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Abstract

This study presents an overview of the Survey of Conflict-Affected Regions in Sri Lanka that was conducted in 2018 as part of a joint research project on social reconstruction and poverty reduction after the civil war in Sri Lanka. We clarify our sampling strategy and the implementation of the household survey, as well as the merits and limitations of our survey data. We then provide a descriptive analysis of the survey data, from which several important findings emerge. More than half of the heads of households among the ethnic minority groups—the Sri Lankan Tamil and the Moor—are either casual workers or non-income earners. We also found lower levels of education and a higher number of female household heads and widows among the ethnic minority groups. These characteristics can be the results of the civil war, and still affecting slow recovery of the minority groups from the civil war. Among the ethnic minority groups, the relative deprivation of the Sri Lankan Tamil is clear from the data. Policy measures need to be instituted to compensate for the disadvantages experienced by minorities to promote rapid recovery and poverty reduction in the region.

1. Research Project Outline

The Survey of Conflict-Affected Regions in Sri Lanka was conducted as part of a joint research project on social reconstruction and poverty reduction after the civil war in Sri Lanka. Kobe University in Japan and the University of Peradeniya in Sri Lanka took part in the research. The main goal of this survey was to identify the effects of the civil war on a variety of outcomes such as income, employment, marriage, subjective well-being, health, education, social capital, social and political participation, and other types of behavioral changes. We pay special attention to outcomes such as education, health, and social trust, because of our concern regarding the long-lasting negative impacts of civil war. With our analysis of the long-term impact of civil war on households, we aim to illuminate the population groups in Sri Lanka who are left behind in the process of recovery from the civil war and provide policy implications for accelerating social reconstruction and further poverty reduction.

The research team consists of four members:

- Koji Yamazaki, Professor, Graduate School of International Cooperation Studies, Kobe University,
- Takahiro Ito, Associate Professor, Graduate School of International Cooperation Studies, Kobe University,
- Jia Li, Lecturer, Business School, Nanjing University of Information Science and Technology, and
- Ramila Usoof-Thowfeek, Senior Lecturer, Department of Psychology, Faculty of Arts, University of Peradeniya.

The household survey was conducted in collaboration with Kandy Consulting Group (Pvt.) Ltd. We acknowledge the useful suggestions and discussions at several stages of the research project with Mr. Dammika B. Herath, Head of Research, Kandy Consulting Group. In fact, we consider him to be the fifth member of our research team. We also acknowledge financial support from JSPS KAKENHI (Grant-in-Aid for Scientific Research) Grant Number 16KT0043. This research project was approved by Research Ethics Committee of Graduate School of International Cooperation Studies, Kobe University.

2. Implementation of Household Survey

We conducted a pilot survey in three Grama Niladari (GN) divisions[1] of the Trincomalee district in November 2017 to check and finalize the survey questionnaire (written in English). The questionnaire was then translated into the Tamil and Sinhalese languages by Kandy Consulting Group.[2] Using the translated questionnaires, we held a training session for enumerators and field supervisors from February 26 to March 1, 2018, at Kandy Consulting Group. After the training session, we dispatched enumerators into the field to conduct interviews. However, we were forced to stop the field interview process in early

[1] Sri Lanka is divided into nine provinces and each province is divided into a few districts. In total, there are 25 districts in Sri Lanka. Each district consists of several Divisional Secretariat (DS) divisions. These DS divisions are divided into Grama Niladari (GN) divisions, the lowest administrative unit in Sri Lanka.
[2] The survey questionnaires in English, Sinhalese, and Tamil are available online. See the appendix for details.

March owing to the ethnic riots involving radical Buddhists and Muslims and the subsequent curfew imposed by the government. Even though we were able to resume the field interviews soon after, we had to consider that the riots might have affected the answers to certain questions; those involving social trust toward different ethnic groups, for example. The field interview process was completed in May 2018.

