

**DYNAMICS OF RESIDENTIAL SEGREGATION AMONG
THE SCHEDULED CASTE POPULATION IN INDIA:
THE CASE OF CHENNAI, 1961 - 2001**

*Dissertation submitted in partial fulfilment of the requirements for the
Degree of Master of Philosophy in Economics of the
Jawaharlal Nehru University*

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June, 2012

I hereby affirm that the work for this thesis, “Dynamics Of Residential Segregation Among The Scheduled Caste Population In India: The Case Of Chennai, 1961 - 2001”, being submitted as part of the requirements for award of the degree of Master of Philosophy in Applied Economics of the Jawaharlal Nehru University, was carried out entirely by myself. I also affirm that it was not part of any other programme of study and has not been submitted to any other University for the award of any Degree.

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Dedicated to
My Dearest Appan, Amma and Rohith

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ABSTRACT OF THE DISSERTATION

DYNAMICS OF RESIDENTIAL SEGREGATION AMONG THE SCHEDULED CASTE POPULATION IN INDIA: THE CASE OF CHENNAI, 1961 - 2001

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Traditionally, Indian society has been very stringent with the rules of the group they belong to. These groups are not their voluntary choice but prescribed at birth, called 'caste'. When such a system exists, individuals have little choice to make. The people belonging to same social strata tend to live segregated from other sections of the population. In this scenario, the most disadvantaged would be the ones that find themselves at the very bottom of the hierarchy, in Indian case; it would be the people belonging to the untouchable castes, today's Scheduled caste population.

It is a widely held view by the academicians and the planners that caste based segregation is a phenomenon found in traditional societies and when they become urbanized, caste will cease to be the raison d'être for segregation. The present paper focuses on the changing pattern of spatial residential segregation and its influence on the socio-economic life of the SC population in Chennai City.

The first section of the study outlines the colonial history of caste segregation in Madras city with special reference to the 'untouchable' population. Later on it goes on to trace how the modernising forces like industrialisation and urbanisation, has affected their residential segregation pattern over a period of five census years i.e., from 1961-2001 census. In order to trace the residential pattern of the SC population, the index of dissimilarity has been used. The results suggest the existence of moderate level of segregation throughout the period under consideration. Even though the segregation pattern was similar till 1991, a marked departure is seen during 2001 census period. The desegregation trend during 2001 census period is attributed towards the strong peri-urbanisation process and government policy intervention. The evidence from the primary census abstract data as well as the field survey result of the SC segregated wards suggests strong link between caste identity and low socio-economic outcomes of the segregated population.

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Chapter 1

Introduction

1.1. The Context

The various dimensions¹ and aspects of residential segregation has been a major sub-field of research in the several disciplines for many decades. Residential segregation can be defined as the extent to which people belonging to different social groups reside or come into contact with different social settings (Reardon and O' Sullivan, 2004). People belonging to a particular social group often tend to cluster in homogenous neighbourhoods so as to retain and share common socio-cultural traditions or customs, community establishments and similar labour market experiences. Such clusters afford social groups with comfort, a sense of security, well-being, trust, and the ease of social interaction all of which combine to develop group identity in collective sense of place (Suttles, 1972; Clark, 1991, 1992). Although the residential segregation of groups possessing a shared specific social identity is a universal phenomenon; its pattern, scale, forms and extent varies over space and time. The reasons for such segregation could either be deliberate or voluntary based on the socio-economic, cultural and historical factors pertaining to the specific area. For instance, the major attribute that symbolize residential segregation in the US is ethnicity or colour while that in France is professional status (Massey and Denton, 1987; Taeuber, 1988; Gaschet and Le Gallo, 2005)

¹ Residential segregation includes five dimensions of measurement corresponding to different spatial variations such as evenness, exposure, concentration, centralization and clustering, each of which have different social and behavioural implications symbolizing different facets of "segregation". "A group that is highly centralized, spatially concentrated, unevenly distributed, tightly clustered, and minimally exposed to majority members is said to be residentially "segregated" (Massey and Denton 1988).

Considering the North America in particular, the housing market discrimination in the early decades of the twentieth century as well as black residential segregation in most cities became the spotlight of the literature on spatial segregation. Gradually, this body of research expanded to include other regions and sub-sections of the population. The literature also developed multiple tools for the quantitative measurement of the dimensions of residential segregation. In the US, racial residential segregation is deep-rooted in history and the racial housing patterns were the result of deliberate institutionalized racism in the housing market (Taeuber, 1988). Feitosa *et al* traces this body of literature back to efforts late 1940s and 1950s (Feitosa *et al*, 2004). One could say another form of '*apartheid*'. The black population were deliberately and systematically denied residence near white population by institutional measures as well as by private mortgage and rental agents, who purposely confined black population to strict geographical limits within cities. During the 1950s and 1960s, the US witnessed large exodus of African Americans to the central cities of metropolitan areas and the concomitant departure of the white population to the suburban areas which resulted in net declines in the central city population rates (Clemence, 1967). This large scale movement of whites during this period is generally termed '*flight from blight hypothesis*' (Mieskowsky and Mills, 1993) creating '*White donuts around Black holes*' (Hawley and Rock, 1974). The scene began to change with the passing of the Fair Housing Act in 1968. The local and institutional efforts to minimise the racial housing market discrimination bore fruits when many whites began to return to the central cities and also saw the rising suburbanisation of the black population during the 1970s (Taeuber, 1988). The census segregation indices during the period essentially showed declining segregation, but not complete desegregation. As per Taeuber noted,

While the chocolate city, vanilla suburb pattern obviously persists, there is movement in the direction of fudge ripple (Taeuber, 1988: 6).

Even now, the majority of segregation studies are done on North American cities, attempting to find new and improved methods for the measurement and mapping segregation or to evaluate the causes and consequences of ethnic segregation.

Till date, very few studies have been done on the residential segregation pattern in Indian cities and towns, yet, the results indicate the predominance of caste²-based segregation (Vithayathil and Singh, 2011).

1.2. Indian Caste System and ‘the Black Untouchables’ of India

‘The Black Untouchables’, a pejorative term often used to address the SC population of India, is indicative of the social status of the individuals belonging to this particular community in India². Caste is a social construct that still plays a significant role in the lives of many Indians in the country.

Some researchers believe that the Indian caste system has its formal roots in the *Manusmriti*, the Hindu book of law. According to Manu, society was hierarchically organised on the principle of the *Chaturvarna* – the state four *varnas* or castes derived from *Purusha sukta* of the *Rigveda* 5000BC). The four *varnas* were the Brahmins (Priests), the Ksatriyas (Warriors), the Vaishyas (Traders) and the Sudras (Menial workers). The members of each *varna* or caste performed the functions attached to their respective *varnas*, which was supposed to be hereditary, compulsory and endogamous; ideas which imbibed at the time of birth. *Manu*, further elucidates that

² The book named Dalits: The Black Untouchables of India written by V.T Rajashekar (1987) was an attempt on its own to introduce the world the social positioning of the Dalit population in a new light. In his book he has quoted an instance where in comparing the Untouchability with Apartheid at a function organised by Martin Luther King Society to celebrate the anniversary of Mahatma Gandhi’s Birthday in Town Hall, the Indian Defence Minister said that on the basis of appearance, a *Bhangi* (of sweeper class) could not be differentiated from a Brahmin, while that of Black and White was quite blatant, the prejudices in the country are as horrendous as in the US (Rajashekar, 1987: 39)

the principle of caste was the universal law of life, identified with “the code of duty, religious law and right human conduct which defines the path to virtue (Dharma) and spiritual fulfilment for all humankind” (Narasimhachary, 2002: 4). Within the caste system, individuals generally had few choices; their role in the social hierarchy were often defined and circumscribed before they were born.

This caste system survived through the centuries and persisted among the Hindu population at the time of British colonization. According to Thurston, the ethnographer who documents caste in south India, caste played an important role in a man’s life.

A man's caste affects his life from its beginning to its end. It frequently determines his occupation, and it often fixes his residence for him, most villages being divided into caste quarters. The social position and the limits within which he may marry are decided by his caste, and so is his name, and even sometimes the clothes which he and his womankind wear (Thurston, 1913: 112).

The people belonging to same social strata tended to live segregated from other sections of the population. In this scenario, the most disadvantaged would be the ones that find themselves at the very bottom of the hierarchy, in Indian case; it would be the people belonging to the untouchable castes or today’s Scheduled caste. They were often forced to live in the outskirts of the villages and were engaged in unhealthy and ‘impure’ jobs like cremating dead bodies, tanning and scavenging. Even the mere presence of them was considered impure by the upper caste people.

One of the most striking aspect of the Indian caste system has been and continue to be the existence of caste based prejudice; which was also to be seen among lowest of the caste groups. In the census 1931 report on Madras Presidency, M.W.M Yealts notes,

Caste prejudice is not a monopoly of Brahmins. This has been frequently said but will be a repetition. It is in fact more prominent at the lowest level of the community than at the highest. The watchmen who attend to the needs of Adi - Dravida must marry among themselves; the ordinary Adi-Dravida will not provide a bride or even eat at the wedding feast. Adi-Dravidas will not drink from a Chuckler's well and so on. Pallan and Paraiyans do not live in the same village; Malas and Madigas hate each other like poison. (Census, 1931: 339)

1.2.1. Imperial census and the 'outcastes'

Although the 1861 census marked the beginning of caste based enumeration, Imperial census of 1872 took it much further. This offered an insurmountable task for census enumerators due to the number of loosely defined sub-groups within individual castes Dirks has argued that the processes employed by the imperial census to enumerate the population on the basis of caste only served to reinforce and solidify the institution and it led to the re-categorisation and renaming of several caste groups (Dirks, 2001).

In the 1871 Imperial census carried out in Madras presidency, the various castes of 'Hindoos' were arranged in 17 sets (see, Appendix 1) and more than 4,761,503 were enumerated as 'outcastes'.

But in the following decades groups that were considered erstwhile so called as the 'untouchables' like *Panchama* and *Pariah*, were terms as 'Adi-Dravida' and 'Adi-Andhra' (in the Tamil and Telugu districts respectively) in the imperial census along with their original caste names. In 1922 the Madras government accepted the request from the 'outcastes' to remove the earlier terms as *Panchama* and *Pariah* from the government records and replace it with these more acceptable generic terms.

Table 1.1. Population of selected 'untouchable castes' in Madras Presidency, 1921-1931 (in thousands)

Caste	1921	1931
Cheruman	248	215
Holeya	92	50
Madiga	737	612
Mala	1,493	838
Parayan	2,387	1,117
Thoti	154	2
Adi-Andhra	-	665
Adi-Dravida	50	1,619
Adi-Karnataka	-	1

Source: Rao, 2009

Table 1.1. shows the population of selected 'untouchable castes' enumerated in Madras Presidency for 1921 and 1931 imperial census years. When we compare the two census years, we find that the number of people enumerated under the categories *Parayan* (23, 87,000), *Thoti* (1, 54, 000), or *Mala* (14, 93, 000) in 1921 reduced drastically by the next census. What is likely to have happened is that the people enumerated under these categories were shifted into the newly formulated generic caste categories. For instance, the number of *Adi-Dravida* went up from 50, 000 in 1921 to 16, 19, 000 in 1931, the number of *Adi-Andhra* which was not enumerated in 1921 to 6, 65, 000 in 1931. This suggests that many of these groups discarding their original caste names with derogatory overtone and seeking a new identity. Commenting on this, W M W Yealts (1932) noted in his report on the 1931 census,

There is something infinitely pathetic in the vain idea that a change of name can reverse the stigma of centuries; yet this community would apparently retort to Juliet that all lies in a name. It is a mistake to encourage terms which obscure real social units that is so ugly and clumsy a term as Adhi-Andhra should come to obliterate such real and lively distinction as Mala and Madiga is hardly to the good. Communities of such numerical importance and

pronounced individuality should be encouraged to retain and develop a pride in their cognomens. (Census 1931: 342)

1.2.2. Socio economic lives of the SC population

Untouchable population all over India has been extremely vulnerable. This group has historically been excluded from education throughout Indian history and certainly during the colonial era. For instance, the census of 1901 reports that the learned professions remained the monopoly of a few upper castes. Although the British attempted some efforts to encourage education amongst the lower castes, this report claims that they faced more difficulties in South India where the caste prejudices were stronger. High caste children were prohibited from sitting in the same spaces along with the children from 'unclean' lower castes thus causing physical obstacles to their access to education. Lower castes were also unlikely to educate their children because they could not afford to send their children to the schools and the census report also suggests that they were unaware of the advantages of education

After 1947, the government of India embarked on several important policies including the reservation of seats in educational institutions, government jobs, as well as in the legislative assemblies for the upliftment and better representation of the Scheduled Caste population in the mainstream. In 1991, the country underwent a massive policy change which saw the introduction of liberalisation, privatisation and globalisation in the economy. Rooted in modernisation theories, globalisation was supposed to promote neoliberal values, economic and cultural homogenization and convergence, and ultimately weakening the strongholds of caste hierarchy and related norms in Indian society (Anand, 2010).

Policy makers and academicians in the country generally consider caste based segregation as a phenomenon found only in traditional societies and they believe that as societies become urbanized, caste will cease to be the *raison d'être* for segregation. If that is reasoning holds good, Indian metropolitan cities today should

be devoid of any caste based segregation. Indeed, research suggests that the caste system has remained more or less unaffected by modernisation, globalisation and liberalisation. Studies like Banerjee and Knight (1985) on Delhi urban job market during 1975-76 revealed job market discrimination based on caste, and were in part operated through the traditional mechanism such that the untouchables are disproportionately represented in poorly paid or dead-end jobs and Thorat, Attiwell and Rizwi (2009) found caste and communal discrimination at the early phase of the job application process in urban India. They also speculate it to be similarly inequitable in the final hiring as well.

Despite the absence of constitutional restrictions on any caste group taking up any profession within the country, the majority of the SC population continue to engage in unskilled and low paid jobs. Even in the case of the handful of SC population who do get government services via reservation or through other means, they usually end up doing Class IV jobs in the country (Anand, 2010).

It is not uncommon to see persons belonging to brahminical castes complimenting an educated, well-dressed and well-positioned dalit by telling him he does not 'look like a dalit'. Unconsciously, non dalits continue to reveal that they are not beyond caste (*ibid*: 66).

The above discussion, points to the single fact that caste had and continues to have strong correlation with inequality. Economists do incorporate caste into their analysis of inequality and poverty in India. Like George Akerlof, who linked caste status to social identity and consequently to economic outcomes in his theoretical construct.

However, few studies have been attempted to study caste based residential segregation. The present study is an attempt to fill in this gap in the literature. Through this study, we attempt to trace the patterns of spatial residential segregation of the SC population in Chennai (which is a cent percent urbanised city

in India), the possible reasons for continuing segregation (if present) and its effect on the socioeconomic lives of the segregated population.

1.3. Review of literature

The initial attempts to study residential segregation were concerned with studying the housing discrimination experienced by the African Americans in US housing markets after World War I and its intensification of this phenomenon with the urbanisation and suburbanisation of American cities during the 1960s, 1970s and 1980s. From the 1970s we can see an upsurge in the number of studies undertaken on the issue of residential segregation in the African American ghettos and its consequences on the socio-economic lives of the people living in these areas. Later research was extended to include multi-ethnic groups and the prevalence of different forms of residential segregation among varied ethnic groups in countries like France, Africa and Latin America (see, for example, Gaschet and Le Gallo, 2005; Farley and Frey, 1996). During this period, simultaneous attempts were made to find appropriate methods for measuring segregation.

Measurement of residential segregation

The first major attempt to study the comparative urban racial segregation pattern was that of Woofter (1928). In later years several studies on residential segregation were carried out; measurement indices suggested and tested. One among the popular indices of segregation which continues to be used even today is the Index of Dissimilarity put forward by Duncan and Duncan (1955). Some other indices in use were the P* exposure index and the information index by Bell (1954) the Gini Index by Cogwell (1977), the Atkinson index by Atkinson (1970). In 1988, a systematic methodological evaluation of twenty segregation indices, relating it to one of the five dimensions spatial variation: evenness, exposure, concentration, centralization and clustering were carried out by Massey and Denton (1988). The indices were then used to measure segregation of three minority groups and are intercorrelated and factor analysed. Finally, they put forward a single best indicator for each dimension

which could be used as a standard measure for future studies of segregation. When segregation studies were extended to include multi-group segregation issues more diverse and advanced methodologies were developed. In the recent years, researchers are focussing on developing spatial measures of segregation (Wong 2002; Reardon and o' Sullivan, 2004).

