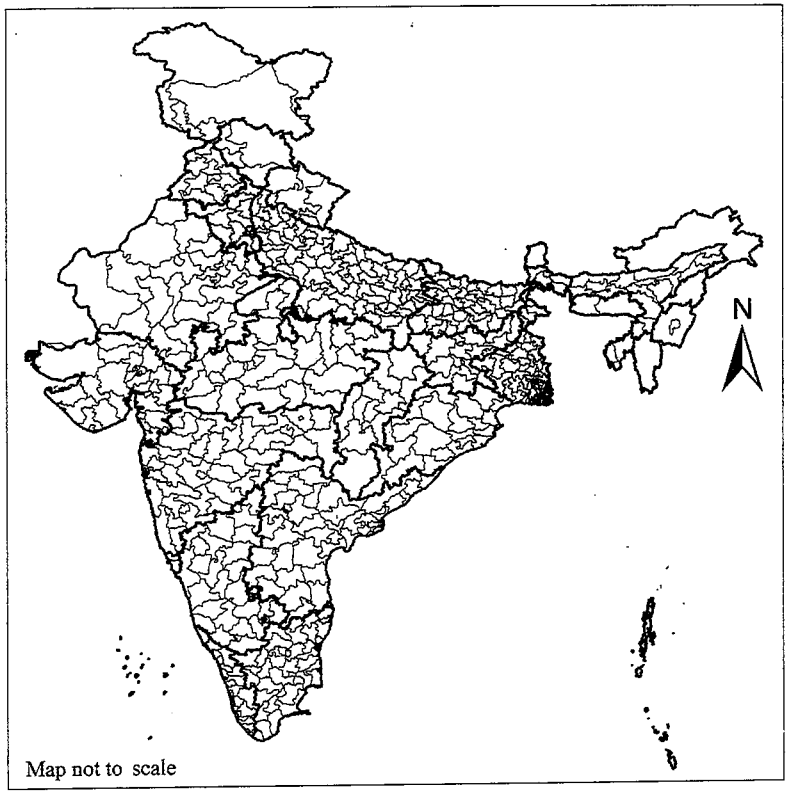

Electoral Map of India (Fourth Delimitation, 2008)
Source: Delimitation Commission of India (2002–8).

Fixing Electoral Boundaries in India

Laws, Processes, Outcomes, and Implications for Political Representation

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read: 'Wards have to be delimited based on factors such as population, area, revenue etc.' (Karthikeyan 2012). In brief, wards were to remain unequal in terms of population.

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The central thought behind the idea of local governments has been to deepen democracy, to give more power to people in deciding matters that affect their everyday life. But despite the fact that local governments too are constitutional bodies and integral to the democratic system, they remain as a separate entity. Not only do they remain unaligned with the upper tiers of democracy, there are also different structures and rules for delimiting electoral divisions within them. While the principle of equality in franchise is the primary criterion in drawing electoral boundaries for upper tiers, the same hardly applies to delimitation of electoral boundaries for the third tier of democracy. As a result, the size of electorate across wards varies a great deal, leading to under/over enfranchisement. To put it a little differently, it is a gross violation of the notion of 'one person–one vote–one value'.

This problem will remain as long as the third tier of democracy is regarded as the exclusive domain of the state governments to legislate over or use discretionary powers in shaping the structures and functioning of the local governments. It would not only be ideal but also of greater benefit to democracy if the electoral boundaries of different tiers of democratic governance map onto each other, and the principle of equality in franchise is maintained in all of them. To conclude, the aspect of how to divide territories for local governments calls for the urgent attention of scholars and other stakeholders; and it requires meticulous thoughts as well as innovative approaches. The sooner the problem is overcome, the better it is for the health of democracy.

11

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Socio-economic Profiles for India's Old Electoral Constituencies, 1971 and 2001

Do India's politicians influence the development patterns of their constituencies? Has the Indian National Congress (INC) worked more for the lower castes than have other parties? Has the Bharatiya Janata Party (BJP) helped industry when they have been in power? These are the kinds of questions many of us would like to know the answers to. Yet, it is hard to find answers to such questions, because of the lack of socio-economic data for electoral constituencies in India. The Indian state (as pointed out in Chapter 12) collects massive amounts of information about villages, blocks, districts, states, and the country as a whole. Electoral constituencies have different boundaries from each of these administrative units, but no socio-economic data are collected for these geographical units. Because of this discrepancy in boundaries, it is difficult to use the wealth of data at the administrative level to ask how India's politics has been influenced by, and has influenced, the country's socio-economic outcomes. The absence of data for the country's political units is unfortunate for *politicians*, who do not have accurate information about their constituencies; for *voters*, who are impeded in their efforts to hold politicians to account; and for *researchers*, whose

efforts to study the relationships between politics and socio-economic processes and outcomes are thwarted.

