Analysis and Results of a Bonded Labor Prevalence Survey in Tamil Nadu, a State of India

Paul Zador¹, Andee Cooper-Parks², Beth Ann Rabinovich¹ ¹Westat, 1600 Research Blvd, Rockville, MD 20850 ²International Justice Mission

Abstract

In India, and elsewhere, bonded labor is the most common type of modern slavery. This report describes the first survey-based study of the extent and characteristics of bonded labor in Tamil Nadu, a state of India. A stratified cluster sample of laborers in1,936 panchayat villages and 189 in town panchayats was drawn form 31 districts of Tamil Nadu (excluding Chennai). Between September and November, 2014, 66 local enumerators interviewed almost 9,000 laborers at or near their worksites in 11 different types of industries. Enumerators recorded the industry type and physical location of the site. Data collected from laborers included worksite size estimate, demographic information of laborers, and information on working conditions (e. g. freedom of movement, freedom of employment, amount of wages paid, and receipt of an advance). Magnitude and characteristics of the bonded labor population were estimated using SAS procedures for survey analysis. It was found that 29.9% (N = 463,000) of manual laborers working in the 11 industries surveyed were bonded. The level of bondage varied by type of industry, district, laborer demographics, and other factors.

Key Words: Bonded labor, India, survey, prevalence by industry

1. Background and Study Objectives

The Indian Constitution, as well as local laws, prohibit every form of slave labor. Unfortunately, these laws are not well enforced (Kara, 2014). Today, bonded labor is the most common form of slavery in India. Bonded labor is an arrangement whereby impoverished people are offered a loan in exchange for their indefinite commitment to continue working until the initial debt is paid off. The wages of bonded laborers are extremely low, often below even the abysmally low local minimum wage levels. By the nature of the situation, the debts typically remain unpaid for a long time forcing the laborer to remain a slave.

As further background to our study, we cite the relevant estimates for the worldwide magnitude of modern slavery by the International Labor Organization (ILO, 2012).

The ILO estimates that 20.9 million people are victims of forced labor globally, trapped in jobs into which they were coerced or deceived and which they cannot leave. Human trafficking can also be regarded as forced labor, and so this estimate captures the full realm of human trafficking for labor and sexual exploitation, or what some call "modern-day slavery".

The objective of this study was to estimate the extent and characteristics of bonded labor in Tamil Nadu. Tamil Nadu is a large and complex state in South India that covers 50,216 mi² (130,058 km²). In 2014, Tamil Nadu had a population of about 75.5 million. The state is divided into 32 administrative districts but this study excluded the Chennai district with an approximate 2014 population of about 5 million. Thus, the population total for the area covered by this study – the 31 districts of the state exclusive of Chennai – was approximately 70.5 million during the fall of 2014 data collection occurred. Throughout this report, unless stated otherwise, the terms 'Tamil Nadu' will be understood to include the qualifier 'exclusive of the Chennai district'.

This study was conducted in 2014-2015 by three organizations:

- International Justice Mission (IJM) developed the research questions, designed the data collection tools and procedures, as well as oversaw the data collection;
- National Adivasi Solidarity Council (NASC) teams collected the data; and
- Westat designed the sampling plan and analyzed the data.

Westat prepared a report for its funder, U. S. Department of State, the Office to Monitor and Combat Trafficking in Persons (Zador et al., 2015).