We were aware that some of the questions related to their war experience may be traumatic for the respondents; therefore, we emphasized to enumerators that they should not pressure respondents to answer any question and that they should keep in mind that respondents have the option to refuse to answer any question or to end the interview at any time. Considering this, we recorded the participants' answers and assigned special numeric codes to different reasons for not answering a question (Table 1).

We attempted to match ethnicity of our enumerators to the respondents to minimize bias in answering questions based upon subjective perception, such as social trust. Moreover, we asked questions about subjective well-being (Section A1 in the questionnaire), social preferences and participation (Section A2), and views on peace and reconciliation (Section A3) before the war-related questions, as these last questions may bring to mind traumatic memories of the civil war for the respondent.[3] We also asked questions related to household members (Section A4) after Sections A1 to A3 to not evoke memories of deceased family members during the civil war when a respondent answers these sections.

3. Sampling Method

We aimed to sample representative households from eight districts in two provinces of Sri Lanka: the Northern and Eastern provinces. The Northern province consists of five districts: Jaffna, Mannar, Vavuniya, Mullaitivu, and Kilinochchi, while the Eastern province consists of three districts: Batticaloa, Ampara, and Trincomalee. Parts of these districts were under the control of the Liberation Tiger of Tamil Eelam (LTTE) during the civil war, and many violent events took place in these districts.

We used a multi-stage stratified clustered random sampling method. The strata were first defined by district (the first stratum). Then, to ensure that our sample contained diverse ethnic groups to accurately represent the population, we classified the 79 DS divisions into four categories, based on their ethnic group composition; these four categories were set as the second stratum. This method was implemented because GN divisions, as the primary sampling units, are often monoethnic, meaning that a simple random sampling may hinder our recovery of the actual ethnic composition. The total number of households interviewed was 1,600. Eight GN divisions were chosen within each district, and within each GN, 25 households were randomly selected. The sample size was designed to ensure a confidence level of 95% with a margin of error of 0.025 in the case of simple random sampling. The required sample

[3] We consider sections A8 on physical and mental difficulties, A12 on soldier experience, A13 on experiences during the Eelam War, and A14 on migration history after marriage to be distressing questions.

size was 1,537.[4]

The detailed sampling procedure follows two steps. First, based on tables of the Population by GN division and sex according to the Census of Population and Housing in 2012 (Census 2012), we classified DS divisions in each district, based on the ethnicity composition of the population. Specifically, DS divisions were classified into four categories: Tamil-, Sinhalese-, and Moor-dominant DS divisions and mixed ethnicity divisions. Dominant ethnic groups were defined as the group comprising at least 90% of the total population of a DS, based on Census 2012. We allocated eight GNs to each category (Table 2), roughly in proportion to population share of each ethnic group in a district, and randomly chose sample GNs from each category.

Second, we randomly selected 25 households to interview from each sampled GN. For this purpose, a voter's list in each sampled GN was collected by Kandy Consulting Group. We also obtained approval for conducting household surveys from each GN officer and provided all Divisional and District Secretaries with a formal written request to conduct the fieldwork. For GNs chosen from Tamil-, Sinhalese-, and Moor-dominant categories, we chose 25 households only from the dominant ethnic group. For GNs in the mixed category, we chose 25 households randomly, irrespective of their ethnicity.

4. Created Variables

4.1 Sampling Probability

For analytical purposes, we constructed certain variables and added them to the dataset. These constructed variables are contained in the data file for the cover page of the questionnaire (cover_v201.dta).

First, we constructed the sampling probability (*sampling_prob*) according to the sampling method explained in the previous section. As the number of households is constant across primary sampling units, the sampling probability differs from village to village. Thus, a user can recover the original population—which is based on Census 2012—using the sampling probability.