Impact of residential segregation

Economists were more interested in analysing the impact of residential segregation on the lives of the segregated population. Researches suggest that the residential segregation strongly determine the socioeconomic outcomes of the segregated population. A seminal work on the economic impact of residential segregation of the segregated population was by Kain (1968), who examined the relationship between the metropolitan housing market segregation and the distribution and levels of non-white employment using the data on Chicago and Detroit in 1960. He found empirical evidence for declining black employment with distance from black neighbourhoods. The conclusion that the racial segregation in the housing markets affects the distribution of minority employment and reduces their job opportunities became popularly known as the 'Spatial mismatch hypotheses'. The later years saw many studies testing the empirical validity of this hypothesis (Masters, 1974). Some studies like Massey, Condran, and Denton, (1987); Ihlanfeldt and Sjoquist, (1989); Stoll, Holzer and Ihlanfeldt, (2000); Anas, (2004); Fischer *et al*, (2004) suggests that the segregated minority population faces strong barriers to residential mobility and therefore they are forced to live in neighbourhoods with fewer resources and amenities than the majority population. The minority neighbourhoods are poorer, more dilapidated areas often characterised by high rate of poverty, dependency ratios, crime rates and mortality rates. The minority population living in the ethnic enclaves are often forced to send their children to nearby public schools dominated by students from lower income class with poor academic performances.

Residential segregation in India

An exceptional feature of segregation in India and south Asian countries like Pakistan and Bangladesh is that the basis of segregation is 'caste' rather than 'ethnicity or colour' as was the case with the studies reviewed earlier. Very few attempts have been made to study the urban residential segregation in India and in particular the spatial aspects of urban residential segregation. However, we do possess a fair amount of sociological literature on residential segregation based on caste in Indian villages (for example, Beteille, 1965, 1991).

One amongst the earlier attempts in this field was by Mehta (1969) on the residential pattern in Poona by caste and religion from 1822 to 1965. The study put forward certain tentative observations "applicable to the cities all over the world". The propositions include the following: the residential segregation is a universal phenomenon irrespective of the underlying factor of course and the dissimilarity increases with socio-economic status or prestige ranking. Another proposition Mehta puts forth is that modernising forces like industrialisation and urbanisation have little impact on residential segregation. Residential centralisation and decentralisation of a particular group depends upon the age of the city as well as the type of development that takes place and this centralisation or decentralisation is attributed to wealth or poverty. This study stands apart from the other studies especially due to its extensive coverage of historical period and its use of historical data. Although Mehta's study is valuable, we do not agree with the author's proposed conclusions being applicable to cities all over the world. Several studies on residential segregation pattern in the cities of North American cities counter the author's observation that the modernising forces have little impact on segregation. Even some of the ecological studies done on the Indian cities provide us with contradicting evidences³.

³ These studies are discussed in detail in the next chapter

An interesting critique of Mehta's study was by D' Souza (1977). The study dealt with the question of whether the urbanisation resulted in the desegregation of the scheduled caste population. Using the data from the District Census Handbook of Amritsar District for 1961 and 1971 has been used to find the index of segregation for the scheduled caste population. This study finds that, with the increase in industrialization and urbanisation, the degree of segregation of the scheduled caste population in towns of Amritsar district tended to increase, and this increase was particularly associated with localities of lower socio-economic status and is concentrated in peripheral localities. D'Souza therefore concludes that increasing industrialization and urbanization led to the deterioration in the residential status of scheduled castes population in urban agglomeration.

Another significant study detailing the socio-spatial differentiation and segmentation was the one by Dupont (2002) on the metropolitan area of Delhi. The enclave or ghetto phenomenon was found both among the privileged and underprivileged population groups. This was the combined effect of income differentials, socio-economic status and affiliations to caste, religious and professional group as well as geographical origin. While the author provides us with exhaustive qualitative detailing on the various socio-spatial aspects of specific areas in metropolitan Delhi, he unfortunately misses out on quantitative assessment of the data available for the city.

The most recent and seminal literature in the Indian context was that of Vithayathil and Singh (2011) who examined the residential segregation patterns of India's seven largest metropolitan cities. They used the index of dissimilarity to calculate the levels of residential segregation by caste, gender and socio-economic status in these cities. The residential segregation among the cities with similar ward size was compared and the seven cities were then classified into two groups. Chennai and Kolkata formed the first group while Hyderabad, Mumbai, Delhi and Ahmadabad formed the second. As the median ward size of the Bangalore city was smaller compared to other cities, Bangalore was excluded from the comparison. The study found that in

the first group Mumbai was 19.5 percent more segregated by caste than Chennai and in the second, Ahmedabad had the highest levels of residential segregation. The residential segregation on the basis of gender and socioeconomic status were found to be lower compared to that of caste based residential segregation. The study underlines the fact that caste segregation predominates over other forms of segregation in the Indian metropolitan cities. However the authors themselves admit that the proxies they have used for calculating socio-economic status of the population have been naive.

Despite the above quoted studies, the research on residential segregation is still in its infancy and doubts are still raised on the extent and importance of caste based residential segregation despite the works of Vithayathil and Singh (2011). There are no economic studies on the specific issue of caste based residential segregation in India which consider how caste influences residential location choices and socioeconomic lives of the segregated caste group. Given this lacuna, we have attempted to carry out a city specific study of residential segregation of the Scheduled Caste population and the consequences of residential segregation on socioeconomic lives of this population.

1.4. Relevance of the study

The residential choices of individuals and consequences of these choices have been an area of interest among many western social scientists including economists for many decades now. In India however, economists have not given this issue the deserved research attention, although research has emerged from other disciplines such as geography, sociology, social psychology. Going through the segregation literature, an indubitable revelation was that despite some sociological and ecological studies, there was an absolute dearth of economic studies addressing the issue of residential segregation and its impact in the Indian context. The residential segregation of a particular social group is generally thought to generate a whole lot of socioeconomic problems like concentrated poverty, unemployment, high crime

rates, illiteracy and deprivation. Populations such as the Scheduled castes form the most disadvantaged group of people in the India with high rate of illiteracy, unemployment, low income and standards of living. Comprehending the intricacies of the residential segregation experienced by the SC population in an Indian metropolitan city may offer yet another dimension to our understanding of the challenges that confront them in today's India. Given that India has an age old history of caste-based residential segregation, this issue is particularly deserving of the interest and efforts of the social scientists. Further, this issue also possesses implications for administrators and policy makers. For instance, understanding the residential segregation pattern and changes therein in the cities such as Chennai over time has urban planning implications; and may permit planners to formulate measures and policies that improve conditions as well as to assess the effectiveness of policies. Such research would help provide insights into the changes that have been brought into the lives of these populations over the years as a result of the forces such as industrialisation, urbanisation and liberalisation as well as insight into the outcomes of the special privileges provided to these populations by the government. This is a humble effort from our part to fill the gap in the literature on Indian residential segregation.

1.5. Objectives of the study

1. To trace the spatial segregation experienced by SC population in Chennai.
2. To assess the impact of spatial segregation on the socio-economic conditions of the SC population in the city.

1.6. Methodology

In this section, we present the methodology employed to answer our research questions. For this purpose, both primary data and secondary data were used. Secondary data include ward level Census data from 1961 to 2001; cartographic maps were used for depicting the spatial segregation pattern of SC population in the city; published papers in national and international journals, state and union

government reports, newspaper articles, and government websites were also used. As we lack longitudinal data for meeting the second objective we undertook a primary survey. The primary data was collected through face to face interview method, for which a structured questionnaire was used.

1.6.1. Sample design

As the present study was particularly designed to explore the dynamics of residential segregation with special reference to the SC population in the Chennai city, Purposive Sampling technique was employed to carry out the study. The detailed sampling method is given in Chapter 4.

1.6.2. Questionnaire

The survey was conducted using a well structured questionnaire with 37 questions which covered several domains including the demographic profile; socioeconomic status as well as the subjective evaluation of the public amenities, caste-discrimination, neighbourhood preferences and relocation. The demographic profile covered the age, sex, household size, number of school-going children in the house and marital status of the respondent. The questions on the socioeconomic covered the educational qualification of the respondent, monthly income, occupation, type of the house, ownership of the house, availability and access to electricity, toilets and drinking water, ownership and type of ration card. The subjective evaluation of public amenities was addressed through specially designed questions, answers of which were to be rated on a five point scale of 0 to 5 on the quality and provision of public amenities. The respondents were asked on the discrimination they had to face in the society due to their caste status for the evaluation of the caste discrimination. In order to get a picture of the respondents' residential neighbourhood preferences, they were asked questions on the caste status of their preferred neighbourhood. The questionnaire ends with the questions on the respondents' willingness to relocate and their reasons for the specific choice. The questions were framed in English but asked in Tamil. (see, Appendix 2 for the Survey Questionnaire)

1.6.3. Analytical Methods

To trace the residential segregation pattern of the SC population, which is the first objective of this study, Dissimilarity Index (D), using the ward level census data of the SC and Non-SC population has been calculated for 1961 to 2001 census periods. In order to analyse the second objective, i.e., to assess the impact of spatial segregation on the socio-economic conditions of the SC population in the city, each ward was treated as separate entity and studied. Simple statistical tools like percentages, descriptive statistics, measures of association and various indices like Public Amenities Index (PAI), Standard of Living Index (SLI), Social Capital Index (SCI) and Discrimination Effect Index (DEI) were used to measure the level of public amenities, standard of living, the extent of social capital available and the extent of discrimination faced by the SC population respectively. Besides this, LOGIT model was used to determine the major factors influencing the discrimination of SC population in the city.

1.7 Chapter Scheme

The study has been organised in five chapters. The first one is the introduction chapter dealing with the context of the study, review of literature, relevance, objectives, methodology and limitation. The second chapter deals with the theoretical framework of the study. The third chapter focus on the analysis of residential segregation of the SC population in Chennai. The residential segregation at a micro level is dealt in the fourth chapter. With the fifth chapter, we summarise conclude our study on the dynamics of residential segregation in Chennai.

1.8. Limitations of the study

There are several limitations to this study.

- The geographical boundaries of the wards have varied over time. In the case of Chennai city, the number of wards has increased from 100 to 150 during

the period 1961 to 2001 and the size of the wards has also varied over the years, rendering the comparison over the years rather difficult.

- As the census data have only three group classification of data (into general population, SC and ST populations). The broader picture of ward level caste wise segregation could not be covered under the study.
- Due to limited resources and time, the field survey had to be restricted only to SC households while surveying Non-SC households would have brought out other dimensions of the issue and permitted us to make comparison between the aspects of caste based segregation and segregation based on other criteria.
- The ownership of durable goods was not assessed as well as very few questions were incorporated that evaluated social capital.
- The residential segregation for the city has been estimated only till 2001 census as the 2011 census ward level data has yet to be published therefore limiting our conclusions on the implications of the liberalisation policies on the residential segregation of the city.

Though, the study suffer from the above limitations, the conclusions derived from the available resources has been genuine and were able to fulfil the objectives of the study.

Chapter 2

Theoretical Framework

2.1. Introduction

Ever since the publication of the landmark work by Earnest Burgess (1928), the issue of residential segregation has begun to draw attention from social scientists around the world. According to Burgess, residential segregation was the result of '*economic competition for scarce urban land*', while the working classes lived closer to the city centre, the middle class residents settled farther away from the city centre. More affluent residents, as they could afford the transportation costs of the commuter's zone, settled farther away from the city centre (Burgess, 1967: 50-56; cited by Farley, 1977: 497)

Since then, there have been several seminal works carried out on the issue of residential segregation, particularly those on the Afro-American ghettos of North American countries; which have been discussed before. However, the existing literature on this field mainly focussed on either mapping and measuring the scale of segregation or examining the forces responsible for as well as the effects of segregation (Holloway, 2000). Very few attempts were made to study residential segregation in the Indian context.

The chapter is divided into six sections. In the first section, we are trying to link caste and its influence on social identity and the choices available to individuals. The second section deals with Schelling's model on Residential Segregation. Various theoretical perspectives on the issue of residential segregation are discussed in the next section followed by a section on ecological perspectives on Indian cities. The fifth section briefly notes the impact of residential segregation on the lives of the segregated. Finally, present a section on the theoretical framework we follow in the present study and conclusion.

2.2. Caste, Identity and Individual preferences

Recent works within the neo-classical framework do offer insight explaining the Indian caste system and its various dimensions in main stream economics, such as Akerlof (1976, 1980), Romer (1984) and Scoville (1991, 1996 and 2003), by far the most influential is Akerlof's work (1976, 1980). According to this neo-classical framework, under the Indian caste system, occupation is hereditary, endogenous and homogenous and therefore the factors of production are immobile; leading to lack of competition, allocative inefficiency and failures of market mechanism (Thorat and Deshpande, 2001). In a more recent work by Hoff and Pandey (2004) based on experimental research proved that a prolonged history of social and legal disabilities (such as those prescribed by caste) can have its impact on individuals' expectations; thereby leading to unrelenting effects on a group's monetary outcomes. The experiment was run on 321 high caste and low caste male student volunteers in India. On the event of maze solving for which monetary rewards were fixed, the performance of the students was unaffected as long as their caste identities were hidden. As soon as caste identity was made public and the results revealed robust caste gap in their performance. And when a random draw was introduced, the caste gap vanished. It showed that when the caste identity is known, those belonging to the lower caste expect that their efforts to be inadequately rewarded. The above discussion suggests that adhering to the caste system lead to inefficient outcomes, but it remains persistent and influences the lives of its group members. The reason can be found in Akerlof (1976) suggests reasons for this persistence when he points out that the caste system still persists for the simple reason that the ones who do not break the social customs reap the maximum benefit rather than those who break it. So long as majority of the group members attain positive utility from obeying social customs, and until their marginal benefits equals marginal costs, the social customs will remain intact.

In the above paragraph we discussed the importance of caste in economic analysis, now let's move on to explain the importance of caste in the formation of a person's

social identity and its influence on the individual's choices, motives and even the socio-economic life. Social identity may be defined as a person's sense of self formed from their membership in social groups (Chen and Li, 2009). Social group identity may be formed on the basis of gender, occupational status, race, religion or caste. Individuals identify themselves with people in a particular category and differentiate those categories from others (Akerlof and Kranton, 2000). In short, identity allies individuals with social groups as well, expecting them to prescribe to the norms and rules dictated by the group. Any deviation from it produces disutility.

Akerlof and Kranton (2000) proposed to incorporate 'identity' into game theoretic model and try to explain how a person's identity influences their economic outcomes. In this model, they attach the identity factor to the utility function of individuals to the situations like workplace gender discrimination, social exclusion, household division of labour and poverty. They proposed the following utility function $U_j(.)$ for the above said situations.

$$U_j = U_j (a_j, a_{-j}, I_j)$$

According to this model, utility depends on j 's identity or self-image I_j , his individual j 's action a_j , and other's action a_{-j} . Further, the individual's identity I_j depends on the j 's assigned social category C_j , the extent to which the individual j 's actions and other's actions is consistent with the prescribed behaviour P . Thus, the social status of a category is represented by the function $I_j(.)$

$$I_j = (a_j, a_{-j}, C_j, \epsilon_j, P)$$

With higher social status, the individual's self-image also gets increased. The increase or decrease in the utility thus calculated was identified as the "*gains or losses in identity*". The results thus obtained through this utility function suggested marked variations in outcomes, after the inclusion of identity in the individual's utility function. In the conclusion, they also suggested that identity should be incorporated

in economic analysis; a theoretical addition which can give entirely new dimension in understanding problems like social exclusion and poverty.

Identity also plays a pivotal part in choosing 'who they want to be'. Here, Akerlof and Kranton (2010) clarifies that the choice may not always be conscious as in the case of race, ethnicity or family background which impossible to change by individual decision and the limits on such choices will have important implications on the individual's economic well-being. Concisely, the social identity of an individual plays a crucial role in the formulation of his or her rational choices or preferences which can have a bearing on their socio-economic life. However, in the Indian scenario, caste is among the key instruments which shape the social identity of an individual, thus influencing the rational atomistic choices or preferences of his or her day to day life.