2. Data and Methods

About 70 variables were defined to code interviews [3] in terms of

- Location (GPS), date, interviewer
- Demographic data for subjects and their families
- Site information
- Information for defining bondage attributes
- Interviewer narratives (e.g., respondent truthfulness, level of violence at site)

Interview data were cleaned and coded by IJM; Westat generated a SAS-format analysis file and added variables for town and village counts by district and binary flags for types of bondage. For the purpose of this study, we then defined five types of bondage in terms of restrictions of the bonded laborer's freedom of movement (FoM), freedom of employment (FoM), and the presence of debt obligation and payment level:

- Bonded1: Freedom of Movement (FoM) restricted
- Bonded2: Freedom of Employment (FoE) restricted
- Bonded3: Both FoM and FoE (BL_Both)
- Bonded4: Either FoM or FoE is restricted (BL_FoM_FoE)
- Bonded5: Debt obligation & Not paid minimum wage

When we designed the study, IJM and NASC knew the types of industries that often employ bonded labor but data did not exist to identify specific areas where these industries had work sites. On using census data, it was possible to determine census data that Tamil Nadu is divided into 536 panchayat towns and 12,567 panchayat villages, and we also knew the locations of these geographical entities as well as town and village counts by district. In the absence of prior information on where bonded laborers are employed, and in order to assure a reasonably comprehensive coverage of Tamil Nadu by state, it was decided to sample panchayat villages and panchayat towns from every district. Specifically, 5 villages were selected by district at random and a total of 10 towns were selected from the whole state, also at random.

Sixty-six trained enumerators, divided into seven teams, travelled by car between the sample areas, and once in the villages or towns, by foot. Teams spent on average of seven days in each sample area (with 10 days spent in the larger urban areas). Upon entering each panchayat village or town, the enumerators developed local contacts with the Village Head -- the elected local representative --to identify the location of all worksites within the targeted industries. Over the course of the week, the team canvassed and surveyed all of the manual labor worksites within the known boundaries of the panchayat village or town, including a saturation of the geography off road as well as along the main roads.

Enumerators entered worksites, stated the research intentions to the superior present, and sought permission to interview workers. In a small number of worksites, enumerators were restricted entry, and therefore interviewed laborers immediately outside the physical boundaries of the site. Upon entry, the methodology called for enumerators to interview a maximum of six adult representatives of households who could speak on behalf of all their working family members. When approaching a laborer for an interview, enumerators completed a verbal informed consent before asking the survey questions. Given that it would be unsafe for both enumerators and laborers to state the purpose of the study as *measuring the prevalence of bonded labor*, it was instead accurately generalized to *understanding manual laborer's living and working conditions*.'

Villages and towns did not need to have any site employ bonded manual laborers in order to be retained in the sample. Similarly, work sites were retained as long as they belonged to one of the specified industry groups of interest (see Table 4).

Unfortunately, the number of workers employed a work-site, SS = site size, could not be obtained from any administrative source and it had to be obtained as part of the interview. Using individual SS estimates, laborer selection probability (p), and sampling weigh (wt.), were calculated as shown:

- p1 = work-site selection probability
- p2 = within-site laborer selection probability
 - (Interview count / laborer's site size (SS) estimate)
- p = p1 x p2, laborer selection probability
- wt = sampling weight = 1/p

For the 26 respondents who did not provide and SS estimate, SS was imputed by the average value of SS estimates by respondents interviewed at work sites of the same industry group.

Table 1 shows selected statistics for Tamil Nadu and by panchayat type. The laborer sample included 2,125 work sites, 1,936 in villages and 189 in towns. On average, there were 4.22 work sites per sampled geographic area, 4.16 per village and 4.87 per town. The number of work sites varied between 1 and 13 in villages and between 1 and 22 in towns. District included an average of 17.3 towns and an average of 405.4 villages. The actual panchayat counts varied greatly among districts, between 2 and 56 for towns and between 35 and 1,104 for villages.

| | | Area Type | | | | | |
|------|----------|-----------|-------|------------|--|--|--|
| Unit | Variable | Villages | Towns | Tamil Nadu | | | |
| | Minimum | 35 | 2 | 2 | | | |
| | Average | 405.4 | 17.3 | 423.6 | | | |
| | Maximum | 1104 | 56 | 1156 | | | |
| Site | Ν | 1936 | 189 | 2125 | | | |
| | Minimum | 1 | 1 | 1 | | | |
| | Average | 4.16 | 4.87 | 4.22 | | | |
| | Maximum | 13 | 22 | 22 | | | |

Table 1:Statistics for Tamil Nadu Panchayats per District and Laborer Interviews per Site and
by Area Type

We note that because of the variability in the sampling rates of villages and towns as well as in site size estimates -- both within and across sites -- respondent weights were also highly variable. Weight variability resulted in wide confidence intervals for most estimates despite the large sample size of this study.