4.2 Household Size and Number of Adult-Equivalent Persons

The next created variable is the number of resident household members (*hhsize*), which is measured first by counting the number of persons listed in the household roster (Section A4) with individual IDs less than 20 (*a4_2id* < 20). We subtracted one if there was a deceased spouse among them. Next, we added the number of main income earners who are temporarily away from home ($21 \leq$ *a4_2id* ≤ 30) but stayed with a family for six months or more of the past 12 months ($6 \leq$ *a4_11* ≤ 12).

We also calculated the number of adult-equivalent persons (*ae*) by assigning a weight to each resident member of a household. The weights are taken from the work of Townsend (1994):

[4] $\left(1.96 * 0.5/_{0.025}\right)^2 = 1536.64$.

> "The educated guesses for age-sex weights are: for adult males, 1.0; for adult females, 0.9. For males and females aged 13-18, 0.94, and 0.83, respectively; for children aged 7-12, 0.67 regardless of gender; for children 4-6, 0.52; for toddlers 1-3, 0.32; and for infants 0.05." (footnote 12, p. 554)

4.3 Income Aggregates

From the answers to the questions in Sections A5 and A6, we constructed an aggregate annual income (*totalincome*) for each household[5]. Besides the common problem of underreporting of income by high-income households, we also found that some questions were rejected by respondents (given the code 888, Table 1). Thus, the reliability of income aggregates could be flawed. The total annual income of 554 households is missing owing to participants refusing to answer some questions related to earnings.

To determine the degree of underreporting, we estimated the poverty headcount ratio and the share of poor households in each district, and compared them with the official estimates. We used the district-specific poverty lines (*povline*) that are defined in terms of monthly per capita consumption expenditure, taken from Department of Census and Statistics (Table 4.2, p. 31, 2019). We then compared monthly household income per adult-equivalent person to the poverty line to define poor households. Next, we adjusted the estimates of the poverty headcount ratio and the share of poor households by sampling weights (i.e., an inverse of sampling probability given by the variable *sampling_prob*).

Table 3 shows our estimates in columns (1) and (2) and the official estimates of the shares of poor households in column (3). Our estimates of poverty, based on income aggregates of the survey data, are clearly much higher than the official estimates, except for Mullaitive and Kilinochchi, even though we used underestimates based on income per adult-equivalent person. We therefore doubt the reliability of our income aggregates and recommend instead the use of wealth index and wealth quintile, the calculation of which are explained below.

4.4 Asset Index and Asset Quintile

We followed the method of creating an asset index based on Demographic and Health Surveys and constructed an asset index for each household (Filmer and Pritchett 2001; Rutstein undated; Rutstein and Johnson 2004).

We used the number of resident household members along with the number of rooms per house, as answered in Section A9, to create the number of household members per sleeping room. From asset-related variables in Section A9, we then created continuous variables based on the size of land owned and the number of livestock owned, such as cattle, goats, pigs, chickens, and ducks. Binary variables were created for types of house ownership; having a separate kitchen; main material of roof; main

[5] In the calculation process, we also constructed two income aggregates: total self-employed income and remittances received (*totalself*) and total income from wages and salaries received (*totalwage*).

material of floor; main material of wall; source of drinking water; type of toilet; source of lighting; source of cooking fuel; ownership of durable goods such as refrigerator, TV, mobile phone, land-line phone, fan, computer, bicycle, motorbike, bus, camera, radio, AC, sewing machine, washing machine, rice cooker, three-wheeler, and car; ownership of fishery equipment such as non-motorized craft, motorized craft, and fishing nets; and ownership of farm tools and machinery, such as hand tools, plough, two-wheel tractor, four-wheel tractor, sprayers, threshers, and combined harvesting machine.

Using these variables, we conducted a principal component analysis and created a wealth index (*wealthscore*) from the first principal component. We also created a wealth quintile (*quintile*) by ranking individuals in our sample in terms of wealth index. Additionally we created a wealth index and a wealth quintile separately for urban and rural households.