It follows, therefore, that the social identity of an individual has huge impetus on the individual's choice of residential location. For instance, the essential reason of belonging to a particular ethnic group may act as an incentive for an individual to choose a residence near by another member of his or her ethnic community. Clark (1986) also explains residential segregation as a result of the individual's rational choices regarding housing production and consumption in the housing market. At times, the rational residential choice made by that individual may have unforeseen impact at a larger scale, leading to residential segregation. This is the premise of the model put forward by T.C Schelling in 1971 that links individual preference and residential segregation. The subsequent section gives a brief outline of Schelling's model.

2.3. Schelling's Model on Residential Segregation

One of the most celebrated and tested models on residential segregation is the one proposed by Schelling's *spatial proximity model* and *bounded neighbourhood models* of segregation (Schelling, 1971). According to him, indiscernible variations in the individual non random choices can lead to 'strikingly polarised results' at aggregate

levels i.e., even the slightest differences in the individual's residential preferences at the micro level can lead to a larger impact on the overall residential segregation pattern. In similar ways as the rational preference made by small savers hardly has anything to do with overall depression in the economy, the individual choice made by the members of a minority group to reside in a particular location may or may not be associated with the colossal impact of their collective preference for residential location (*ibid*). He further goes on to say that "One might even be tempted to suppose that some 'unseen hand' separates people in a manner that, though foreseen and intended by no one, corresponds to some consensus or collective preference or popular will" (*ibid*: 146).

Schelling also advanced a bounded neighbourhood model where in every individual in a group is concerned about the racial composition of the neighbourhood in which they wish to reside. There is one combination that each individual prefers to its alternatives and individuals will choose to reside in one location till the desired composition holds and once the composition changes and the number of the members of the opposite group exceeds the limit or 'tolerance' (as Schelling call it; *ibid*: 167) is reached, the individual will choose to relocate to another location that suits his preference. In short, Schelling's model shows how the individual preference for one's neighbours to be of the same ethnic origin or the preference for a mixed neighbourhood up to a certain limit, can end up in the total segregation of the society.

Schelling's model has been widely influential among the social scientists. Many scholars have tested for its validity in the real world and others have extended the model to address the actual situation of segregation (Clark 1991; Clark and Fossett 2008). However, Schelling's model has been challenged its applicability on a larger scale and the influence of city size, the threshold level of neighbourhood comfortability and density of population (Singh *et al*, 2009).

2.4. Other perspectives on Residential Segregation

Apart from Schelling's model, there are various other perspectives for residential segregation. Holloway (2000) points out that majority of the segregation literature are rooted in four conceptual frameworks viz-a-viz *neo-classical*, *institutional*, *structuralist* and *ecological* perspectives, which help provide "dominant yet problematic" explanations to the issue of residential segregation.

The neo-classical perspective on residential segregation (Clark 1986; Schelling 1971) has been explained in the beginning of the chapter. In this section, we present the *institutional perspective* which suggests that housing choices of minorities are dictated by the majority population via formal and informal restrictions imposed on them. Formal restrictions could be in the form of government housing laws or policies and informal restrictions by way of higher rent, exclusionary prejudice of the majority (forward caste) or inclusionary prejudice of the minority (backward caste) (Yinger, 1995; Galster 1988, 1989, 1992; Massey 1995). The *structuralist perspective* concurs with ideas of the institutional perspective of minority segregation inflicted upon by the majority population (Holloway, 2000).

Ecological theory considers residential segregation as a result of the people's choice to attach themselves to areas which symbolise their socio-economic or cultural trait. People tend to "select residential sites in cities on the basis of racial, cultural, religious, or ethnic preferences or prejudices, to choose residential locations that are symbolic of wealth, power, or social prestige, or to gravitate to low-income or low prestige areas whose costs of occupancy are within the limits of their purchasing power" (Gist, 1986: 23).

The *institutional* and *structuralist perspectives* emphasise the involuntary involvement of individuals in segregation and consider it a natural phenomenon while the *ecological* and *neoclassical perspectives* consider residential segregation as a result of individual actions, although they disagree over whether it is social competition or economic competition that influences it (Holloway, 2000).

2.5. Indian cities: An Ecological Perspective

The ecological studies mainly follow factor ecological approach in studying the urban ecological structure. It employs factor analytical techniques, based on a set of socio-economic variables to identify the underlying structural dimensions of the issue. Unlike the American cities where the residential segregation of different ethnic groups are clearly identifiable, Indian cities do not depict such marked differences except for those 'population groups at the polar ends of the social status hierarchy' (Rao and Tiwari, 1986: 221). In the Indian cities, individual's residential location choice is closely associated with social factors like religion, caste and language rather than economic factors like occupation and income (*ibid*). Moreover, these choices enable the households' access to their desired location of rents lower than the market rate. Consequently, Indian residential areas will have representation of people belonging to all levels of income and therefore contravenes 'the classical rich centre and poor periphery' model (*ibid*: 122).

Weinstein (1986) in his study on the ecology of Madras found that the classical models on residential location do not apply to the city as the Indian cities in general due to the presence of 'a shared subjectivity, a culture' which is present in the latter (Weinstein, 1986: 268). He found that the residential segregation of the city was organised at a very small scale with the presence of substantial variation in scale within census tracts. "Groups which are far apart in relation to social hierarchies (eg., Caste) can often live very close together (while still observing strict codes of social segregation): servants living near prominent families, houseless persons sleeping near middle class apartments, slum dwellers building shanties next to expensive commercial or residential property." (*ibid*: 269).

One among the most noteworthy ecological study on Calcutta was by Bose (1965, 1968). According to him, people belonging to particular ethnic groups cluster together in homogenous ethnic quarters. People belonging to different ethnic groups maintain caste relationship with their own caste group as per the general caste rules

in India. The social order of the city was found to be in a transitional stage where caste was being replaced by an increasingly distinct class system.

In another study, Chakravorty (2000) analysed the spatial transformation of Calcutta from colonial city to a globalising city. He noted that the residential segregation pattern based on occupation, religion, caste and ethnicity have persisted in the post-colonial period. He further noted that the ghettos thus continued are not geographically large. Another thing is that these spatial segregation patterns is not confined to the poor but are common for other social groups as well. For instance, while the *marwaris* (very prosperous entrepreneur class belonging to Rajasthan) tended to live in the segregated neighbourhoods of Burrabazaar and the Park street area, professional South Indians reside around the Lakes and professional Bengalis in the South Calcutta.

On the ecological study of Bangalore, Gist (1957), observed that the city's urban structure has a heavy bearing on its historical past. Within the city, those categories belonging to extreme caste groups showed high segregation tendencies. Unlike the segregation pattern of the American cities, the peripheral areas or the outskirts of the city are occupied by the 'depressed castes'. The city has also shown high religion-based segregation especially among the Muslim community and Anglo-Indian communities. The spatial isolation of the Anglo Indian community was considered the logical outcome of social isolation, since they were *persona non grata* to the British and all well as to many Indians. Another study on Bangalore by Rao and Tiwari (1986) noticed that just like any other Indian city, Bangalore retained its rural traditions, which is evident from the socio-economic spatial segregation of the city based on religion, caste and language regardless of the dominance of secondary and tertiary sectors.

In the case of Ahmedabad city, three general features of the social structure and geographic distribution have been identified by Weinstein and Pillai (1978). They are: 1) the coexistence of the traditional and modern, urban and rural, upper rank

and lower rank characteristics within the city; 2) There is a solid relationship between the city's historical and geographical characteristics and its present social composition; 3) Despite the census and survey data indicating social change in the recent years, there is no clear tendency towards modernisation of the city. These characteristics indicate that Ahmedabad's contemporary social structure draws extensively on the traditional/local and modern/western elements which contributed have contributed to its evolution in the past.

The above studies on the Indian cities pinpoint some common features of the ecological structures of the Indian cities. Firstly, the present ecological structure of the cities has some bearing upon the historical spatial pattern of the city. Secondly, despite being urban centres, the social structure of the cities are similar to those of rural areas of the country, where in the caste system plays a pivotal role in determining social interaction and finally, the spatial segregation is a common dictum in all the cities. People sharing a similar social identity tend to cluster in some specific quarters of the city, maintaining their distinct identity even though the proximity of these clusters with other clusters may be small. Finally, the ecological structure of the Indian cities may fail to find a suitable theoretical explanation in the classical models on the ecological structure of cities.

2.6. Impact of Residential Segregation

Residential segregation and its impact on the socioeconomic lives of the segregated population in metropolitan areas is a fairly untouched area of investigation in the Indian milieu but it has been a wide area of interest among the sociologists, economists and anthropologists of the Western world, particularly those of the black neighbourhoods of North American cities.

The residential segregation generates *positive* as well as *negative externalities*. Usually the segregated neighbourhoods are characterised by concentrated poverty, high rates of unemployment, illiteracy, physical decay and high crime rates. Other forms of negative externalities arising out of residential segregation are spatial isolation

which leads to difficulty in getting jobs, positive peer group effects in segregated schools, prevalence of crime networks, fewer opportunities and amenities, separation in schools, parks, stores and other institutions, labour market discrimination and *redlining* (refusing credit to people in segregated locations as they are usually considered to be risky borrowers) by the lenders (Anas, 2004; Becker, 1957; Logan, 1978, Taeuber, 1964)

The segregated neighbourhoods that are formed out of voluntary atomistic decisions can produce "*spatial agglomeration*" economies which exist "when the proximity of economic agents reduces cost", such as sharing a common church or temple, preserving rites, customs, rituals or language, financial or other kinds of assistance from the neighbours, enjoying common play ground, parks or other recreational activities (Anas, 2004: 5). Residential segregation also generates "*social capital*". Social capital may be defined as the aggregate "actual or potential resources" arising out of "the possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (Bourdieu, 1985:248, 1980; cited by Portes, 1998:3). It may also be defined as those resources that individuals derive from particular social structures which they use to fulfil their own interests (Baker, 1990) that social capital may be in the form of safety and trust the people derive as a result of the peculiar neighbourhood or the existence of community or caste organisations catering to the needs or formed for the upliftment of the lives of the people in the locality.

2.7. Theoretical Framework of the present study

In our study, we are following the neo-classical model which considers residential segregation as a result of individual preference for particular residential location. We assume that the individual preference for residential location is influenced by social identity, in this case, the caste-status of the individual. Along with this basic factor we also consider another three factors influencing the individual preference for residential location. They are the perceived social identity of the individual by the

other sections of population in the society, the strength of the traditional, religious and cultural stigma attached to the particular group of population and the historical residential pattern of the concerned social group.

Our study has been designed in such a way that all the four above said factors are analysed in detail. But the assigned social identity by other sections of population and the strength of the social stigma are analysed from the experience of the segregated population in their day to day lives.

2.8. Conclusion

The above theoretical survey on the residential segregation suggests the non-existence of a comprehensive model that could answer the complex nature of residential segregation found in Indian cities. Even though this area of research carries much socioeconomic and urban policy implications, it has hardly been noticed from an economic perspective in India. Our study compasses a city-level residential segregation and its socioeconomic issues relating to residential segregation.

Chapter 3

Spatial Segregation of SC population in Chennai City

3.1. Introduction

Even Today, caste segregation in the India is discussed, we discuss it in the rural context rather than relating it to Indian towns and cities yet some studies suggests that caste segregation is very real in Indian cities (Vithayathil and Singh, 2011) yet several questions remain unanswered about the various dimensions of caste segregation. For instance, has caste segregation remained the same since independence or has it changed over the years if so, to what extent. How far has it affected the lives of the segregated? In order to unravel the intricacies of caste based residential segregation in urban area, we have attempted a city specific study examining the origins, extent and changes of this feature. We chose Chennai (earlier known as Madras) as our area of investigation because, prior research has already pointed caste based segregation in Chennai

As Durkeim (1954) suggests the land use patterns as well as population distribution within a city is envisaged as the partly intended outcome of social behaviour, which extends itself into space as well as time. Therefore, we attempt to examine the residential segregation of the SC population in Chennai chronologically in order to analyse various dimensions of the issue.

This chapter begins with a brief section on the history and growth of Madras. In the next section, we analyse the residential segregation of the SC population in colonial Madras and in the third section we explore the spatial residential segregation pattern of the SC population in Chennai during the four decades from 1961 to 2001. This section presents the index of dissimilarity as an assessment of the residential segregation of the SC population in the city. The concluding section of this chapter discusses some possible reasons for the changing trends in the index of dissimilarity.

3.2. A brief History and Growth of Madras City

The story of the city of Madras in many ways exemplifies the rise of British colonial power in South Asia. Madras or Fort St. George was the first port city to be founded by the British during the 1644 (Roberts, 1994). Prior to the advent of the British, the present day locale of Madras or Chennai was a comprised a collection of scattered villages; which included areas such as Mylapore and Triplicane both of which continue to have religious significance for Hindus and Christians (Madras District Census Handbook, 1961).

After the failure to establish settlements in Masulipatam, Armagon and Peddapalli, the site of Fort St. George was identified by Francis Day, who had been a member of the Masulipatam Council and an early chief of the Armagon factory. At the time, the Coromandel Coast was under the nominal rule of the Rajah of Chandragiri, who entrusted his local chiefs known as the Nayaks, to rule different districts almost independently. Amongst these was the local chieftain named Ayyappa Nayak who introduced Francis Day to the area that became Fort St. George. The main attraction of Madraspatanam for the British, who at this point were primarily traders, was both its location and the access to the comparatively cheaper calicoes woven at Madraspatanam. Day obtained from the ruler Pedda Venkata a grant for the territory as well as privileges and a licence to build a fort and a settlement there. Within a few years, Fort St. George was built. The buildings and streets that sprang up near the Fort self constituted White Town, which was settled primarily by Europeans. To the north, adjoining White Town was established the much larger Black Town inhabited the local population (*ibid*).

The later years of the seventeenth century and the eighteenth century witnessed the steady growth of Madras under the East India Company and its many Governors. Among the major development of this period was the institution of a corporation headed by a Mayor for the city of Madras. The period from 1803 to 1827 represented a period of British territorial consolidation in South India. The later periods saw the

gradual territorial expansion of British rule as well as the establishment of various important socioeconomic and administrative institutions. Some of these institutions include the first regular census made in 1871, establishment of the Madras Medical School (1835), the Railway Company in Madras (1845), the Madras University (1857), the Civil Engineering College (1862) and the new buildings of High Court (1889).

Both under the British rule and after Independence, the urban growth in Madras has been phenomenal. While in 1871, the area of the city was only 27 square miles with a population of 397, 552 (*ibid*: 18) by the 2001 census, it had expanded to a city of 176 square kilometres with a population of 4.3 million. The city corporation was divided into 8 wards in 1867, 30 divisions in 1936, 40 divisions in 1919, 50 divisions in 1947 and 100 divisions in 1959 (Madras District Census Handbook, 1961: 18). During 1971 it again increased to 120 wards and then to 150 wards in 1981 and to 155 wards as per 1991 and 2001 census.

3.3 The present day Chennai city and its Scheduled Caste population

Today, Chennai has grown to become the sixth largest city in India with a population of 4.6 million and it is the fourth largest metropolitan city (the city proper along with its suburbs) with a population of 8.6 million as per 2011 census. The city is presently divided into 155 wards. As with most other large metropolitan cities of the world, Chennai has been under the influence of large scale suburbanisation for the last few decades. Table 3.1. shows the decadal percentage variation in the Chennai's population and its adjacent districts.