Both the village and the town samples were drawn as stratified cluster samples. For the village sample, districts formed the strata, panchayat villages the clusters, and 5 villages were drawn at random without replacement from every district. The town sample had a single cluster, Tamil Nadu State, towns formed the clusters, and 10 towns were sampled also without replacement.

The SAS procedures (SAS Institute, 2015) Surveymeans and Surveylogist were used to perform the statistical analyses. These procedures incorporated options to account for study design and sampling weighs in the calculations of means, percentages, regression relations and various related statistics such as confidence intervals or r-squares

3. Results

3.1 Estimates for the Number of Bonded Manual Laborers and Bondage Prevalence in Tamil Nadu

In Tamil Nadu, a total of 8,973 interviews were conducted with manual laborers employed by the industries included in the study (Table 2). (Interviews conducted with people who were not manual laborers were excluded from all analyses). Among these, a total of 1,513 reported at least one earning *or* movement restriction (Bonded4), 375 at least one earning *and* one movement restriction (Bonded3), 1,020 one or more movement restrictions (Bonded1), and 868 one or more earning restrictions (Bonded2).

Based on weights derived using the laborer's own work site size estimates, the comparable estimate (Table 3) for the number of manual laborers in Tamil Nadu was 1,547,300 (1,251,700 - 1,843,000). Among these, 463,000 or 29.9% (23.4% - 34.4%) had at least one earning or movement restriction (Table 4, Bonded4). For the three other types of bondage, Bonded1-Bonded3, the comparable estimates for the number (percent) of manual laborers were, respectively, 240,900 (14.8%), 351,400 (16.8%), and 129,200 (7.3%).

Based on publicly available data, the 2014 population of Tamil Nadu over the age of 14 was about 45 million (about 72% of the population of 70 million). The youngest respondent in the survey was 16 years old. Combining these data with the estimate in Table 2, we

estimated that about 1% of the working age population in Tamil Nadu was subject to at least one earning or movement restriction at the time of the survey.

Table 2:Counts of Interviewed Manual Laborers, All and by Type of Debt-Bondage, in 11Industry Groups in Tamil Nadu (Exclusive of Chennai) and by Type of Area

| | Area Type | | | | | | |
|----------|------------|-------|----------|--|--|--|--|
| Laborers | Tamil Nadu | Towns | Villages | | | | |
| All | 8973 | 921 | 8052 | | | | |
| Bonded1 | 1223 | 203 | 1020 | | | | |
| Bonded2 | 1144 | 276 | 868 | | | | |
| Bonded3 | 511 | 136 | 375 | | | | |
| Bonded4 | 1856 | 343 | 1513 | | | | |

Table 3:Weighted Counts (N, in 000's) of Manual Laborers and 95% Confidence Limits
(N_Low and N_High) for All Laborers and by Type of Debt-Bondage in 11 Industry
Groups in Tamil Nadu (Exclusive of Chennai) and by Type of Area