5. Additional Notes About Data

5.1 Cover

In one GN (*gncode* = 65) in the Mannar district (*dcode* = 2), many households migrated to different areas; however, the GN officer stated that these families were coming back. Of the 25 households sampled in this cluster, we kept track of three households (*hhid* = 296, 297, and 298) who had temporarily moved away from the area; we conducted their interviews in Kalpitiya DS in the Puttalam district. Thus, their GPS coordinates[6] are recorded as the Puttalam district, not Mannar. Special care should be taken with the answers about locations among these households.

5.2 Section A8

There are two entries of the same person (*hhid* = 1448 and *a8_a3id* = 1) with the same kind of disability: difficulty in selfcare (*a8_a_type* = e). This is not an error or a duplication. These two entries represent two different disabilities in the same person, owing to incidents in two different years (2003 and 2018). The disability in 2003 was a broken leg because of an accident, while in 2018, the person broke his hand in another accident.

5.3 Section A13

Although the respondent confirmed that the answers given are correct, one person (*hhid* = 1184 and *a13_p1id* = 2) answered with numbers that seemed too high for some questions. Specifically,

- the number of friends/ neighbors still missing is 2,000 (*a13_1a_6_p1* = 2,000),
- the number of friends/ neighbors wounded or injured is 200 (*a13_1a_9_p1* = 200), and
- the number of friends/neighbors captured, kidnapped, or abducted is 100 (*a13_1a_12_p1* = 100).

We may decide to exclude this observation or replace these answers by “777” meaning “more than 10

[6] To protect the privacy of interviewed households, we do not disclose the GPS coordinates of each household.

persons."

6. Characteristics of Sample Households

6.1 Comparison with Census 2012

Table 4 shows the characteristics of individuals in the survey regions taken from Census 2012, as well as corresponding figures from our survey data. As these figures' dates are separated by six years, these numbers cannot be compared directly. However, the comparison provides an approximation of the representativeness of our sample as well as the changes in characteristics during the six-year period.

The main aim of our sampling was to obtain a representative sample in terms of the ethnic composition of the region. The comparison of shares of population by ethnicity shows that the ethnic shares of our survey sample are more or less similar to those of the Census. The same applies to the comparison of shares by religion. Although most of the Sinhalese people are Buddhists, the Sri Lankan Tamil are often either Hindu or Christian. This is why the share of "others" in the religion category is larger than its counterpart in ethnicity. Furthermore, we note that the share of Sinhalese in our sample is larger than the same population share in Census 2012. This may be because of the inflow of Sinhalese people to the north during the post-war period.

Considering the other figures in Table 4, we find that the sex ratio, i.e. the ratio of males to females, is higher and the share of children is lower in our survey data than in Census 2012. These differences can either be due to a sampling error, or to migration patterns and changes in fertility behavior in the region, or both. Lastly, we note that urban individuals seem to be under-sampled in our survey.

6.2 Other Characteristics

Table 5 shows additional characteristics of our sample. The average number of resident household members is 4.2 persons and the average age is 31.5 years. Among adult members, the average years of education is 8.9 years. These figures confirmed that Sri Lanka attained higher level of social development and went through transition to lower fertility and smaller household size.

Because our sample is representative of conflict-affected regions, we do find suggestive evidence of war victimization. Table 5 shows that the share of female heads of household is 18.5%, while the share of widows among ever-married women is 17.7%. These numbers[7] may indicate that the death rate during the war tended to be higher among adult males.

Table 5 also shows the main occupation of household heads. The share of those who work in the primary sector is relatively low, at 15.2%, and more than half of household heads are either casual workers (32.3%) or non-income earners (19.5%). The larger presence of casual workers and non-income

[7] For comparison, the share of female heads of household in India was 14.4% in 2006. This is the latest figure available for India from the online database, World Development Indicators of World Bank, available at: https://databank.worldbank.org/home. Access date is September 30, 2020.

earners in our survey can be a symptom of the mental and physical damages caused by the war.