Table 3.1. Percentage decadal variation in population for Chennai, Thiruvallur and Kancheepuram districts

District	Percentage Decadal variation				
	1961-71	1971-81	1981-91	1991-01	2001-11
Chennai	45.2	27.0	17.2	13.1	7.8
Thiruvallur	30.0	30.5	31.5	23.1	35.2
Kancheepuram	30.3	28.2	26.1	19.2	38.7

Source: Extracted from Singh (2011)

The last four decades reported in the Table demonstrate a strong trend of suburbanisation in Chennai and its suburban belt comprising the areas of Thiruvallur and Kacheepuram districts. The decadal population variation has shown a larger increase compared to Chennai in these decades. These districts are currently the major hubs of industrial activity especially Information Technology and manufacturing suggesting that this growth is driven by the influx of non Tamil labours from around the region and from other states (Singh, 2011)

The Table 3.2 shows the caste wise break up of Chennai's population from 1961 to 2001. And we focus on the changes in the SC population since that is the subject of this thesis. In 1961, SC population in Chennai stood at 12.38 percent which fell to 10.49 percent in 1971 which has been attributed to the out migration of SC population to the nearby districts (CMDA Master Plan II, 2006). Again in 1981, the SC population increased which was attributed to the expansion of city limits in 1978 via inclusion of some of the panchayats around the city such as Velacheri, Taramani, Kanagam, Thiruvanmiyur, Kodambakkam, Saligramam, Koyambedu, Senjery, Thirumangalam, Virugambakkam, Nesapakkam, Kolathur, Villivakkam, Konnur, Erukkanchery, Jambuli, Kodungaiyur, and Selaivoyal, comprising about 47 Sq.km (*ibid*).

Table 3.2. Chennai population by caste from 1961 to 2001 (in percentages)

Years	SC (in Percentage)	ST (in percentage)	Others
1961	12.38	0.08	87.54
1971	10.49	0.03	89.48
1981	13.36	0.16	86.48
1991	13.79	0.21	86.00
2001	13.77	0.15	86.08

Source: Census of India, various years.

3.3.1. The socioeconomic status of the SC population

Before going into the issue of residential segregation of SC population in the city, we will have a brief review of the socio-economic status of this group with respect to

that of Non-Scheduled Caste⁴ (hereafter Non-SC) in the city as per 2001 census. Table 3.3 deals with the distribution of households among the SC and Non-SC population by the condition of the houses within the city. It reveals that, the percentage of Non-SC population live in good houses were comparatively higher than those of the SC population. While 19.04 percent of the SC population live in barely liveable houses, only 6.74 percent of the Non-SC population live under such condition. Almost 1.20 percent of the SC population live in dilapidated houses while only 0.40 percent for the Non-SC population live in the same condition.

Table 3.3 Distribution of Households by condition of houses

Condition of the household	SC	Non-SC
Good	79.78	92.86
Liveable	19.04	6.74
Dilapidated	1.18	0.40

Source: Census of India, 2001

When we take into consideration access to amenities such as electricity and latrines, the SC population of Chennai is far behind the Non-SC population in the city as is evident from Table 3.4.

Table 3.4. Accessibility of basic facilities

Accessibility of basic facilities	SC		Non-SC	
	Yes	No	Yes	No
Electricity	83.2	16.80	96.62	3.38
Latrine	70.31	29.69	94.44	5.56

Source: Census of India, 2001

Literacy rate and the occupational status are also fair indicators of the socioeconomic status of a population group. According to 2001 census, the literacy level of the SC population in Chennai was 75.6 percent while that of the Non-SC population was

⁴ We are including ST population along with other population and denoting it as Non-SC population throughout the study.

86.9 percent. This indicates that the SC population is still lagging behind the Non-SC population as far as literacy rate are concerned.

Table 3.5. Composition of Occupation by caste

Industrial Categories of Main workers ⁵		SC	NSC
A and B	Cultivators	1.09	1.10
	Agricultural labourers	0.38	0.43
	Plantation, Livestock, Forestry, Fishing, and allied activities	0.71	1.13
	C	0.21	0.23
D	Household Industry	1.96	1.86
	Non Household Industry	13.85	15.21
	E	0.69	0.62
	F	13.70	7.00
	G	13.23	20.03
	H	1.46	2.10
	I	14.57	9.51
	J and K	10.11	17.31
	L to Q	28.04	23.48

Note: Industrial Categories A - Agriculture, Hunting and Forestry; B - Fishing;(Cultivators and agri.lr) C - Mining and Quarrying; D - Manufacturing (household and non household industry) ; E - Electricity, Gas and Water Supply; F - Construction; G - Wholesale and Retail Trade; H - Hotels and Restaurants; I - Transport, Storage and Communications; J - Financial Intermediation; K - Real Estate, Renting and Business Activities; L - Public Administration and Defence, Compulsory Social Security; M - Education; N - Health and Social Work; O - Other Community, Social and Personal Service Activities; P - Private Households with Employed Persons; Q - Extra-Territorial Organisations and Bodies.

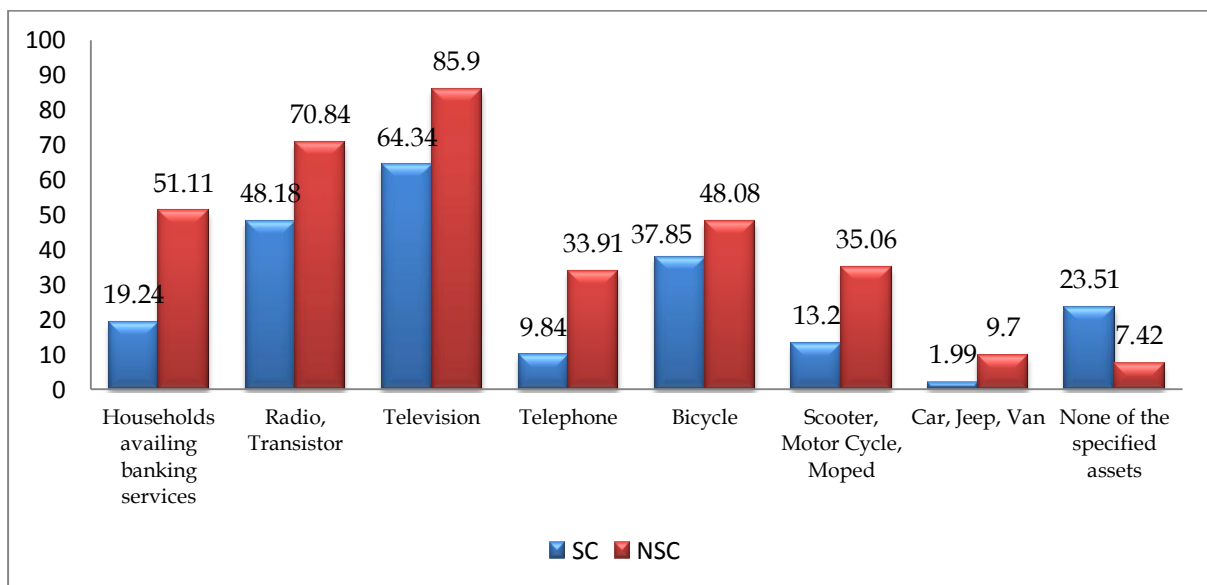
Source: Census of India, 2001

Table 3.5. depicts the occupational composition of the city's main workers by caste. As expected very few people in Chennai were engaged in the primary occupational categories A, B and C. There is no wide disparity in the occupational composition of the population by caste at this aggregate level. Nevertheless, we found some striking variations in some of the industrial occupational categories. There is a higher

⁵ As per the census 2001, those workers who had worked for the major part of the reference period (i.e. 6 months or more) are termed as Main Workers. Even though there is data on the occupational composition of marginal workers in the Census, it is not disaggregated by geographical unit, and we are therefore unable to provide that information here to complement the data on 'main' workers.

percentage of the SC population working in construction industry compared to the Non-SC population. This particular industry offers a large number of unskilled, manual and low paid jobs. And close to 14 percent of SCs in the city are employed in this sector. Some other industrial categories where SC population was well represented compared to the Non-SC population included Transport, Storage and Communications, Public Administration and Defence, Compulsory Social Security, Education, Health and Social Work, Other Community, Social and Personal Service Activities, Private Households with Employed Persons and Extra-Territorial Organisations and Bodies. Although it is difficult for us to estimate the actual nature of work being engaged in by both SCs and Non-SCs, much of the literature suggests that SC workers continue to work in manual and low skilled jobs (Anand 2010, Thorat and Despande, 2001)

Fig 3.1 Availing of Banking services and Ownership of assets by caste



Source: Census of India, 2001

Fig 3.1. depicts the availing of banking services and ownership durable assets by caste as per the 2001 census. The availing banking services and ownership of durable assets is usually considered as an indicator of the standard of living of the particular sets of population. From the below table suggests that as far as the ownership of durable assets is concerned, Non-SC households were better placed than the SC

population. While, more than half of the Non-SC population availed of banking services less than 20 percent of the SC population were availing of the same services. As far as the ownership of durable assets like Radios / Transistors , Televisions ,Telephones , Bicycles , Scooters / Motor Cycles / Mopeds and Cars / Jeeps / Vans, also was concerned, the Non-SC population's share remained consistently higher than that of the SC population.

This discussion of the socioeconomic status of the SC population has revealed through the 2001 census underlines that even after decades of social upliftment movements, targeted policies and reservations, the conditions of the SC population still lag behind those of the Non-SC population in the city.

3.4. Residential Segregation of SC population in the Colonial Madras

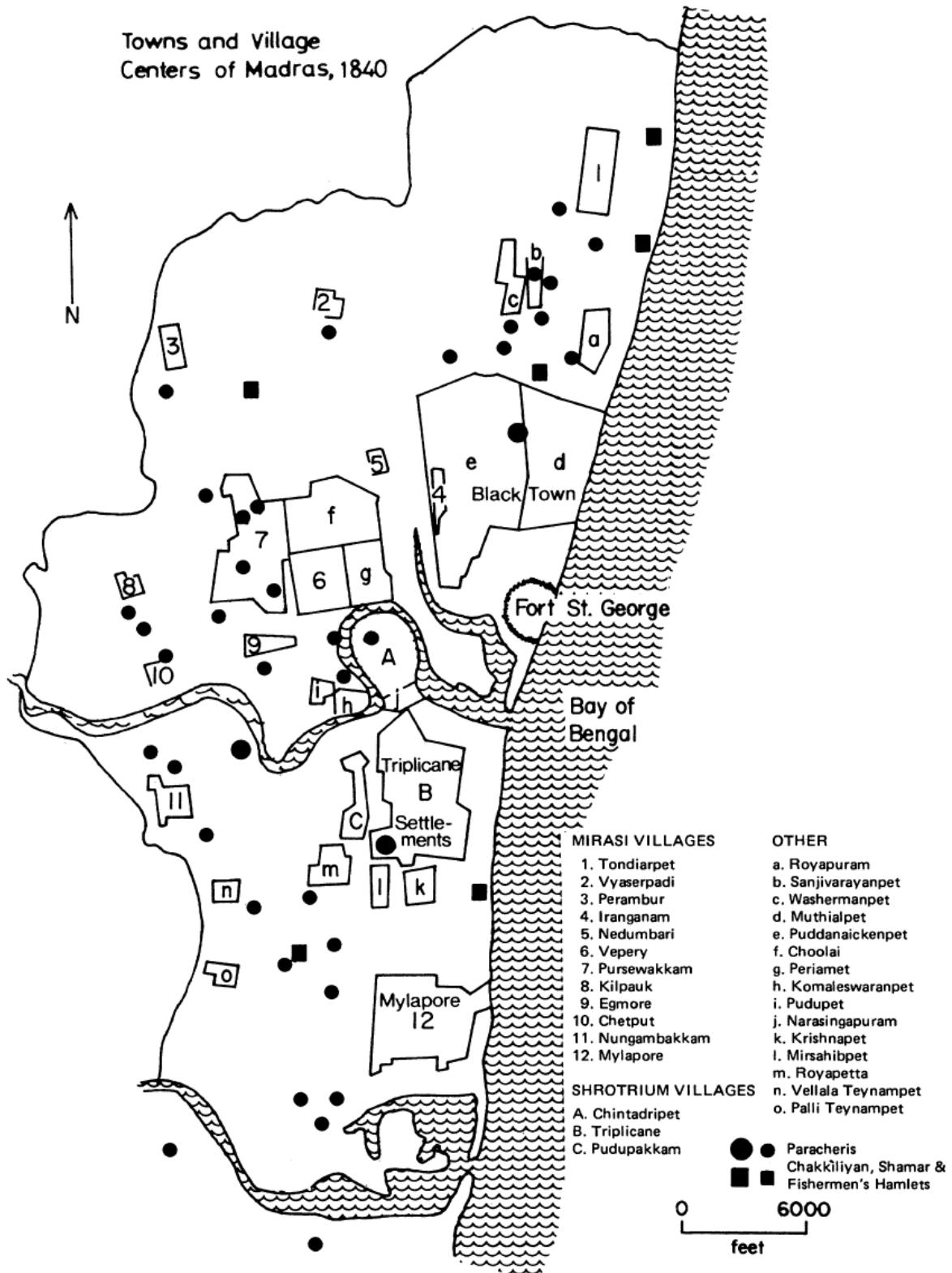
The Madras had been planned in accordance with a specific cultural, economic, social and spatial concern of the colonisers (Lewandowski, 1977). As a consequence colonial Madras was characterised by clear cut residential segregation between the spaces where the British lived and worked and those occupied by the local population. Further, within the settlements of the local population, there were streets inhabited solely by the particular caste groups (Nield, 1979). During the initial decades of colonial settlement, the town was segregated into three distinct areas, the Inner Fort enclosing the Factory House protected by four corner bastions connected by curtained walls; the European residential area or the White town protected by four corner bastions as well as walled on three sides located on the northern side of the Fort and the unprotected residential area or the Black town inhabited by the local population comprising weavers, traders, servants and artisans serving the Europeans (Roche, 1986).

Roche's further suggested that the caste segregation was "tolerated" and "even fostered" during the colonial rule for it favoured "the British commercial interests and values" (*ibid*: 381). As per the first imperial census in 1871, Madras was divided into 60 villages with distinct community identities as *mirasi* villages dominated by

rural *mirasi* elite (following *mirasi tenure* for agriculture), *non-mirasi* villages occupied by tenant-cultivators, labourers and artisans and *paracheris* (or squatter settlements) inhabited by 'untouchable' *Paraiyar* agricultural servants and village labourers (Nield, 1979). Map 3. 1 depicts the patterns of residential settlements in 1840.

The map shows clear demarcation of the residential location of each category of settlements. The *mirasi* villages are depicted by numerical digits and the *non-mirasi* villages and *shortrium* villages are depicted using small and capital English alphabets respectively. The *paracheris* are depicted by round black dots and the *chakkiliyan*, *shammar* and *fishermen* enclaves are indicated using black square boxes. The residential location was based on the individuals' caste-status, tantamount to their occupational status. One notable feature of this map is that the *paracheris* were spread throughout the city. The majority of the unskilled labour force in the city was constituted by the 'untouchable' population who lived in the *paracheris* located in the outskirts of the villages. Similar to other Indian villages, the 'untouchable' castes "were not welcome in the caste villages and urban neighbourhoods of Madras" (Nield, 1979: 227). Records indicate the existence of not less than forty identifiable *paracheris* within Madras by the 1830s (*ibid*). But the urbanism gaining pace within the city had little impact upon the horrendous lives of its inhabitants characterised by poor dwellings and public amenities coupled with blatant poverty and social exclusion. The 1871 census identifies 4,782,757 out-castes or other 'not recognised caste' population in the city.