| | | Area | | | | | | | | |
|----------|-------|-------|--------|--------|---------|--------|--------|------------|--------|--|
| | | Town | | | Village | | | Tamil Nadu | | |
| Laborers | Ν | N_Low | N_High | Ν | N_Low | N_High | Ν | N_Low | N_High | |
| All | 254.9 | 23.2 | 486.5 | 1292.5 | 1108.8 | 1476.3 | 1547.4 | 1251.7 | 1843.1 | |
| Bonded1 | 49.1 | -3.5 | 101.6 | 191.8 | 134.6 | 248.9 | 240.9 | 163.2 | 318.5 | |
| Bonded2 | 134.2 | -9.0 | 277.4 | 217.1 | 143.9 | 290.3 | 351.4 | 190.5 | 512.2 | |
| Bonded3 | 35.0 | 12.7 | 82.7 | 94.2 | 48.9 | 139.5 | 129.2 | 63.4 | 195.0 | |
| Bonded4 | 148.3 | -2.2 | 298.8 | 314.7 | 226.5 | 402.9 | 463.0 | 288.5 | 637.4 | |

Table 4:Percent (P) of Debt-Bonded Manual Laborers (by Type of Debt-Bondage) Among
All Manual Laborers and 95% Confidence Limits (P_Low and P_High) in 11 Industry
Groups in Tamil Nadu (Exclusive of Chennai) and by Type of Area

| | | Area Type | | | | | | | |
|----------|------------|-----------|--------|-------|-------|--------|----------|-------|--------|
| | Tamil Nadu | | | Towns | | | Villages | | |
| Laborers | р | p_Low | p_High | р | p_Low | p_High | р | p_Low | N_High |
| Bonded1 | 15.6 | 12.4 | 18.7 | 19.3 | 11.4 | 27.1 | 14.8 | 11.5 | 18.2 |
| Bonded2 | 22.7 | 16.0 | 29.4 | 52.7 | 43.1 | 62.3 | 16.8 | 12.6 | 21.0 |
| Bonded3 | 8.4 | 5.1 | 11.6 | 13.7 | 3.9 | 23.6 | 7.3 | 4.2 | 10.4 |
| Bonded4 | 29.9 | 23.4 | 36.4 | 58.2 | 49.4 | 66.9 | 24.4 | 19.6 | 29.1 |

3.2 Estimates for the number and proportion of the bonded among manual laborers in Tamil Nadu by Industry Group

Table 5 presents weighted count estimates of manual laborer by industry group and type of bondage. The comparable tables 6a (6b) present estimates of prevalence (and 95% prevalence confidence limits). Table 7 presents survey sample sizes by industry group and type of bondage.

The top four industry groups that employed manual laborers were, in descending order by the number of manual laborers, Regular Farming (555,500), Textiles (384,200), Plantation (233,400), and Brick Kilns (111,700).

The top four employers of manual laborers with at least one restriction on their earning or movement (Bonded4) were, in descending order by bonded laborer count, Textiles (237,900), Brick Kilns (71,200)., Regular Farming (50,300) and Plantation (38,900).

The top four industry groups with the highest prevalence of earning or movement restrictions on their employees were, in descending order, Brick Kilns (63.7%), Textiles (61.9%), Rock Quarries (59.2%), and Rice Mills (32.2%). Only two industry groups had earning or movement restriction prevalence under 10%: Sugarcane Farms (7.7%) and Regular Farming (9.1%).

Remarkably, despite the size (Table 7) of some of the industry samples and the resulting wide 95% confidence limits of Bonded4 prevalence, none of them included 0% proving that **all 11 industry groups included in this study employed at least some bonded labor.** For other types of bondage, some confidence limits do include 0% in cases when both sample size and bondage rate estimates are low.

