262)
Population density	0.001 (0.001)	-0.003 (0.003)	-0.001 (0.002)	0.000 (0.002)	0.001 (0.001)	0.001 (0.002)	0.001 (0.001)	-0.001 (0.003)	0.001 (0.001)	0.000 (0.002)	
Computer (%)		0.467 (0.419)									
No school			-2.084*** (0.692)								-1.787*** (0.575)
Kcal.				-0.005 (0.010)							
Gini					19.167 (32.613)						
Poverty gap						-0.731 (0.908)					
Female (%)							-3.418*** (1.057)				-3.232*** (1.232)
Fridge (%)								0.144 (0.168)			
Leader's birthplace									5.698*** (1.917)		0.389 (2.806)
Tsunami										3.097 (3.573)	
War#tsunami										-2.378 (5.536)	
Constant	9.060*** (3.182)	6.159 (4.426)	20.368*** (5.255)	20.274 (23.050)	0.401 (14.906)	10.447*** (3.577)	188.59*** (55.990)	4.967 (5.804)	8.551*** (3.253)	8.577** (3.511)	187.89*** (64.806)
Obs.	47	47	47	47	47	47	47	47	47	47	47
Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared											
Within	0.13	0.17	0.21	0.14	0.15	0.13	0.37	0.14	0.13	0.13	0.40
Between	0.17	0.19	0.23	0.16	0.15	0.21	0.04	0.22	0.20	0.19	0.13
Overall	0.14	0.16	0.23	0.14	0.15	0.15	0.25	0.16	0.15	0.15	0.32

Standard errors are in parenthesis

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

**Table A5. Aid allocation, war, and level of development, post-conflict (2010-2014), PRC**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
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War	0.244 (1.422)	-0.487 (1.310)	0.326 (1.387)	0.683 (1.317)	0.364 (1.445)	-0.211 (1.231)	0.051 (1.276)	-0.986 (1.282)	0.719 (1.189)	-0.856 (0.575)	-3.054 (1.943)
Population density	-0.001 (0.000)	0.002** (0.001)	-0.000 (0.000)	-0.000 (0.001)	-0.001 (0.000)	-0.000 (0.000)	-0.001 (0.000)	0.001 (0.001)	-0.000 (0.000)	-0.002** (0.001)	0.000 (0.001)
Computer (%)		-0.358** (0.148)									
No school			0.051 (0.229)								
Kcal.				0.004 (0.005)							
Gini					11.314 (8.889)						
Poverty gap						0.514 (0.591)					
Female (%)							-0.355 (0.371)				
Fridge (%)								-0.113* (0.064)			-0.137** (0.057)
Leader's birthplace									7.664*** (0.598)		4.996*** (1.779)
Tsunami										4.636** (2.101)	3.597** (1.753)
War#tsunami										-2.228 (2.281)	
Constant	0.349 (0.443)	2.536** (1.227)	0.070 (1.101)	-8.459 (11.932)	-4.762 (4.014)	-0.648 (1.330)	19.012 (19.298)	3.518* (1.954)	-0.399 (0.467)	-0.462 (0.430)	3.150** (1.571)
Obs.	47	47	47	47	47	47	47	47	47	47	47
Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared											
Within	0.09	0.14	0.09	0.11	0.12	0.09	0.07	0.10	0.09	0.09	0.10
Between	0.22	0.35	0.22	0.20	0.23	0.21	0.26	0.30	0.30	0.39	0.65
Overall	0.09	0.18	0.09	0.09	0.09	0.10	0.10	0.14	0.23	0.25	0.40

Standard errors are in parenthesis

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