In this chapter, we help remedy this gap by presenting socio-economic profiles for India's state assembly constituencies using census data for 1971 and 2001. India's state assembly constituency boundaries were drawn by the third Delimitation Commission (DC) of India in 1976 on the basis of the 1971 Census data, and these boundaries remained frozen until 2008, due to the 42nd Constitutional Amendment. The socio-economic profiles we create using 1971 Census data capture how electoral constituencies appeared when they were first drawn, while the 2001 Census data allow us to describe how constituencies looked just before they were redrawn in 2008.

We start by briefly explaining how political boundaries in India are drawn and what prevents us from using existing data to describe them and trace their evolution over time. We then explain, in some detail, how we went about constructing the socio-economic profiles, by merging political and census data for 1971, using archival data, and for 2001, using geographic information system (GIS) software. We discuss some of the advantages and disadvantages of using differing methods for the 1971 and 2001 data. In the final section, we present socio-economic profiles of Indian state assembly constituencies in 1971 and 2001. We describe the country's assembly constituencies at these two points of time, and highlight prominent changes in constituencies over time. We conclude with a promise and two pleas: our promise is to make the data presented here public;[1] and our pleas are to other scholars to do the same with their social science data sets, and to the government, to add indicators in the village- and ward-level data that they collect to enable the aggregation of micro-data of political constituencies.

Studying Indian Constituencies: The Problem of Different Boundaries

India is divided into states and administrative districts. Within each district, there are blocks, variously called *tehsils*, talukas, mandals, *firkas*, police stations, or development blocks. Large amounts of data are collected for these administrative units, by the various ministeries and agencies of the

[1] The data are available at www.rikhilbhavnani.com and www.francesca.no

Government of India and Indian states, as well as by the private sector. The Census of India reports some demographic information down to the village level, and many large-scale surveys (like the National Sample Survey) report socio-economic data down to the district level.

India is a federal democracy, and the country's 29 states are divided into single-member electoral constituencies, wherein Members of Parliament (MPs) and Members of Legislative Assemblies (MLAs) are elected to the national and state legislatures, respectively, using simple plurality elections. These electoral boundaries are different from the administrative boundaries described earlier.

Delimitation Commissions (DCs), periodically constituted by the Government of India in keeping with the country's Constitution, draw political boundaries. As in many countries, the DC is independent of the government, to avoid the ruling government manipulating the boundaries to do well in the next election (also see Chapter 3). The DC commences its task of drawing out political boundaries by examining detailed census data, and boundaries are drawn so as to ensure that constituencies are contiguous and have approximately equal populations. Efforts are also made to avoid having a mountain or a river dividing the constituency, because this would make it hard for politicians to visit their constituents regularly.

Seats for the state legislative assemblies are apportioned to districts in a manner that is directly proportional to their population shares in each state. State assembly constituencies are then drawn to fit inside each district (see Bhavnani 2014a and Jensenius 2013a for more details about how the delimitations are conducted). On average, there are about 10 state assembly constituencies in a district across India. In hilly states, such as Himachal Pradesh, each of the assembly constituencies had a population of approximately 50,000 people according to the 1976 delimitation, while in India's largest state, Uttar Pradesh, there were about 200,000 people in each constituency. Parliamentary constituencies are made up of several state assembly constituencies, and on average, there are about seven state assembly constituencies in a parliamentary constituency. State assembly constituency boundaries therefore never cross district boundaries, while parliamentary constituency boundaries may cross district boundaries. Table 11.1 shows the number of districts, parliamentary constituencies, and state assembly constituencies in India's 15 largest states, according to the 1976 delimitation report.