| | Laborers | | | | | | | |
|-----------------|----------|-----------------------------|-------|------|-------|--|--|--|
| | All | All Bonded1 Bonded2 Bonded3 | | | | | | |
| Industry Group | Ν | Ν | Ν | Ν | Ν | | | |
| Regular Farming | 555.5 | 34.1 | 21.0 | 4.8 | 50.3 | | | |
| Plantation | 233.4 | 23.2 | 28.7 | 13.0 | 38.9 | | | |
| Sugarcane Farms | 69.3 | 4.8 | 2.5 | 1.9 | 5.4 | | | |
| Flower Garden | 35.3 | 4.7 | 2.5 | 1.0 | 6.2 | | | |
| Brick Kiln | 111.7 | 61.4 | 51.1 | 41.3 | 71.2 | | | |
| Rock Quarry | 30.5 | 15.4 | 12.1 | 9.4 | 18.1 | | | |
| Textiles | 384.2 | 71.4 | 216.3 | 49.7 | 237.9 | | | |
| Fish Farms | 39.6 | 7.7 | 3.4 | 2.2 | 8.8 | | | |
| Rice Mil | 22.6 | 4.9 | 4.0 | 1.6 | 7.3 | | | |
| Match and | 11.2 | 2.2 | 2.0 | 1.2 | 2.0 | | | |
| Fireworks | 11.5 | 2.5 | 2.0 | 1.2 | 5.0 | | | |
| Tree Cutting | 54.1 | 11.1 | 7.9 | 3.1 | 16.0 | | | |

Table 5:Weighted Counts (N, in 000's) of Manual Laborers in Tamil Nadu by Industry Group
and Type of Bondage

| Table 6a: | Weighted Percent of All Manual Laborers in Tamil Nadu (Exclusive of Chennai) by |
|-----------|---|
| | Type of Debt-Bondage and Industry Group |

| | Laborers | | | | | | | | |
|-----------------|----------|---------|---------|---------|--|--|--|--|--|
| Industry Group | Bonded1 | Bonded2 | Bonded3 | Bonded4 | | | | | |
| Regular Farming | 6.1 | 3.8 | 0.9 | 9.1 | | | | | |
| Plantation | 9.9 | 12.3 | 5.6 | 16.6 | | | | | |
| Sugarcane Farms | 6.9 | 3.6 | 2.8 | 7.7 | | | | | |
| Flower Garden | 13.3 | 7.0 | 2.8 | 17.5 | | | | | |
| Brick Kiln | 55.0 | 45.8 | 37.0 | 63.7 | | | | | |
| Rock Quarry | 50.3 | 39.6 | 30.7 | 59.2 | | | | | |
| Textiles | 18.6 | 56.3 | 12.9 | 61.9 | | | | | |
| Fish Farms | 19.4 | 8.5 | 5.6 | 22.3 | | | | | |
| Rice Mil | 21.6 | 17.6 | 7.1 | 32.2 | | | | | |
| Match and | 20.1 | 17.6 | 10.0 | 26.8 | | | | | |
| Fireworks | 20.1 | 17.0 | 10.9 | 20.8 | | | | | |
| Tree Cutting | 20.6 | 14.6 | 5.7 | 29.5 | | | | | |

| | Laborers | | | | | | | |
|-----------------|----------|--------|---------|--------|---------|--------|---------|--------|
| | Bon | ded1 | Bonded2 | | Bonded3 | | Bonded4 | |
| Industry Group | P_Low | P_High | P_Low | P_High | P_Low | P_High | P_Low | P_High |
| Regular Farming | 3.1 | 9.1 | 2.6 | 5.0 | 0.2 | 1.5 | 5.9 | 12.2 |
| Plantation | 4.8 | 15.1 | 7.0 | 17.6 | 1.3 | 9.9 | 10.7 | 22.6 |
| Sugarcane Farms | 0.7 | 13.0 | -0.0 | 7.3 | -0.1 | 5.7 | 1.1 | 14.4 |
| Flower Garden | 3.8 | 22.8 | 3.7 | 10.4 | -0.5 | 6.0 | 8.5 | 26.6 |
| Brick Kiln | 46.3 | 63.7 | 32.5 | 59.1 | 22.1 | 52.0 | 55.5 | 72.0 |
| Rock Quarry | 33.3 | 67.4 | 10.8 | 68.4 | 5.9 | 55.6 | 39.1 | 79.3 |
| Textiles | 10.2 | 27.0 | 47.7 | 64.9 | 4.5 | 21.4 | 53.5 | 70.4 |
| Fish Farms | -0.9 | 39.7 | 1.6 | 15.4 | -1.3 | 12.5 | 2.3 | 42.4 |
| Rice Mil | 7.4 | 35.7 | -0.8 | 36.0 | -0.9 | 15.1 | 10.0 | 54.3 |
| Match and | -0.9 | 41.2 | -3.7 | 38.8 | -5.1 | 26.9 | 2.2 | 51.4 |
| Fireworks | | | | | | | | |
| Tree Cutting | 9.6 | 31.6 | 6.4 | 22.8 | 1.3 | 10.1 | 18.0 | 41.1 |