Map.3.1. Towns and Village Centres of Madras, 1840

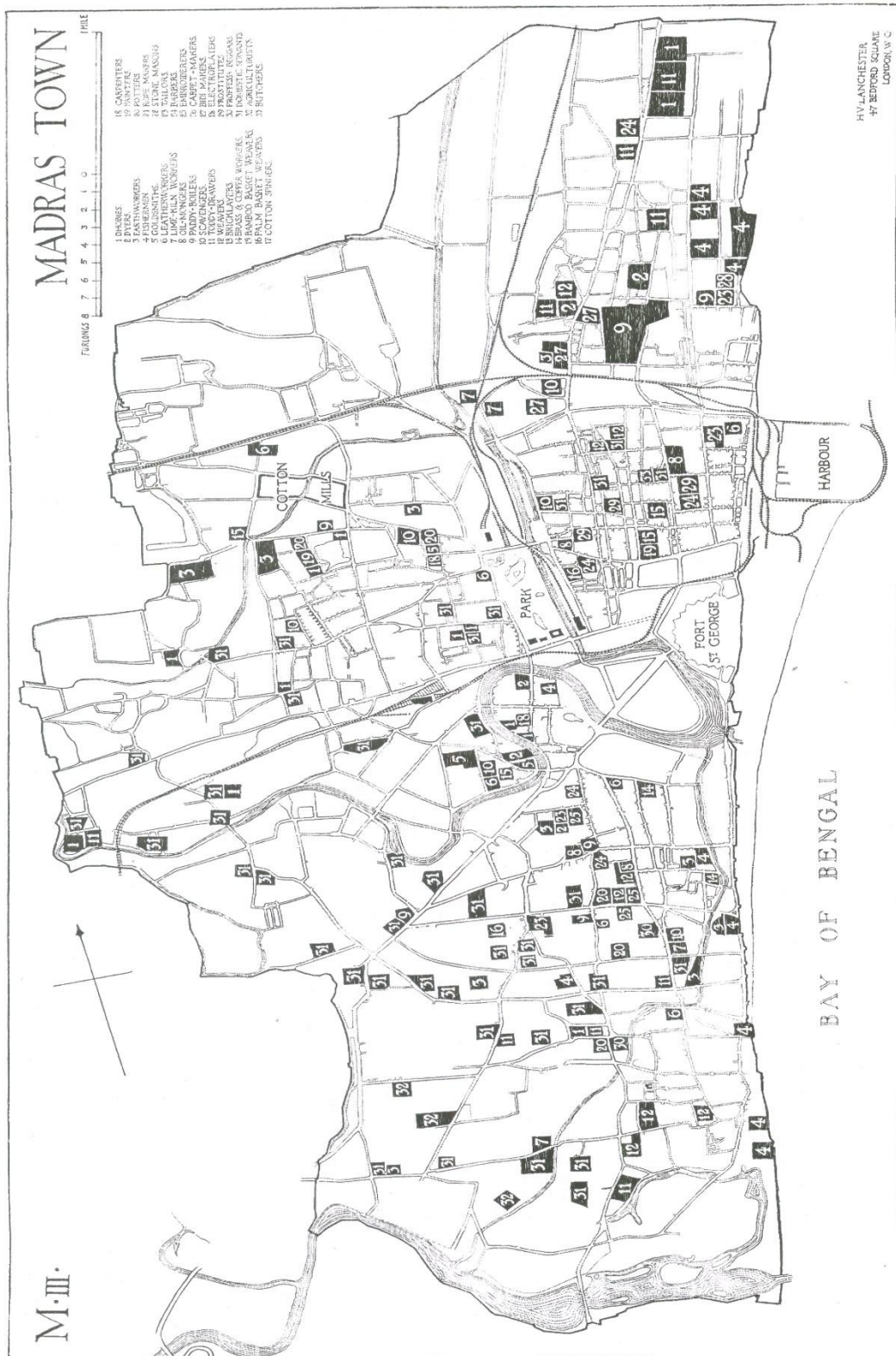


Source: Nield, 1979

In the later periods when Madras became urbanised, the spatial segmentation of the resident population remained more or less the same with different caste groups (or occupational groups) occupying definite areas, which formed distinct centres of industrial activity. The Madras city planner H. V. Lanchester found not less than 33 occupational sub-divisions of the city by caste as shown in the following Map. 3.2. Every caste had their hereditary, compulsory and endogamous occupational structure and the members of the same occupational group generally preferred to live in close proximity with the same caste group. Map 3.2. is an ideal illustration of the clustering of different caste group in a specific area. The different occupational groups are denoted by numerical numbers assigned to specific categories such as *dhobis* (washer men) indicated by 1, *dyers* by 2, *earth workers* by 3 and the like.

It is fascinating to note that, the vestiges of the old *agraharams* (Brahmin quarters), caste streets, cremation grounds, temples of patron goddesses of *mirasi* villages and *paracheris* buried under the modern streets and buildings have yet to be erased from the memory of the *vellalar* residents, who they can still recall their ancestral links to the pre-British Madras village they actually belonged to (Nield, 1979).

Map.3.2. Occupational sub-division of the city by caste, 1913



Source: Lanchester, 1918

3.5. Spatial Segregation of SC population in Chennai (1961 to 2001)

In this section, we are going to trace the spatial segregation experienced by the Scheduled Caste population in the metropolitan Chennai over the period of five census years i.e., from 1961 to 2001. This will help us to understand the changing levels of segregation over the years.

For this purpose, the municipal ward level population data have been compiled from the decennial census reports for 1961 to 2001 which is published via the Primary Census Abstract for the respective periods. There are two possible data sets for the computation of segregation index in the Indian context. One is the census block level data and the other is municipal ward level data. While census blocks are created for the specific purpose of census data collection, municipal wards are administrative units of a municipal corporation possessing definite geographical boundaries. Furthermore, the city-limits correspond to that of the municipal corporation frontiers (Vithayathil and Singh, 2011). Therefore we prefer to use the municipal ward level data for the analysis.

The census data do not provide any other advanced classification of population besides Scheduled Caste, Scheduled Tribe and other castes. For computation purpose, we have divided the population into two categories, SC and Non-SC including ST. The percentage of ST population has been historically low for Chennai city therefore identifying segregation for them would be a difficult process (see Table 3.2).

To facilitate a broader understanding of the spatial residential segregation of the SC population, we have used administrative maps of the city from different census years to depict the percentage of SC population in each ward of Chennai. Besides this we will be calculating the index of dissimilarity as a formal method to compute the residential segregation of the SC population in Chennai.

In the earlier section we came across maps (Map. 3.1. and Map 3.2.) depicting the residential location of the population on the basis of caste status, where in the residential pattern of the SC population was also visible. In the next four maps⁶, we will see the percentage of SC population in each census wards of the city. This will provide insight into the spatial pattern of SC residential concentration in the city during different periods.

In the following four maps, the symbols used to represent each category is one and same. Such as, the red dots represent the wards which have SC population of 45 percent and above; the yellow triangles denote the wards having SC population between 35 percent and 45 percent; the blue squares indicate the wards with SC population between 25 percent and 35 percent; the green pentagons represents those wards having SC population between 15 percent and 25 percent; those between zero percent and 15 percent are left without particular indication marks.

In this study, when we say about SC segregated wards, we mean those wards with SC population of 45 percent and above. From the Map. 3.3. we can understand that in 1961, there were three SC segregated wards, two of them in the manufacturing area and one in the old residential area. The majority of the wards having higher percentage of SC population lie on the northern side of the fort area which is the zone having more industrial and trade activity. The southern wards, which are predominantly residential areas, have a comparatively lower SC population relative to the northern region.

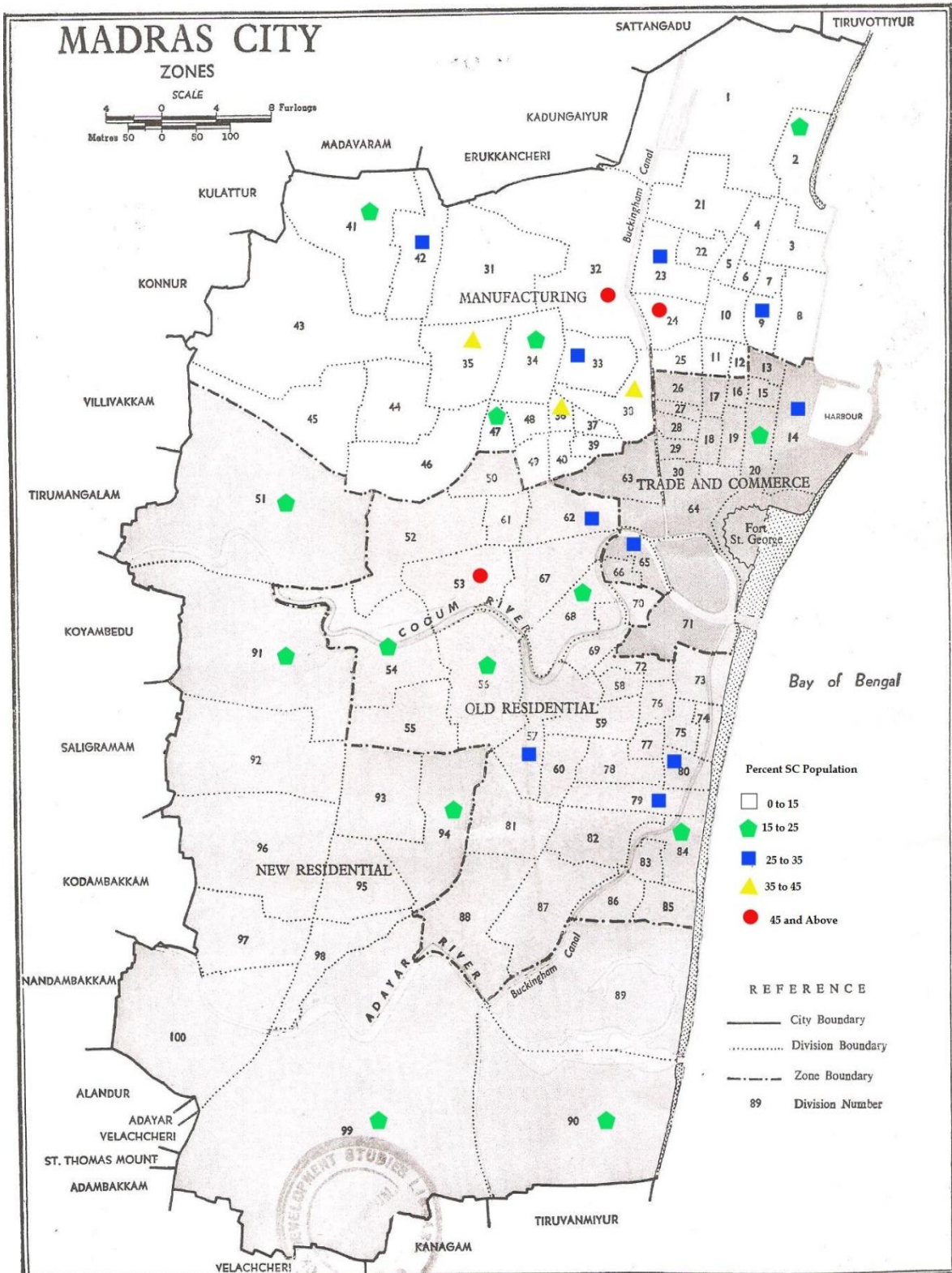
In 1971, we can notice from Map.3.4 that the concentration of the SC population in the city has reduced compared to that in 1961, which could be due to the overall fall in the SC population during the period (see Table 3.1). Also, we find that the

⁶ In the course of my M Phil work I was unable to find similar map for the year 1981.

concentration of SC population remains to be around the northern wards and the concentration seems to have reduced in the wards at the city limits.

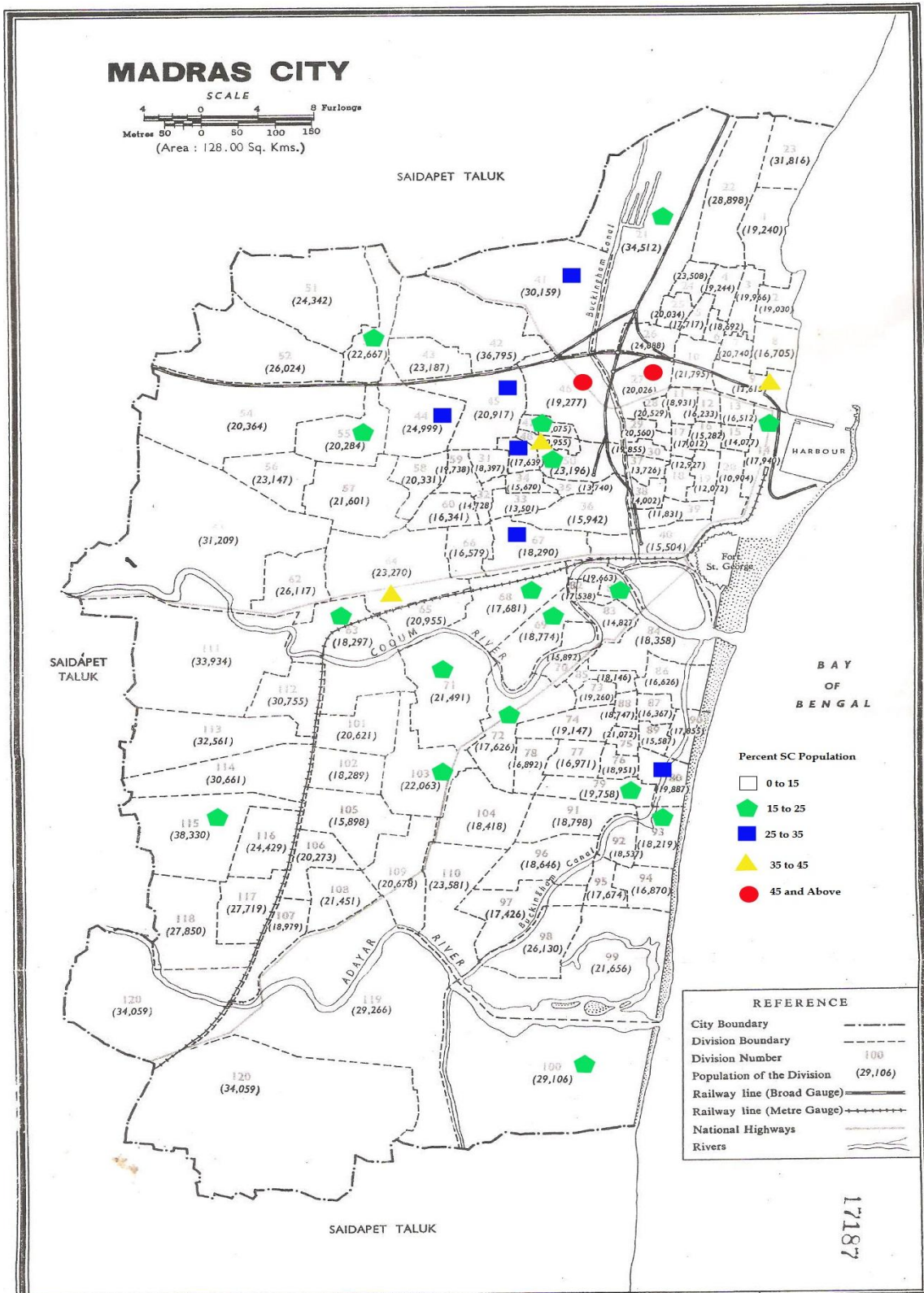
For the year 1991 depicted in the Map. 3.5, we are able to identify that the SC concentration had considerably changed from that of 1971. But the spatial patterning of SC concentration on the northern wards had not changed much and the concentration in the wards on the city limits had declined even further. The pattern is not very different for the year 2001 illustrated in Map. 3.6. However, the SC concentration has further declined in the wards on the city limits and increased for the northern wards.