TABLE 11.1 Distribution of Parliamentary Constituencies (PCs) and State Assembly Constituencies (ACs) in Major States (1976)

State	Number of Districts	Parliamentary Constituencies	Assembly Constituencies	ACs per District	ACs per PC
Andhra Pradesh	21	42	294	14.0	7
Bihar	31	54	324	10.5	6
Gujarat	18	26	182	10.1	7
Haryana	11	10	90	8.2	9
Himachal Pradesh	12	4	68	5.7	17
Karnataka	19	28	224	11.8	8
Kerala	11	20	140	12.7	7
Madhya Pradesh	45	40	320	7.1	8
Maharashtra	26	48	288	11.1	6
Odisha	13	21	147	11.3	7
Punjab	10	13	117	11.7	9
Rajasthan	26	25	200	7.7	8
Tamil Nadu	15	39	234	15.6	6
Uttar Pradesh	53	85	419	7.9	4.9
West Bengal	16	42	294	18.4	7

Source: Calculated by authors.

In Figure 11.1, we show an example of how administrative block boundaries differ from state assembly constituency boundaries in the state of Rajasthan. The top panel in the figure shows block-level boundaries within each of the districts in Rajasthan, while the bottom panel shows constituency boundaries within each of the same districts. In the left-most districts of the state, one can see that there are three blocks, but only two constituencies.

At the time of Independence, it was decided that a new delimitation should be conducted following every decennial census, in order for all constituencies to have the same population size. Consequently, DCs were formed in 1952, 1963, and 1972. Since the population size of all political constituencies originally was supposed to be the same, and the birth rates differed dramatically across Indian states, this, over time, led to an increase in the political representation in areas with high birth rates. Increasing the representation in areas with a high birth rate in this way was seen as a perverse incentive to the family planning programmes that were one of the primary focus areas for the Indian government in

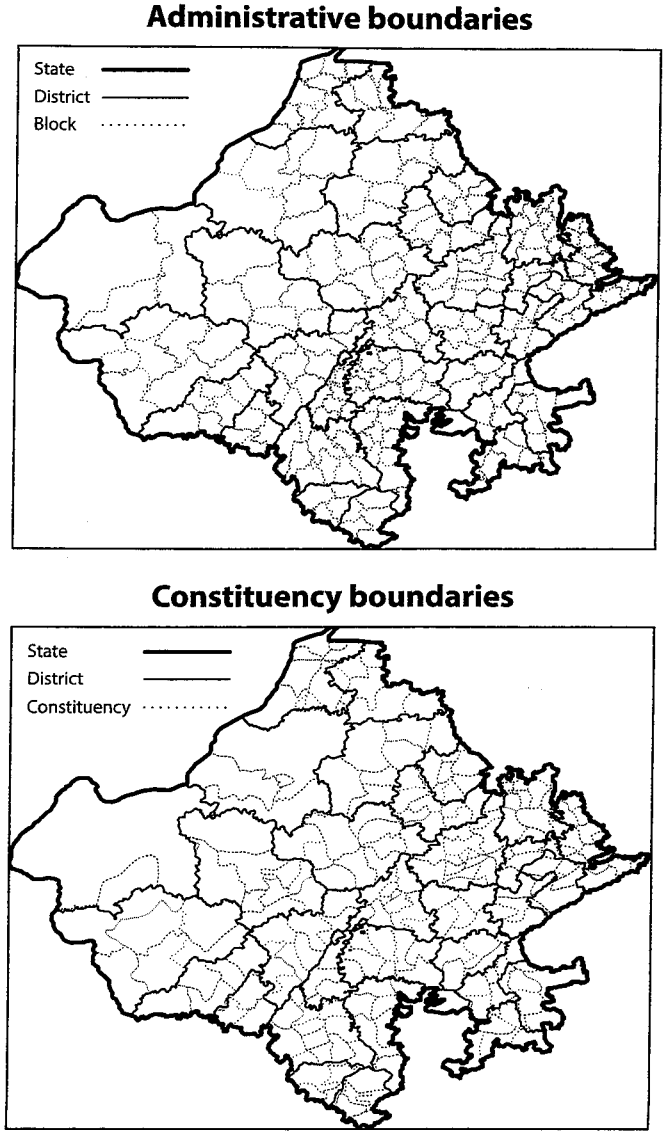

FIGURE 11.1 Block Boundaries and State Assembly Constituency Boundaries in Rajasthan

Source: Authors.