Table 6b:Upper and Lower 95% Confidence Limits P_Low, P_High) for Weighted Percent's
of Manual Laborers in Tamil Nadu by Type of Debt-Bondage and Industry Group

| Table 7: | Survey Sample Sizes of All Manual Laborers in Tamil Nadu by Type of Debt- |
|----------|---|
| | Bondage and Industry Group |

| Obs | Industry Group | All | Bonded1 | Bonded2 | Bonded3 | Bonded4 |
|-----|-----------------|------|---------|---------|---------|---------|
| 1 | Regular Farming | 3803 | 232 | 136 | 32 | 336 |
| 2 | Plantation | 2093 | 227 | 173 | 73 | 327 |
| 3 | Sugarcane Farms | 368 | 25 | 13 | 10 | 28 |
| 4 | Flower Garden | 308 | 27 | 18 | 5 | 40 |
| 5 | Brick Kiln | 549 | 285 | 220 | 184 | 321 |
| 6 | Rock Quarry | 172 | 76 | 60 | 46 | 90 |
| 7 | Textiles | 813 | 155 | 413 | 100 | 468 |
| 8 | Fish Farms | 257 | 48 | 17 | 11 | 54 |
| 9 | Rice Mil | 167 | 38 | 23 | 9 | 52 |
| 10 | Match and | 63 | 13 | 8 | 3 | 18 |
| | Fireworks | | | | | |
| 11 | Tree Cutting | 380 | 97 | 63 | 38 | 122 |

3.3 Estimates for the number and proportion of the bonded among manual laborers in Tamil Nadu demographic characteristics

Gender. Tables 8a and 8b respectively present weighted count and prevalence estimates for males and females by type of bondage. There were more female (872,800) than male (674,600) manual laborers in Tamil Nadu, but the percentage and number of bonded males (Bonded4: 246,400, 36.5%) exceeded the comparable estimates for females (216,600, 24.8%).

Table 8a:Weighted Counts (N, in 000's) of All Manual Laborers in Tamil Nadu by Gender and
Type of Debt-Bondage

| | Laborers | | | | | | |
|--------|----------|---------|---------|---------|---------|--|--|
| | All | Bonded1 | Bonded2 | Bonded3 | Bonded4 | | |
| Gender | Ν | Ν | Ν | Ν | Ν | | |
| Male | 674.6 | 161.9 | 185.0 | 100.5 | 246.4 | | |
| Female | 872.8 | 78.9 | 166.4 | 28.8 | 216.6 | | |

| | Laborers | | | | | | |
|--------|----------|------------------------------|------|------|--|--|--|
| | Bonded1 | Bonded1 Bonded2 Bonded3 Bond | | | | | |
| Gender | Р | Р | Р | Р | | | |
| Male | 24.0 | 27.4 | 14.9 | 36.5 | | | |
| Female | 9.0 | 19.1 | 3.3 | 24.8 | | | |

Table 8b:Weighted Percent's of All Manual Laborers in Tamil Nadu by Gender and Type of
Debt-Bondage

Age group. Tables 9a and 9b present weighted count and prevalence estimates for three age groups by type of bondage. The weighted counts of all manual laborers in the three age groups were, in sequence by increasing age, respectively, 513,200, 644,500, and 389,800. The comparable count (prevalence) estimates for Bonded4 manual laborers were 237,800 (46.3%), 147,600 (22.9%) and 77,500 (19.9%). It is noteworthy that prevalence estimates for the three age groups decline over age and the Bonded4 confidence intervals of the youngest and oldest age groups do not overlap (not shown). In fact, bondage was more than twice as common among laborers under 30 as among laborers over 45.