Map 3.3. Percentage of SC population by wards in the Madras city (1961)



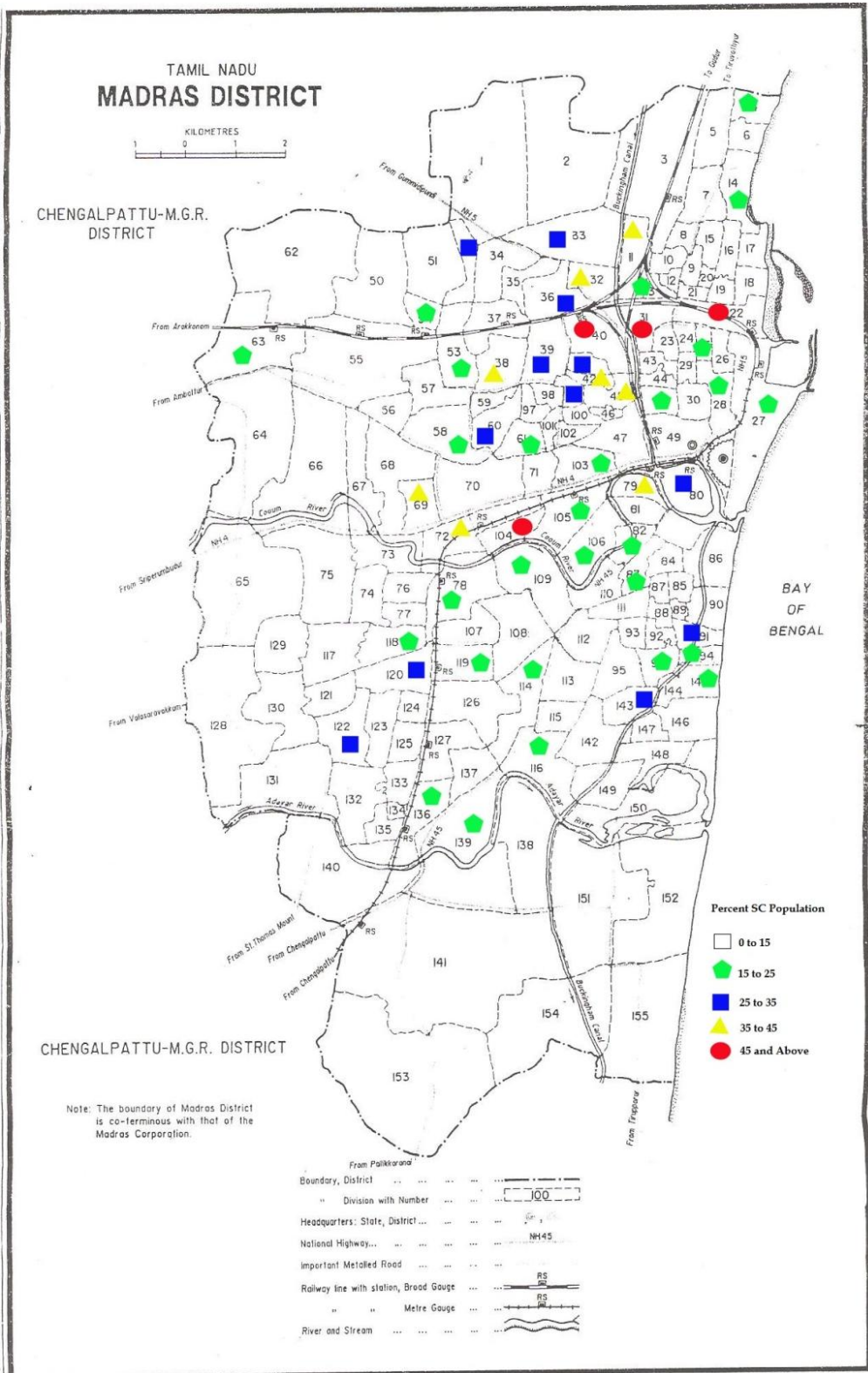
Source: Census of India, 1961

Map 3.4. Percentage of SC population by wards in the Madras city (1971)



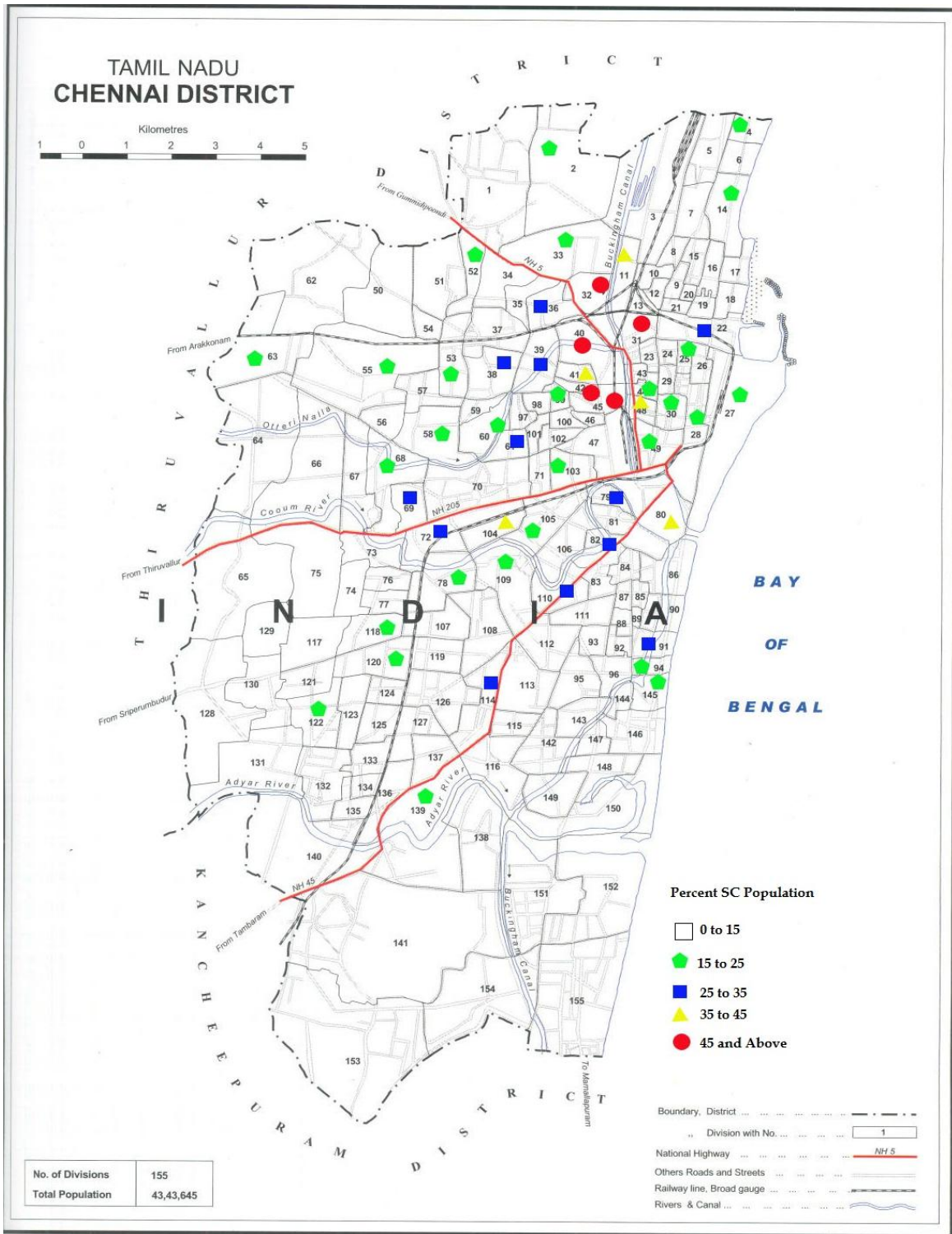
Source: Census of India, 1971

Map 3.5. Percentage of SC population by wards in the Madras city (1991)



Source: Census of India, 1991

Map 3.6. Percentage of SC population by wards in the Chennai city (2001)



Source: Census of India, 2001

The above maps permit us to make some inferences about the pattern of SC segregation. First, there is clustering of SC concentrated wards in the north of the city; a pattern which appears to have increased over the decades. Second, the concentration of SC population in the wards around the city limits has declined particularly in the south of the city.

3.5.1. The index of Dissimilarity (*D*)

In order to measure the levels of caste segregation in a more systematic and quantitative way, we have used the Index of Dissimilarity (*D*) put forward by Duncan and Duncan (1955). We chose this index not only for its ease of computation and interpretation but because it has stood the test of time and continues to be one of the most popular methods employed by researchers measuring residential segregation to this day (for instance, Roof, Valey and Spain, 1976; Farley, 1977; D' Souza, 1977; Telles 1992; Vithayathil and Singh, 2011). The index of dissimilarity is a measure of evenness, i.e., it measures how far the minority and the majority population are evenly distributed across an urban area. One of the major advantages of this index is that, *D* is mathematically independent of the racial composition of a metropolitan area (Massey and Denton, 1988) and despite various technical shortcomings like *checker board problem* which means that while calculating the index of dissimilarity, each administrative unit is considered in isolation from the others, thereby neglecting the overall social composition of its surrounding space and *comparability issues*, which issue occurs due to the changes in the spatial dimension of the same geographical area at different times which is often divided into administrative units in accordance with different criteria. Therefore comparative analysis can become unreliable as the neighbourhoods change at different time periods. *D* has shown close correlation with other indices that are considered technically far more superior (Massey and Denton (1955); cited in Logan, Alba and Zhang, 2002).

$$D = \frac{1}{2} \sum_{i=1}^N \left| \left(\frac{s_i}{S} \right) - \left(\frac{u_i}{U} \right) \right|$$

$$0 \leq D \leq 1$$

Where,

D is the index of Dissimilarity

s_i is the SC population of the *i*th municipal ward

S is the total SC population in the city

u_i is the non-SC population of the *i*th municipal ward

U is the total non-SC population in the city

The index of dissimilarity *D* may therefore be defined as the proportion of the minority population who would have to change their residential location so as to achieve the same spatial distribution as the majority population to which they are being compared (Duncan and Duncan, 1955). The value of *D* varies between 0 and 1, indicating no segregation and perfect segregation respectively.

Using the decennial census data from 1961-2001, the indices of dissimilarity among SC and Non-SC population of Chennai have been calculated in order to find the varying levels of residential segregation over the decades and the results are presented in Table.3.6.

Table.3.6 Indexes of Dissimilarity among SC and Non-SC populations for Chennai City (1961-2001)

Years	Index of Dissimilarity (<i>D</i>)
1961	0.400
1971	0.385
1981	0.400
1991	0.401
2001	0.342

The prior research which has employed the index of dissimilarity has differentiated residential segregation based on the value of *D*. When *D* fell between 0 to .30 it suggests a low degree of residential segregation, when it is between .30 to .60 a

moderate degree, and those above .60 a high degree of residential segregation (Massey and Denton 1987). Based on these standards the indices of dissimilarity calculated for Chennai in Table 3.6 do indeed suggest moderate levels of segregation of the SC population. During all the years 1961, 1981 and 1991, the levels of segregation among the SC population remained almost unchanged. Despite a small difference in the index of dissimilarity in 1971 which can reasonably be attributed to the overall decline in the percentage of the SC population (see Table 3.2). 2001 marked a more significant departure in the value of the index –with *D* moving closer to the ‘low’ category of segregation than to the ‘moderate’ category as delineated by Massey and Denton. This result can be further be interpreted as follows: during 1961, 1981 and 1991, at least 40 percent of the SC population would have been required to relocate in order ensure an even caste based distribution of population across the city. In 1971 and 2001, 38.5 percent and 34.2 percent of the SC population would have been required to relocate in order ensure an even caste based distribution of population across the city. In summation, the results presented in Table 3.6 suggest that residential segregation of the SC population in Chennai is beginning to witness a decline.

Hypothetically, when large scale suburbanisation takes place, the majority population (in this instance, Non-SC population) are most likely to move to the suburbs while the minority (i.e., the SC population in this context) would tend to move to the central city leaving the minority population even more segregated and isolated (Massey and Denton, 1987). If this hypothesis holds true, segregation should have been intensifying for SC population in the city as, Chennai has been experiencing intense suburbanisation over three decades (see Table 3.1). What then could be the reasons for the desegregation trend in the final decade?

3.6. The Rationales for the Recent Desegregation

We can explain recent desegregation using the theoretical perspectives on inter-urban variation in segregation (Massey and Denton 1985, Massey 1985, Massey and

Denton, 1987). Spatial assimilation of the minority group depended upon the extent of socioeconomic mobility and acculturation (which has been more studied in the case of immigrants)⁷ of the minority population, which could be mediated by the suburbanisation. When there is an improvement in the socioeconomic status of the minority population, they will try to improve their socioeconomic position often by relocating to areas that suit their newly enhanced status. In the course of doing this, they would probably move to areas populated by the majority group (in this instance Non-SC population) which possess better public amenities and facilities, thereby affording them with increased exposure to an interaction with the majority population hypothetically leading to higher residential integration (Massey and Denton, 1987). In summation, the higher the socioeconomic mobility of the minority population, the lower the spatial residential segregation. However, due to the lack of longitudinal data, we are not in a position to analyse this possibility within the limits of our study. One other factor that is important in determining residential segregation could be intra-city migration which could be taken into consideration here due to the unavailability of relevant data. Given these limitations, we look to other possibilities specific to Chennai which could explain the decline in segregation.

One such possible explanatory variable includes government intervention into the residential patterns of the SC population in the city. This government intervention took the form of urban development and housing policies during the period under consideration. As in the most other metropolitan cities in the developing world, Chennai is not devoid of slums⁸. According to the 2001 census, 45 per cent of

⁷ Acculturation can be defined as “those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original culture patterns of either or both groups” (Redfield *et al.*, 1936:149; cited in *The Cambridge Handbook of Acculturation Psychology*, 2006:11).

⁸ The Government of India Slum Areas (Improvement and Clearance) Act of 1954 defines a slum as “any predominantly residential area where the dwellings by reason of dilapidation, overcrowding, faulty arrangement, lack of ventilation, light or sanitary facilities or any combination of these factors are detrimental to safety, health or morals. In 1971, the Tamil Nadu Slum Clearance Board, drafting officials from Survey, Statistical, Revenue and Town Planning Departments then, conducted Socio-Economic survey of Madras Slums. For the purpose of the survey, a slum was taken to mean “hutting areas with huts erected in a haphazard manner without proper access, without protected water supply and drainage arrangements and so congested as to allow a little free flow of air to get in” (CMDA, Master Plan II, 2006).

Chennai's population lives in slums of which 19 percent are SC population. It is safe to assume that government interventions in the form of the demolition of slums and the resettlement of slum dwellers would certainly have impact on the residential pattern of SC population in the city. In order to address the problems of squatter settlements, steps were taken by the government even before the inception of the Tamil Nadu Slum Clearance Board (hereafter, TNSCB) in 1970 and the enactment of the Tamil Nadu Slum (Improvement and Clearance) Act in 1971. Prior to the TNSCB, in North Madras, the Corporation of Madras undertook slum clearance activities, in South Madras it was done by the City Improvement Trust and later on by the Tamil Nadu Housing Board (hereafter, TNHB). In the initial years, housing policies of the state had 'formal orientation' towards construction of *in situ* or As-is-where-is tenements while duly avoiding evictions and resettlement of slum dwellers which suited the priorities of the then ruling party, the *Dravida Munnetra Kazhagam* (DMK) (Raman, 2011). The intervention of World Bank funded urban-sector projects in the city during 1975 and the subsequent years brought about considerable changes in the housing policies of the city over the years. For shelter projects in the city, the World Bank favoured and insisted on the less costly relocation of slum-dwellers to "sites and services" developments⁹ rather than the costly *in situ* tenements followed by the TNSCB and TNHB. Even then, TNSCB continued with their construction strategy as before except for the specific projects funded by the Bank (*ibid*).

Nevertheless, during the mid-1980s witnessed massive slum evictions throughout the city, which was the aftermath of the implementation of the World Bank funded "City Beautification Scheme" (Viswesaran, 1988). For instance, in June 1986, the slum dwellers of the Wallace garden on Greams road; a posh area has been evicted and

⁹ Under this strategy, the slums resettlement and rehabilitation is done on the sites located outside the city, usually in the suburbs.

was resettled 20 km away at Kodingayur (*ibid*). In this way, a number of slum dwellers were evicted and slums demolished and resettlement sites were provided usually on the outskirts of the city.

From 1970 to 2004, TNSCB constructed 69, 594 tenements and TNHB constructed 10,423 slum tenements in Chennai (CMDA Master Plan II, 2006). Now, TNSCB is undertaking large scale resettlement and rehabilitation of slum dwellers in the objectionable areas to the city outskirts where land is available for such proposed projects. Some among such resettlement clusters set up by TNSCB include Semmencheri, Okkium Thoraipakkam (Kannagi Nagar) and Perumbakkam. In the same way, TNHB has also developed large neighbourhoods at Arignar Anna Nagar, K.K. Nagar, Ashok Nagar, Bharathi Nagar, South Madras Neighbourhood Scheme (comprising Indira Nagar, Besant Nagar and Sashtri Nagar), Thiruvanmiyur, Tambaram etc. TNHB has also developed Sites and Services Schemes under Madras Urban Development Project I (MUDP-I), under Madras Urban Development Project II (MUDP-II) and Tamil Nadu Urban Development Project (TNUDP) schemes funded by World Bank at Arumbakkam, Villivakkam, Kodungaiyur, Mogappair (East), Mogappair (West), Maduravoyal, Manali, Madhavaram, Ambattur, Avadi and Velachery (CMDA, Draft Master Plan II, 2006).