Note: Maps are not to scale.

the 1970s. In the 42nd Amendment to the Indian Constitution in 1976, it was therefore decided to freeze all these boundaries until after the 2001 Census (see Bhavnani 2014b for details). The result was that the boundaries of all constituencies were based on the 1971 Census for more than 30 years.[2] The freeze in electoral constituencies enables us to describe the socio-economic profiles for the same constituencies in 1971 and 2001, and to trace their evolution over time.

Constructing Constituency-level Estimates

There are several ways of merging administrative and political data. The easiest way to do this would be to aggregate or average the political variables that fit within a district or within a state to these administrative levels. This would allow analyses of the correlation between district (or state)-level variables. One such analysis, for example, could examine district-level patterns of socio-economic development and their relation to average political variables across political constituencies in a district. Averaging the values of political variables across constituencies forces us to ignore sub-district variations, however, and is therefore undesirable.

Another possible strategy for merging the data is to code which constituency every village and every town is located in. As has been shown by Sanjeer Alam in this book (Chapter 12), it is possible to do this on the basis of the most recent delimitation, since information is available about which villages fit into which constituency. However, when we first attempted to do this for the 1971 and 2001 Census data, it proved to be difficult. The delimitation report of 1976 specifies the extent of constituencies by mentioning blocks, but also sub-block units such as *patwar* circles. The Census of India had prepared district-wise booklets for the DC in the 1970s, specifying which villages fell into these sub-blocks. We found a couple of these booklets in the Election Commission record room in New Delhi,[3] but other than that we have not been able to locate them. For the 1971 Census, it therefore became

[2] After the 2001 Census was published, the state legislative assembly boundaries were redrawn by a newly constituted DC whose report came into effect mid-2008.

[3] Much of the information in this chapter is based on the research of the authors in the record room of the Election Commission of India in 2009, 2010, and 2011.

hard to code the constituencies of village-level data. What we can know for sure from the 1976 delimitation report are which blocks fall into which constituency, and for this project, we therefore chose to manually code the block-level data, as will be described in more detail in the next section.

For the 2001 Census, it was even harder to manually locate which villages fit into a constituency, since many districts, blocks, and villages mentioned in the delimitation report of 1976 no longer existed, had split, or had changed names. In addition, several of the sources we cared about, such as the Scheduled Caste and Scheduled Tribe Population Census Abstract (SC/ST PCA), are only available at the block level and not at the village level. To merge these variables to the constituency level, block-level merges are the most accurate approximation.

But what is the best way of merging block-level data from the 2001 Census? One common way of merging recent data is to overlay maps when maps are available. In a recent article, Banerjee and Somanathan (2007) identify which districts overlap the most with parliamentary constituencies in India, and then use district-level data as an estimate of the values for the parliamentary constituency. The assignment was done by visually comparing maps of districts and constituencies and then weighting the figures in the district-level data on the basis of the area of the constituency coming from each district. This technique can be taken a step further by using mapping software (GIS) to overlay maps and identify exactly which administrative units fit into each constituency. This is what we chose to do with the 2001 block data, as will be described later.[4]

We now describe the specific procedures that we followed to create our two sets of socio-economic profiles for India's constituencies, using data from the 1971 and 2001 censuses.

Census Estimates, 1971

Earlier, we have described the challenge of creating constituency-level estimates of census data. The other major challenge of working with these data is that the data were not electronically available. This was solved by scanning the books with block-level census data for the

[4] For the 1971 Census maps, we were not able to acquire maps showing the boundaries for blocks in a large enough format to be able to make them electronic.

15 largest Indian states in 1971. The states included in the data are the ones reported in Table 11.1. The scanned copies were then made electronic with the use of text recognition software (optical character recognition [OCR]) and remaining mistakes were manually cleaned. There were many mistakes in the data, and the cleaning work consisted of setting up logical tests for all the data, such as checking that the values for 'male' and 'female' add up to the 'total' values, that 'rural' and 'urban' add up to the 'total', that the sum of all the values for blocks within the same district add up to the values listed for the whole district, and so on. Where these tests were negative, the numbers were checked up against the original census publications and corrected.[5]

The result was a soft copy of the census data in the primary census abstract (PCA) for each of the 3,261 blocks in the 15 largest states in India. The data include variables for the population, the number of literate and illiterate people, and the number of workers and non-workers falling into various occupational categories. These variables are all available for the whole population, for male and female, for SC/ST, and for the rural and urban population in each block.