Table 9a:Weighted Counts (N, in 000's) of All Manual Laborers in Tamil Nadu by Age Group
and Type of Debt-Bondage

| | Laborers | | | | |
|-----------|----------|---------|---------|---------|---------|
| | All | Bonded1 | Bonded2 | Bonded3 | Bonded4 |
| Age Group | Ν | Ν | Ν | Ν | Ν |
| -30 | 513.3 | 97.6 | 200.6 | 60.4 | 237.8 |
| 31-45 | 644.5 | 88.4 | 104.8 | 45.5 | 147.6 |
| 45- | 389.8 | 54.8 | 46.0 | 23.3 | 77.5 |

Table 9b:Weighted Percent of All Manual Laborers in Tamil Nadu by Age Group and Type of
Debt-Bondage

| | Laborers | | | | |
|-----------|----------|---------|---------|---------|--|
| Age Group | Bonded1 | Bonded2 | Bonded3 | Bonded4 | |
| -30 | 19.0 | 39.1 | 11.8 | 46.3 | |
| 31-45 | 13.7 | 16.3 | 7.1 | 22.9 | |
| 45- | 14.1 | 11.8 | 6.0 | 19.9 | |

Panchayat type. Tables 10a and 10b present weighted count and prevalence estimates for towns and villages by type of bondage. There were, respectively, 254,900 and 1,292,500 manual laborers in towns and villages. The weighted count and prevalence estimates for Bonded4 were 148,300 and 58.2% for towns and 314,700 and 24.3% for villages. The prevalence of bonded labour was more than twice as high in towns than in villages.

Table 10a:Weighted Counts (N, in 000's) of All Manual Laborers in Tamil Nadu by Type of
Debt-Bondage and Area Type

| | Laborers | | | | |
|-----------|----------|---------|---------|---------|---------|
| | All | Bonded1 | Bonded2 | Bonded3 | Bonded4 |
| Area Type | Ν | Ν | Ν | Ν | Ν |
| Towns | 254.9 | 49.1 | 134.2 | 35.0 | 148.3 |
| Villages | 1292.5 | 191.8 | 217.1 | 94.2 | 314.7 |

| | Laborers | | | | |
|-----------|-------------------------|------|------|---------|--|
| | Bonded1 Bonded2 Bonded3 | | | Bonded4 | |
| Area Type | Р | Р | Р | Р | |
| Towns | 19.2 | 52.7 | 13.7 | 58.2 | |
| Villages | 14.8 | 16.8 | 7.3 | 24.3 | |

Table 10b:Weighted Percent's of Manual Laborers in Tamil by Type of Debt-Bondage and Area
Type

Regression model for Bonded4 rate. The SAS Surveylogist procedure was used to model Bonded4 probability in terms Panchayat-type, age, sex, industry-type, and the 2-way interactions of these factors. All 4 predictors, as well as their 2-way interactions, proved to be statistically significant. The logistic regression model worked reasonably well for Tamil Nadu as a whole: the Bonded4 probability estimate was within 3.5% of the observed rate for the state. However, at lower aggregation levels, estimation errors were larger: they varied between -22.3% and 6.4% Among other findings, the results also confirmed that regardless of age, males had a higher probability of Bonded4 than females and, regardless of sex, that probability decreased with age.