The detailed analysis of the government intervention in the form of Slum Clearance undertaken before and after the establishment of TNSCB as well as those done after the mid-1980s under various schemes by TNHB and TNSCB throws some light into the desegregation pattern during the recent period. In the initial years of slum clearance, the focus has been on the as-is-where-is settlements which left the settlement pattern of the SC population unaffected till the 1991 census. With the launch of City Beautification Scheme by World Bank during the mid-1980s changed the *in situ* shelter strategy to that of 'sites and service' strategy pushing the slum dwellers out of their actual squatter settlement sites to other areas within the city. Then again, more recently, due to lack of space within the city for such resettlement activities, those living in objectionable slum locations have been allotted tenements

outside the city where land is available for such projects. Therefore it could be concluded that due to the slum eviction and resettlement activities within the city started during the mid-1980s must have contributed to spatial redistribution of population within the city between 1991 and 2001 census years. The intra-city variations in the SC population concentration during 1991 and 2001 census periods confirm this argument. During 1991 and 2001, the percentage of SC population to the total population in the city has almost remained the same. In 1991, 12 of the Chennai municipal wards were having SC population below one percent and 4 wards were having SC population above 50 per cent, whereas by 2001, only one ward had below one percent SC population and 4 wards remained to have above 50 percent population. This intra-city redistribution of the SC population could have positively contributed to the desegregation trend during 2001 census.

3.7. Conclusion

From the above spatial and quantitative analysis we can say with some certainty that the spatial segregation of the SC population followed significantly the historical spatial patterning of the city. Further we were able to establish that much of the concentration of the SC population is along the northern wards of which is predominantly an industrial area city and, notably is in close proximity with the Black Town of Madras. This suggests that the possibility of job opportunities in manual and unskilled labour remains as one of the reasons for the distribution of SC population within the city. However, the almost stable index of dissimilarity begins to decline from 2001 onwards; moving slowly towards 'low levels of segregation'. Although we should point out that this should not be interpreted as a complete desegregation.

Chapter 4

Residential Segregation of SC population in Chennai - A micro-level Perspective

In the previous chapter, we examined the residential segregation patterns of SC population in Chennai at a macro scale and came to the conclusion that there still exists a moderate level of segregation within the city. Even though we also identified a slight desegregation trend in 2001, we cannot ignore that the city is still segregated. In addition, the index has shown only a very slight slowdown but not a complete desegregation.

In this chapter, we are going to take a closer look at the segregation phenomenon at a micro scale. The segregated neighbourhoods of a city usually possess their own unique attributes which motivated us to engage in a field survey that will bring out the specificities of these urban neighbourhoods, which are otherwise impossible to obtain through macro level data. A micro-level study of the SC segregated enclaves were planned and executed to get a ground level feeling of the geographical location, the socio-economic lives of the people, as well as the reason for segregation.

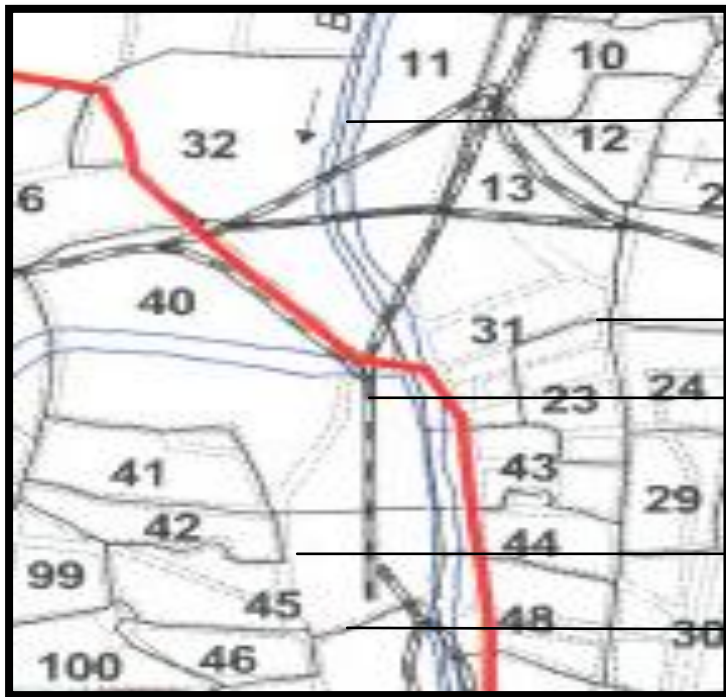
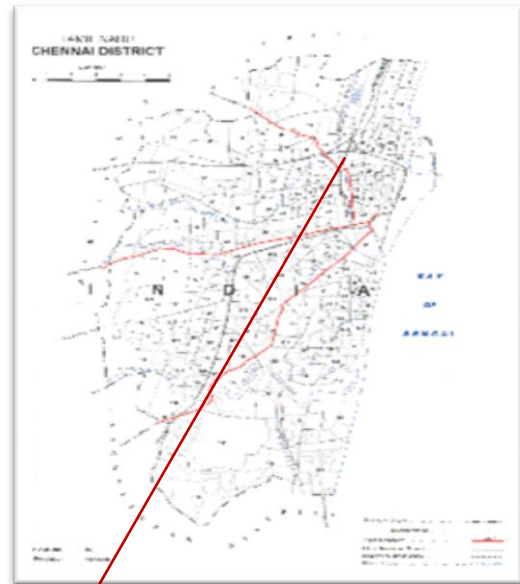
The chapter is organised in the following way. The first section of the chapter deals with the sampling methods. The second section gives a brief outline about the field. The third section is completely dedicated to the analysis of the data collected through the field survey and the chapter concludes with a LOGIT model on the discrimination of SC population in the city.

4.1. Sampling Method

The present study is intended to explore the macro and micro-level dynamics of residential segregation of SC population in Chennai. As mentioned earlier, by segregated wards we mean those wards with the SC population of 45 percent and above. After analysing the ward-level census data of Chennai city, we chose five wards having above 45 percent SC population. They were Basin Bridge (Ward 31); Vyasarpet or Vyasarpadi South (hereafter, Vyasarpadi; Ward 32)(footnote these

names interchangeably); Dr. Sathyavanimuthu Nagar (hereafter, Dr. S. Nagar; Ward 40); Besant Nagar (Ward 42) and Thattankulam (Ward 45) as per the 2001 census. Map 4.1 depicts the location of these wards in Chennai city in 2001. In keeping with the conclusions from our previous chapter, these sites were located or physically located to the northern part of Chennai; a predominantly industrial area.

Map 4.1 Chennai city wards selected for field survey



Vyasarpadi (South)

Basin Bridge

Dr. S. Nagar

Besant Nagar

Thattankulam

Table 4.1 shows that the SC population concentration on all the selected wards has been very high in the period under consideration compared to the total concentration of the SC population in the city in general. Thattankulam ward is a special case, whose SC population concentration was only 6 per cent SC population in 1961, which expanded dramatically to 50 per cent in 2001. In all the other wards, the percentage of the SC population tended to fluctuate between 31 and 58 per cent in the period under consideration. This table illustrates quite clearly why we chose these wards as the sites for the survey; but we would like to note that the higher concentration of SC households in these wards does not imply that these neighbourhoods were homogeneously populated by Scheduled Caste households.

Table 4.1. SC population distribution in the selected Chennai wards (1961-2001) in percentages

Wards	1961	1971	1981	1991	2001
Basin Bridge	52	46.3	56	58	57
Basant Nagar	43	42.3	47	44	53
Dr. S. Nagar	*	50.5	46	52	48
Thattankulam	6	16.8	25	42	50
Vyasarpadi	45	30.5	47	43	51
Chennai Total	12.38	10.49	13.36	13.79	13.77

Note: *data was unavailable for 1961

Source: Census of India, Various Years

Table 4.2. SC population distribution in the selected Chennai wards by gender (1961-2001) in percentages

Wards	1961			1971			1981			1991			2001		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Basin Bridge	52	48	52	51	49	46	52	48	56	51	49	58	50	50	57
Basant Nagar	53	47	43	52	48	42	51	49	47	50	50	44	50	50	53
Dr. S. Nagar	*	*	*	51	49	51	52	48	46	52	48	52	51	49	48
Thattankulam	52	48	6	52	48	17	51	49	25	51	49	42	50	50	50
Vyasarpadi	42	48	45	51	49	31	52	48	47	51	49	43	50	50	51

Note: M= Male; F= Female; T= Total

*data was unavailable for 1961

Source: Census of India, Various Years

Table 4.2. presents the gender distribution of the SC population. In all the selected wards except Vyasarpadi and Dr. S. Nagar, percentage of the male SC population was slightly higher relative to the female SC population in the period from 1961 to 1991. The only exception was in Vyasarpadi, where the percentage of male SC population was actually lower relative to the female SC population. By 2001, while the gender distribution of the SC population had more or less stabilised for all the wards under consideration, the male population still exceeded the female population slightly.

Once in the field, we fixed our sample size as 250 SC households and we adopted a purposive sampling method to select the households. As the census does not provide ward level data on the number of households occupied by the SC population, the number of households to be interviewed in each ward was selected as by taking 250 as a proportion to the SC population in each ward. We began our survey in areas that were predominantly SC neighbourhoods. The head of the family was selected as the primary respondent for the interview but in their absence, either their spouse or another older family member available in the household was selected as the respondent.

4.2. About the Field

Despite possessing a high concentration of SC population, the areas chosen for the survey varied drastically when it came to its physical settings, characteristics and the attitudes of the people. Hence we decided to consider these five wards separately throughout the analysis section, whereby we are expecting to come up with some interesting outcomes. The following paragraphs will give a brief outline of the physical attributes of the ward locations.

To start with, Basin Bridge is the confluence of the famous Buckingham Canal and Otteri Nullah. The survey had been conducted in some Housing Board Flats (which were allotted to the respondents as a part of the government slum clearance scheme) and the nearby enclaves where the SC population lived in clusters. We could

identify a number of Housing Board Flats which had been allotted by the government in the same area. Our second site was Besant Nagar, named after Anne Besant, which curiously is among the most affluent neighbourhoods in Chennai. This area was planned and developed by TNHB in the late 1970s and early 1980s. The most significant landmarks of this locality are Elliot's Beach (the end-point of Marina Beach, named after the British Governor, Sir Edward Elliot), the world famous Kalakshetra Academy and the Theosophical Society Headquarters. The Besant Nagar area is predominantly occupied by an affluent population, but it co-exists with slum-like settlements which are primarily SC neighbourhoods. The next site for the survey was Thattankulam located near Choolai (which was a *mirasi* village during the colonial period and now a separate ward). Thattankulam area was recently in the news for the alleged attack on SC students from this locality by eight people, six of them students, from another community (reported by IBN Live, Nov 04, 2011). Dr. S. Nagar, our fourth site is located near Pallavan Salai, and is famous for its urban slum in the locality which is amongst the largest slum in the city. Our fifth site was Vyasarpadi, an area having a long colonial history. It was one among the five new weaver villages¹ acquired by the British during 1708 in return for an annual rent of 1,500 pagodas from the Mughal Nawab, Daud Khan, by a *farman* (Srinivasachari, 1939). The village was organised under the *mirasi* system of tenure. The Map 3.1 shows the existence of *paracheri* in this locality as early as 1840. Just like any *mirasi* village, here also the SC population were forced to live outside the village boundaries.

4.3. Analysis of the Field Survey

The questionnaire gathered data on various dimensions of the respondents and their lives in the areas under study. In this section, we present the results of this survey; which will provide a basic understanding about the SC population in the segregated wards of the city, their standard of living and other aspects which are impossible to attain through macro-level datasets. This section has been divided into five subsections. In the first section, we analyse the sample household characteristics,

followed by a sub-section on social capital. The third sub-section deals with discrimination. The fourth sub-section is devoted for analysing the interrelationships between relevant socioeconomic variable. The section on analysis concludes with a Logit model on SC discrimination.

4.3.1. Sample Household Characteristics

In this sub-section on sample household characteristics, we have analysed the demographic profile of the household, socioeconomic attributes like education, income and standard of living. Other subjective aspects like the locational choice and relocation are also discussed. For the analysis simple statistical tools like percentages and summary statistics are used. A standard of index was calculated for evaluating the standard of living of the SC population in the SC concentrated wards.

Age Composition

Of the five areas surveyed, the age profile suggests that close to a fourth of respondents in Basin Bridge, Dr S. Nagar and Thattankulam were aged above 45 years of age; but that Thattankulam possessed by far the oldest population of respondents (more than 42 percent were aged above 45 years). In the Basin Bridge, Dr. S. Nagar and Vyasarpadi areas, the majority of the respondents also fell in 25-35 year bracket. Besant Nagar and Vyasarpadi possessed a much younger population (see table 4.3).

Table 4.3 Percentage distribution of the sample respondents by age (in years)

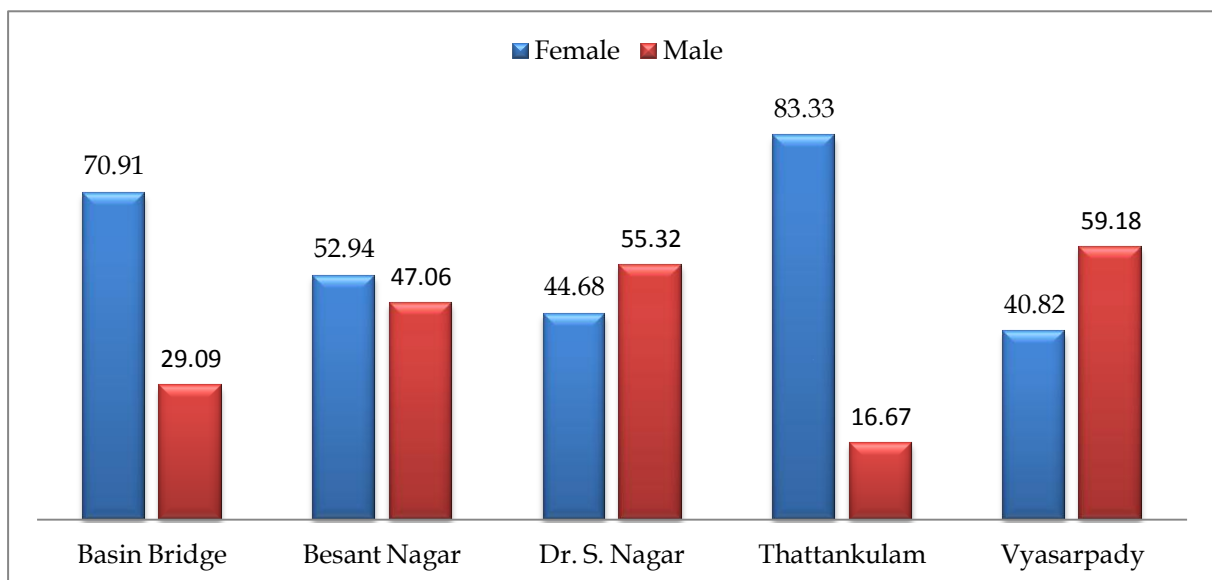
Age group (years)	Wards				
	Basin bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi
15-25	14.55	21.57	12.77	18.75	20.41
25-35	38.18	25.49	34.04	16.67	34.69
35-45	23.64	37.25	23.41	20.83	24.49
45-55	19.99	9.81	23.40	20.83	10.2
Above 55	3.64	5.88	6.38	22.92	10.2

Source: Primary Survey

Sex Composition

In the case of sex composition of the respondents to the questionnaire, except for Dr. S. Nagar and Vyasarpadi, the majority of the respondents were females. The census returns suggest that the gender composition of the SC population in all the segregated wards is almost equal (see Table 4.2). The difference in the sex composition could be accounted for by the timing of the interviews conducted in each ward. As mentioned in the sampling method section, the availability of the respondents determined the timing of the interview; therefore no generalisation can be reasonably arrived at based in the sex composition of the respondents.

Fig 4.1. Percentage distribution of the sample respondents by Sex



Source: Primary Survey

Marital Status

In all the five wards, the majority of the respondents were married. The highest percentage of single respondents was found at Vyasarpadi and the highest percentage of widow/widowers was found at Thattankulam. Both of these phenomena could be explained by the varying age distribution of respondents in these two areas, which has already been discussed.

Table 4.4. Percentage distribution of the sample respondents by Marital Status

Marital Status	Wards				
	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi
Single	5.45	9.8	4.26	4.17	12.24
Married	89.09	82.35	78.72	68.75	81.63
Widow	5.45	7.84	17.02	27.08	6.12

Source: Primary Survey

Data on other demographic indicators were also captured. For instance, we found that the average household size for all the five wards was found to be 4-6 members. The average number of children studying in the household was found to be two for Basin Bridge and Besant Nagar, one for Dr. S. Nagar and Thattankulam, and zero for Vyasarpadi.