Once we had block-level data, the next task was to merge it to the constituency level. We started out with block-level census data and the delimitation report of 1976, which specifies which blocks fell into each state assembly constituency.[6] There were, on average, approximately 1.5 blocks within the area of a constituency. We had acquired the total population of the constituencies from documentation in the Election Commission record room from the 1970s and we had the population of each block in the census data. The merging files were created by calculating the proportion of the population of a block that fell into a constituency. For example, if the delimitation report listed that Constituency X (population 150,000) consisted of all of Block A and part of Block B (each having a population of 100,000), then the census values for Constituency X was calculated as:

$$\text{Values for constituency X} = 1^{*}(\text{values for Block A}) + 0.5^{*}(\text{values for Block B}) \quad (1)$$

[5] We are very grateful to the approximately 20 research assistants who helped out with this tedious work.

[6] This and other delimitation reports are available at http://eci.nic.in/eci_main1/delimitation_pub_rpt.aspx (accessed on 9 July 2013).

In some cases, two or more constituencies consisted of parts of the same two blocks. In these cases, the exact proportions could not be calculated on the basis of the population proportion. We solved these cases in two different ways. In most cases, we used the information about the exact population proportions mentioned in the records of the DC from the 1970s.[7] In the few cases where we could not find written sources among the records of the DC, we made estimates of the population based on the average population size of villages in that region and the number of villages in the constituency.[8] Since the constituency-level estimates are population-weighted estimates, there are definitely some inaccuracies in the data, but these inaccuracies are not systematic and we have no reason to believe that they will be correlated with any specific variables. The estimates might, therefore, be slightly inaccurate for each constituency, but can be treated as unbiased.

Census Estimates, 2001

In order to create socio-economic constituency profiles using the 2001 data, we started with GIS maps of the 4,208 blocks across the 15 major states in our data set, and overlaid them with maps of India's 3,341 state assembly constituencies. Since these GIS maps were created by different sources, and as Figure 11.1 indicates, boundaries common to blocks and state assembly constituencies only overlap approximately in our maps.

We used these overlapping maps to create, using ArcGIS's intersect tool, a list of the blocks that fall within each constituency, along with weights for each block. These weights were calculated as the proportion of the land area of the block that fell within a constituency. The data indicate, for example, that the state assembly constituency of Ausa in Maharashtra was composed of 67 per cent of taluka (block) Ausa and 18 per cent of taluka Nilanga. We used these weights to aggregate all block-level data from the 2001 Census to the state assembly constituency level.

[7] These records were accessed in the record room of the Election Commission in New Delhi by Bhavnani at various points between September 2008 and February 2009, and then by Jensenius in February 2011. These records were soon thereafter transferred to the National Archive in New Delhi, where they are now publicly available.

[8] A list of the cases where such estimates were made is part of the data documentation which will be released with this data.

A number of checks were run to ensure the integrity of the data. First, the delimitation process ensured that all assembly constituencies fall entirely within states and the country's administrative districts. We checked to ensure that this was the case in our data as well. Second, since all of India's state assembly constituencies are mutually exclusive and collectively exhaustive, we checked that all block weights across constituencies summed up to one. Third, and due to the imperfect overlap of boundaries that were, in fact, the same across the assembly constituency and block layers, we ignored instances where less than 5 per cent of a block fell within a constituency.

The socio-economic profiles created using this process rely on the approximate matching of regions. The major implicit assumption behind this process has to do with the many blocks that are split across constituencies, and it is: the land area weights which we are able to observe using the GIS maps correspond to the actual population splits across constituencies. So, if 60 per cent of the land areas of a block is in a constituency, and 40 per cent is in another constituency, we have assumed that the population is split 60–40 as well. This assumption is equivalent to assuming that the population is evenly distributed across the land mass of the split blocks. In the absence of detailed data on the concordance of villages and electoral constituencies in 2001, this is the best that we can do with the data available.

Describing Indian Constituencies

The data set resulting from the merging work described in the previous sections includes constituency-level estimates from 1971 and 2001 for all the census variables in the PCA and the SC/ST PCA for the state assembly constituencies in 15 largest Indian states. The only missing cases from these states are the constituencies in Bombay Municipality, where a manual match was made difficult by all the names and size of the wards changing between the time of the 1971 Census and the 1976 delimitation. There are also some additional missing values from urban areas in the 2001 data, where the GIS maps were not detailed enough to be able to create sensible data estimates.