In Table 6, we consider sub-categories of the main occupation of household heads across ethnic groups. There are obvious contrasts between the majority group of the Sinhalese and the minority groups of the Sri Lankan Tamil and the Moor. Most of the Sinhalese engage in primary-sector jobs or regular public-sector jobs. Conversely, more than half of the Sri Lankan Tamil or the Moor are either casual workers or non-income earners. Stark differences in heads of households' occupational category by ethnicity can be one of important factors hindering recovery from the war among ethnic minority groups.

6.3 Characteristics Across Ethnic Groups

Table 7 shows characteristics across ethnic groups. As there are only three households from other ethnic groups in our sample, we focus on three major ethnic groups. Sinhalese adults generally attained more years of education than the other groups, except for Moor male adults. Difference in years of education by sex is clear only among the Moor. When we compare the Sinhalese and the Sri Lankan Tamil, adults among the Sri Lankan Tamil attained fewer years of education by 0.2 to 0.4 years.

When considering the shares of female heads of households and widows, the shares are clearly higher among the Sri Lankan Tamil and the Moor. Lower levels of education and higher shares of female household heads and widows could be a manifestation of the war damages inflicted on people in the northern and eastern regions.

Table 8 shows the shares of ethnic groups in each wealth quintile. Clear ethnic composition patterns can be found. As we look at higher wealth quintile groups, the share of Sinhalese people increases; the share of the Sinhalese in the top wealth quintile is 35.9%, more than twice the population share. We also see a similar but more gradual increase in the share of the Moor among wealthier quintiles. For the Sri Lankan Tamil, an opposite pattern is found; their share declines as we look at higher wealth quintiles. Furthermore, the share of the Sri Lankan Tamil among the lowest wealth quintile is as high as 89.8%. Such wealth inequality across ethnic groups may become an obstacle to social integration and reconciliation as part of the process of war recovery in the region.

7. Concluding Remarks

This study presents an overview of the household survey, the Survey of Conflict-Affected Regions in Sri Lanka, conducted in 2018 as part of a joint research project on social reconstruction and poverty reduction after the civil war in Sri Lanka. We explained the sampling strategy and implementation of the household survey and discussed the merits and limitations of our survey data. We then provided a descriptive analysis of the survey data, from which several important findings emerge. More than half of household heads among the ethnic minority groups—the Sri Lankan Tamil and the Moor—are either casual workers or non-income earners. We also found lower levels of education and higher shares of female heads of household and widows among the ethnic minority groups. All these characteristics can

be resultant of the civil war, still affecting a slow recovery from the war among ethnic minority groups. Among the minority groups, the relative deprivation of the Sri Lankan Tamil is clear from the data. Strict policy measures are needed to address the disadvantages suffered by these people to promote rapid recovery and poverty reduction in the region.

With further analyses of the survey data, we hope to provide more useful insights to policy makers and researchers on how to accelerate recovery from the civil war and to promote social reconstruction and poverty reduction without leaving anyone behind.

8. References

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Appendix

The following documents are available online at:

https://sites.google.com/view/kojiyamazaki/sri-lanka-project

- Field Manual
- Codebook
- Questionnaire (English)
- Questionnaire (Tamil)
- Questionnaire (Sinhalese)

Data sets will be provided on the same web site when they are ready for public use.

Table 1: Unique Numeric Codes Assigned for All Unanswered Questions

Code	Meaning
888	Don't want to answer/Rejected
999	Don't know/Don't remember
99	Other (specify_____) with a specific answer given as another variable
-2	Valid blank (when specific instruction is given to skip a question)
996	Not relevant (when specific instruction is not given to skip a question)