Other results. Additional results included the following:

- Being Bonded4 increased the chance of receiving below minimum wage from 28% to 61% and having received an advance from 2% to 34%
- Working outside one's home district increased the rate of Bonded4 from 17% to 65%
- IJM conducted special programs for several years to reduce/eliminate bondage in Tamil Nadu's four special districts. This survey found that Bonded4 was lower in the special districts than elsewhere. However, this research was unable to attribute the observed special district advantage to the special programs.

Data validation

- Enumerator's 'gut feelings' matched criteria-based assignment of bondage-level (Bonded1-Bonded4) 90% of the time
- IJM/NASC re-surveyed some randomly chosen Panchayats in every district at a second, later time.

It was found that between-survey season change influenced labor force and resulted in work-site closures. These changes made matching results between the two surveys and the comparison of the new results to the original work site estimates impossible to interpret.

Data-collection reproducibility

- 15 enumerators were tested at up to 3 'fake work sites' using 35 survey items per trial. 43 of 45 response sets were complete
- Correct response rates varied by item across the sets between 60% and 97.4% with a mean of 84.8%
- Among the 43 complete response sets, correct response counts varied between 25 and 43 with an average of 36.5

The comparisons between the known and recorded responses showed that NASC enumerators were able to reliably reproduce respondent data most of the time.

4. Challenges and Limitations

- Sample design challenges and limitations:
 - There was no prior information about:
 - Geographic data for labor sites of interest
 - Panchayat-level demographic data
 - Administrative site-size data
 - Laborers from the same site often disagreed about site size
 - Owners/supervisors often interfered with interviewers
- Issues not explored:
 - Laborer's recruitment process into slavery:
 - Laborer's pre-bondage occupation
 - o Trigger event that forced laborer into debt bondage
 - o Recruiter's identity
 - Time of laborer's first bondage at the site or at any other site
 - Child labor

5. Summary, Conclusions and Suggestions for Future Research

Based on the surveys of about 9,000 laborers from over 2,100 labor sites located at 153 Panchayat towns and villages in Tamil Nadu's 31 districts, we estimated that:

- 460,000 (30%) among the 1.5 million laborers working in industries similar to those in this survey were bonded
- About 1% of the working age population of Tamil Nadu was bonded
- Males were bonded more often than females, and younger laborers more often than older laborers
- Bondage was more common in towns than in villages
- Among the 11 industry groups investigated, textile-related work employed the largest number of bonded laborers (N = 238,000)
- Bonded-labor prevalence varied by industry group between 8% in sugar-cane farms and 64% in brick kilns
- Manual laborers from outside the district where the work site was located were bonded more often than manual laborers from the same district.
- In every industry group, bonded manual laborers were paid under the minimum wage and had debt obligation more often than the other laborers.

The main conclusions of this study include:

- Despite it being constitutionally prohibited in India, the employment of bonded labor was still common throughout Tamil Nadu during 2014.
- Bondage is a complex phenomenon. Both the absolute and the relative frequencies of bonded labor vary by industry type and worksite location in terms of district and panchayat type, as well as by laborer demographics.

 Methods employed in this study were able to provide detailed information about bonded labor: a contemporary form of slave labor.

Future surveys designed to estimate bonded labor prevalence with a view to help reduce and eliminate it should consider the inclusion of questions related to

- The process of enslavement into debt bondage and the identification of "bad actors" who facilitate it.
- Identifying local authorities specifically responsible for enforcing anti-slavery laws and regulations and NGOs known to be concerned with slave labor.
- Documenting the understanding by bonded laborers of their rights, methods available to freeing themselves and their families, and the local availability of government agencies and/or NGOs that are ready to help them.
- Improving the design and analysis of bonded-laborer surveys primarily by gaining systematic access to comprehensive information about work sites that are known, or suspected, to employ bonded labor.
- Obtaining relevant employment and demographic data by industry classification at the lowest geographic level for which it is available.
- Obtaining information about the buyers of products produced by bonded manual laborers with special focus on international corporations and/or their local representatives.
- Investigating child labor.

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