Setting aside constituencies with these issues leaves us with socio-economic profiles for 3,065 of India's state assembly constituencies.

TABLE 11.2 Socio-economic Profiles for India's State Assembly Constituencies using 1971 Census Data

Variable	Mean	Std Dev.	Min.	Max.
Per cent female	48.5	1.9	34.0	57.1
Per cent literate	28.0	12.6	2.7	78.3
Per cent workers	33.3	5.7	21.7	60.5
Per cent Scheduled Castes (SCs)	15.4	8.5	0.2	66.5
Per cent literate SCs	15.9	10.9	2.0	66.9
Per cent SC workers	37.5	8.1	9.1	66.1

Source: Calculated by authors.

Table 11.2 provides the means, standard deviations, and minimum and maximum values for many of the key variables contained in the census data from 1971. Table 11.3 provides the means, standard deviations, and minimum and maximum values for some of the key variables in 2001.

Comparing these tables is instructive. The average literacy rates across the constituencies has almost doubled, and literacy among SCs has trebled. The percentage of workers used to be about 33.3 per cent of the population in 1971, and it went up to more than 40 per cent in 2001. This increase is probably mainly caused by more women entering the workforce. The question that remains is whether these patterns are affected by the actions of politicians? Are some politicians better

TABLE 11.3 Socio-economic Profiles for India's State Assembly Constituencies using 2001 Census Data

Variable	Mean	Std Dev.	Min.	Max.
Per cent female	48.6	1.6	43.3	54.7
Per cent rural	76.6	24.2	0.0	100.0
Per cent literate	54.3	13.0	19.5	86.8
Per cent main workers	31.3	6.9	15.4	57.8
Per cent marginal workers	9.4	4.6	0.8	35.4
Per cent non-workers	59.3	7.7	32.7	78.3
Per cent Scheduled Castes (SCs)	17.2	8.5	0.5	67.6
Per cent SCs literate	46.9	14.4	11.8	82.8
Per cent SCs main workers	30.8	7.3	12.9	58.8
Per cent SCs marginal workers	11.4	4.5	1.2	34.7
Per cent SCs non-workers	57.8	7.4	35.6	75.9

Source: Calculated by authors.

at providing their constituents access to educational facilities, thereby increasing the literacy in their areas? Have SCs seen more development in reserved constituencies? Has there been more development in areas ruled by a certain political party? These are the types of questions that we can explore with this new data.[9]

***

In this chapter, we have introduced a new data set that includes socio-economic profiles for India's constituencies from when they were first drawn in the 1970s, and then again in 2001, which is near when they were finally disbanded after having been frozen for more than 30 years. This is a first attempt at creating socio-economic data for political units across India to enable us to study the link between politics and socio-economic patterns across India. Until now, this work has been limited by the fact that political boundaries and administrative boundaries in India do not coincide and that no socio-economic data are collected for Indian constituencies. This data would be even more useful if we had also incorporated data from the 1981 and 1991 Censuses.

We end with two pleas. The first is a plea to scholars and institutes who work with socio-economic data in India to make their collected data publicly avaiable. Open access has at least three virtues. First, transparency is likely to improve data quality, as other users of data point out mistakes and suggest improvements. Second, open access prevents duplication of efforts and aids in the cumulation of knowledge, as scholars are better able to build on one another's efforts. Third, open access to data is a democratic ideal that is becoming increasingly more common. The Government of India is increasingly opening its records to the public, and tax payer-funded data will likely be mandatorily made public under the country's laws. The monopoly rents that individual scholars will lose as a result of privileged access will be outweighed by the scholastic, and hopefully societal, gains in the cumulation of knowledge.

The second plea is to government agencies who collect micro-level data in India to add indicators to their databases that enable aggregation

[9] We have explored these types of questions in our other works; see, for example, Bhavnani (2010, 2014a, 2014b), Bhavnani and Jensenius (2014), and Jensenius (2013b, 2014).

of their data to electoral constituencies. The National Sample Survey Organisation (NSSO), for example, routinely collects a wide variety of socio-demographic and economic information at the district level. A little effort by NSSO might bring an end to the impasse we have discussed in this chapter. Even adding a column for assembly and/or parliamentary constituency in its questionnaire/database will be of great help for analysis of the data it collects at the political constituency level too. This will enable researchers to study a range of questions about how political power, political representatives, and political choices affect everyday life of people living across India.