Table 2: Number of Sampled GN divisions

Province	District	Total number of DS divisions	Total number of GN divisions	Number of GN divisions randomly chosen from each group of DS divisions				Total
				Tamil-dominant	Sinhalese-dominant	Moor-dominant	Mixed ethnicity	
Northern Province	Jaffna	15	435	8	0	0	0	8
	Mannar	5	153	1	0	0	7	8
	Vavuniya	4	102	6	1	0	1	8
	Mullaitivu	6	136	4	1	0	3	8
	Kilinochchi	4	95	8	0	0	0	8
Eastern Province	Batticaloa	14	346	3	0	2	3	8
	Ampara	20	503	1	3	2	2	8
	Trincomalee	11	230	1	1	1	5	8
		79	2,000	32	6	5	21	64

Table 3: Estimates of Poverty Headcount Ratio and Share of Poor Households

	(1)	(2)	(3)
	Headcount ratio (survey estimates)	Share of poor households (survey estimates)	Share of poor households (official estimates)
district\year	2018	2018	2016
Jaffna	22.3%	18.5%	6.0%
Mannar	18.6%	16.3%	0.9%
Vavuniya	26.8%	23.1%	1.5%
Mullaitivu	12.3%	10.5%	11.2%
Kilinochchi	16.4%	13.5%	15.0%
Batticaloa	23.4%	21.7%	8.1%
Ampara	22.7%	20.6%	2.1%
Trincomalee	13.2%	10.9%	6.8%

Source: The figures in columns (1) and (2) are estimated from our survey data with sampling weights. The figures in column (3) were taken from Table 4.1, p. 30, Department of Census and Statistics (2019).

Table 4: Comparison of Individual Characteristics between Census and Our Survey

	Census (2012)	Our survey (2018)
Sex ratio (Male/Female, %)	93.33	98.05
Share of children (age < 15, %)	28.90	24.79
Urban (% of individuals)	21.65	17.39
Ethnicity (% of individuals)		
Sinhalese	15.01	17.64
Sri Lankan Tamil	61.07	58.46
Moor	23.20	23.74
Other	0.72	0.17
Religion (% of individuals)		
Buddhist	14.80	17.18
Hindu	50.79	45.32
Islam	23.27	23.74
Other	11.14	13.76

Note: Figures for Census 2012 are calculated from data in Department of Census and Statistics (2015). Figures estimated from our survey data are adjusted using sampling weight

Table 5: Other Characteristics of Survey Samples

Average household size (persons)	4.21
Average age (years)	31.46
Average years of education (age ≥ 20)	8.90
Main occupation of household head (%)	
Primary sector	15.20
Non-farm self-employment	12.28
Regular worker	17.83
Casual worker	32.32
Non-income earner	19.54
Share of female heads of household (%)	18.45
Share of widows among ever-married women (%)	17.71

Note: Figures are adjusted using sampling weight

Table 6: Main Occupation of Household Head by Ethnic Group

	Primary sector	Non-farm self-employed	Regular worker		Casual worker	Non-income earner
			Public sector	Private sector		
Sinhalese	31.24	10.41	29.55	10.83	8.34	9.63
Sri Lankan Tamil	14.97	11.87	5.71	5.03	39.89	19.67
Moor	3.63	14.89	9.17	10.53	30.12	26.81

Note: Figures are percentage shares within each ethnic group, and adjusted using sampling weight.

Table 7: Characteristics across Ethnic Groups

	Years of education (age ≥ 20)		Share of female heads of households (%)	Share of widows among ever-married women (%)
	Male	Female		
Sinhalese	9.14	9.28	14.25	12.26
Sri Lankan Tamil	8.92	8.86	19.22	20.04
Moor	9.36	8.06	19.59	16.34

Note: Figures are adjusted using sampling weight.

Table 8: Share of Ethnic Groups within Each Wealth Quintile

Quintile	Sinhalese	Sri Lankan Tamil	Moor
1: Poorest	3.58	89.77	6.51
2: Poorer	0.94	85.64	13.23
3: Middle	18.04	60.49	21.47
4: Wealthier	29.91	37.48	32.11
5: Wealthiest	35.85	18.64	45.51

Note: Figures are adjusted using sampling weight.