Educational Qualification

The highest educational qualification attained by any of the family member in a household for the five localities is given in Table 4.5. Although the educational qualification of the head of the family varies markedly between the wards, it is evident that majority of the population possess low level of education (below matriculation level) and very few completed graduation or post graduation.

Table 4.5. Percentage distribution of the sample respondents by Educational Qualification

Educational qualification	Wards				
	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi
Illiterate	60	9.8	27.66	54.17	24.49
Below Matriculation	18.18	70.59	51.06	39.58	63.27
Matriculation	16.36	13.73	14.89	4.17	8.16
Pre-degree /Plus Two	3.64	5.88	2.13	2.08	0
Graduation	1.82	0	2.13	0	4.08
Post-graduation	0	0	2.13	0	0

Source: Primary Survey

Here we could also notice that unlike other wards, only Dr. S. Nagar, was represented in all the categories of educational qualifications. Besant Nagar has the least percentage of illiterate population (9.8 per cent) while Basin Bridge had the

highest percentage of illiterates (60 per cent). Besant Nagar and Thattankulam appeared the worst off; as there was no representation of these two neighbourhoods in the higher education category (graduation and above).

Occupational Structure

From the below table it is clear that there is stark variation in the occupational status of the people in different localities. Most of our SC respondents appear to work manual jobs, with Thattankulam with 68.75 per cent of the population topping the list followed by Basin Bridge (45.45 per cent), Dr. S. Nagar (44.68 per cent), Vyasarpadi (40.82 per cent) and Besant Nagar (29.42 per cent). Besant Nagar has the highest percentage of population occupied in government menial and contract jobs while a significant percentage of the population also held jobs in the private sector. In Basin Bridge and Thattankulam, SC respondents do not appear to work government, menial and contract jobs and very few were represented in the private sector (5.45 percent and 4.17 per cent respectively).

One noteworthy result was the presence of Manual Scavenging as an occupational choice among the SC population in these wards. Manual scavenging involves sweeping the streets and manually engaging in carrying night-soil. Recently, the National Human Rights Commission termed manual scavenging as one of the worst violations of human rights. Despite this, we found 8.33 per cent of the population in Thattankulam engaged in scavenging followed by Basin Bridge (3.64 per cent), Dr. S. Nagar (2.13 per cent), Besant Nagar (1.96 per cent) while none in the Vyasarpadi area worked in this sector; which may be explained by the fact that the SC population in Vyasarpadi was very well-represented in the non-farm self-employment (48.98 percent). Non-farm self-employment was also well represented in Basin Bridge (34.55 percent), Dr. S. Nagar (31.91 per cent), Besant Nagar (25.49 per cent) and Thattankulam (18.75 per cent).

Table 4.6. Percentage distribution of the sample respondents by Occupational Structure

Occupation	Wards				
	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi
Government Menial Jobs	0	21.57	2.13	0	2.04
Private Job	5.45	21.57	14.89	4.17	6.12
Household Industry	10.91	0	4.26	0	2.04
Non-farm Self Employment	34.55	25.49	31.91	18.75	48.98
Manual Labour	45.45	29.41	44.68	68.75	40.82
Scavenging	3.64	1.96	2.13	8.33	0

Source: Primary Survey

In short we may say that in the occupational distribution of the five areas were not uniform. Relatively, Dr. S. Nagar had better representation in all the occupational categories while Besant Nagar had a higher percentage of population working in permanent jobs than any other locality. Among the five localities under consideration, Thattankulam is in the worst condition as the majority of its inhabitants are occupied in low paid manual jobs. We would like to conclude by mentioning that when respondents were asked whether household members were still following their 'traditional occupation', whatever that may be, none of them returned a positive answer. But when asked about the occupational status of the earning members in the household, such occupations as *kalvelai* and *drum beaters at funeral* which are traditional occupation of the SC population were quoted.

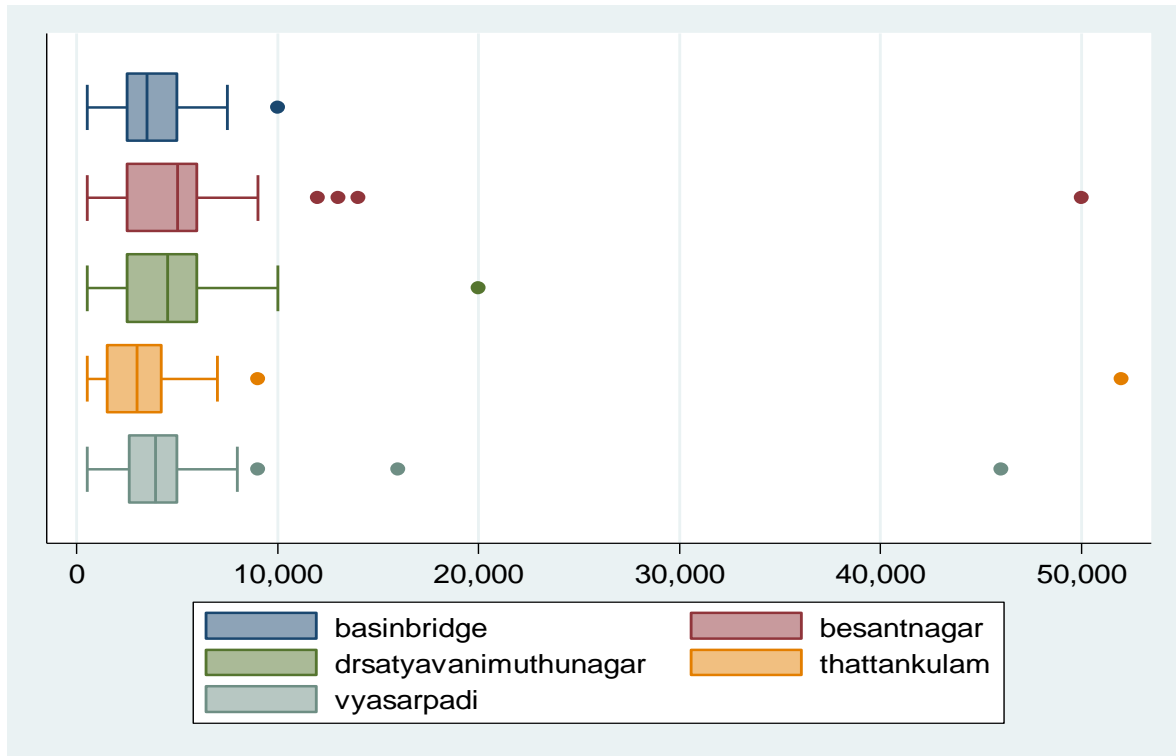
Income Distribution

Table 4.7. Household Income Distribution

Summary Statistics	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi	Total
Mean	3783.64	5870.59	4738.30	4166.67	5024.49	4705.6
Median	3500	5000	4500	3000	3900	3900
SD	1886.58	6921.77	3470.85	7292.01	6492.32	5596.61
CV	.499	1.18	.733	1.75	1.29	1.19
Kurtosis	3.65	33.82	9.08	40.25	33.95	50.23
Skewness	.721	5.24	1.96	6.05	5.36	6.31

Source: Primary Survey

Fig 4.2. Average Income (in Rs.)



Source: Primary Survey

Figure 4.2 shows the box plot for household income distribution which is a graphical representation based on the ordered statistical summaries of median and quartiles. Those data sets that are difficult to analyse using histograms could be easily interpreted using box plots. Therefore box plot is a good alternative or complement to a histogram that enables several simultaneous comparisons.

From the table we find that the median income is highest in Besant Nagar (Rs. 5000/person) and lowest at Thattankulam (Rs.3000/person). Comparing the means produce different ordering except for highest mean income (Rs. 5870.59/ person) at Besant Nagar. The lowest mean income is found to be at Basin Bridge.

The average income is higher than the median incomes in all regions. This means that there exist some households whose average monthly income is much higher than the others which pulls up the average income level as a whole and suggests a

far more unequal income distribution than that can be captured by basic statistics. This has resulted in very high positive skewness with respect to the income of these regions. From the Fig 4.1, there is clear indication of far lying outliers in almost all the areas under the study, which has influenced the results in a massive ways. The standard deviation which measures variation tells that the income in the Thattankulam region varies the most and basin bridge the least.

Duration of stay in the locality

The duration of stay was used as a proxy to estimate how comfortable population felt in their place of residence/how uncomfortable they might have felt moving out of their place of residence. The responses also allow us to estimate the historical settlement patterns as well. From table below it is clear that for all the areas under investigation, the majority of the SC respondents had been living in the same locality for a fairly long period; these neighbourhoods were not established overnight. The majority of the households in these areas were inherited by the current residents. Only at Thattankulam (22.32 per cent) and Vyasarpadi (2.04 per cent), were we able to find families who have lived less than 10 years in the current locality. This could be due to the presence of a higher proportion of rented households at Thattankulam (70.83 per cent) and Vyasarpadi (93.88 per cent).

Table 4.8. Duration of stay in the locality (in percentages)

Length of Residence	Wards				
	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi
Below 5 years	0	0	0	6.25	0
5-10 years	0	0	0	16.67	2.04
Above 10 years	7.27	21.57	8.51	18.75	16.33
Ancestral home	92.73	78.43	91.49	58.33	81.63

Source: Primary Survey

Reason for current residential location

Respondents' answers to questions regarding their reasons for residing in the areas under consideration give us some insight into whether they chose to live there due

to the familiarity factor, because they wanted to live in a homogenous neighbourhood or whether other variables of forces drove their decision making.

Table 4.9. Reasons for residential locational choice

Reasons for locational choice	Wards				
	Basin Bridge	Besant nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi
SC majority area	18.87	21.57	23.40	12.50	5.00
Easy access to job location	38.18	33.33	15.22	0	0
Low rent	4.58	9.02	19.41	9.3	76.06
Long years of Stay/ Ancestral House	18.00	34.00	39.53	57.69	14.29
No accessibility to better places	20.37	2.08	2.44	20.51	4.65

Source: Primary Survey

The table shows that the major reason for the current place of residence is the long years of stay/ancestral household. Except in Vyasarpadi, a fair number of households chose to live at their present place of residence because it was the SC majority area. Another reason indicated by the SC respondents except in Thattankulam and Vyasarpadi is the ease of access to their current job location. Low rent has been attributed as a major reason for choosing current residential location by the SC households in Vyasarpadi. As mentioned earlier, this could be due to the presence of area a very large number of rented households in this area. Almost 20 percent of the SC respondents in Basin Bridge and about 21 percent in Thattankulam area chose to reside in the area as they were constrained by limited accessibility to better places and the reason they gave us was their poor financial condition.

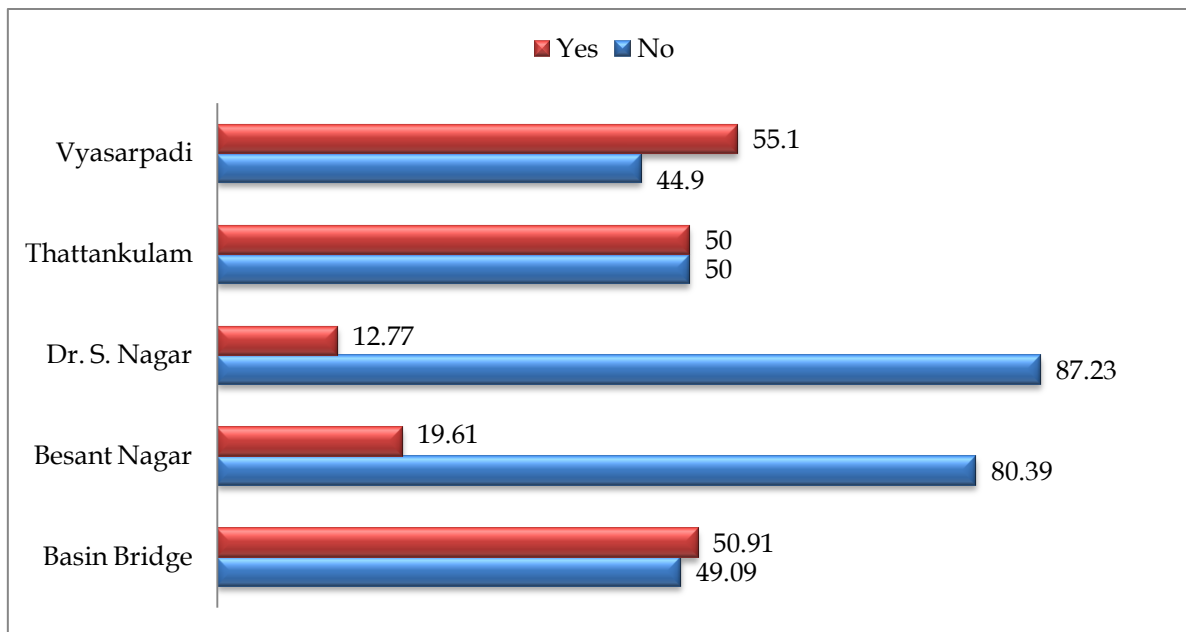
Willingness to relocate

The willingness to relocate from the current place of residence has various urban planning and policy implication with respect to the segregation issue. The desegregation of a particular set of population is dependent upon the willingness of the people to relocate from the current place of residence. In this section, along with

the willingness on the part of the population to relocate, we will also deal with the reasons cited by the residents for relocation or non-relocation.

The willingness to relocate has been found at high percentage among the residents of Vyasarpadi (55.1 per cent), Basin Bridge (50.91) and Thattankulam (50 per cent) localities where as only (19.61 per cent) at Besant Nagar and (12.11 per cent) at Dr. S. Nagar were willing to relocate.

Fig 4.3. Willingness to relocate (in percentages)



Source: Primary Survey

The reasons cited for relocation at Basin Bridge were lack of amenities (82.14 per cent) and lack of household space (17.86 per cent). At Thattankulam, people were willing to relocate due to lack of public amenities (100 per cent). However the case of Vyasarpadi locality is bit different from the other areas. Here, the majority of the people were willing to relocate due to unsafe neighbourhood (62.96).

The unwillingness to relocate from the current area of residence in all the five areas was either due to comfortable neighbourhood or easy job accessibility from the locality.

Standard of Living

One of the major determinants of the welfare of a person depends upon his or her standard of living. The standard of living varies with the social class in which an individual falls and as social class has strong correlation with the caste-status of an individual, we are interested in knowing the living standards of the people of the segregated neighbourhoods. This attains particular importance as the population living in these segregated enclaves fall in the lower strata of the society. A Standard of Living Index (hereafter, SLI) has been computed to measure the living standards of the people living in these segregated wards.

The SLI is computed from the following scores, which were added together and divided by the number of questions, in this case it was equal to 7.

Type of house: Pucca = 1; Kuccha = 0

Ownership of the household: Owned = 1; Rented = 0

Availability of electricity connection: Yes = 1; No = 0

Availability of toilet facility in the household premise: Yes = 1; No = 0

Access to drinking water: Yes = 1; No = 0

Ownership of Ration card: Yes = 1; No = 0

Type of Ration card held: APL = 1; BPL = 0

SLI= Type of house + Ownership of the household+ Availability of electricity connection + Availability of toilet facility in the household premise + Access to drinking water+ Ownership of Ration card+ Type of Ration card held

7

Table 4.10 shows that the distribution of the SLI is of almost similar range between the wards. However, in the case of Thattankulam it seems to have clustering in the initial classes, indicating a low SLI.

Table 4.10. Class Interval-wise Distribution of SLI

Class Interval	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi	Total
0 - .1	0	0	0	0	0	0
.1 - .2	9.09	1.96	0	4.17	10.20	5.20
.2 - .3	0	0	0	0	0	0
.3 - .4	10.91	7.84	4.26	6.25	28.57	11.60
.4 - .5	10.91	1.96	10.64	18.75	18.37	12
.5 - .6	0	0	0	0	0	0
.6 - .7	16.36	33.33	12.77	14.58	18.37	19.20
.7 - .8	23.64	23.53	29.79	39.58	12.24	25.6
.8 - .9	0	0	0	0	0	0
.9 - 1	29.09	31.37	42.55	16.67	12.24	26.40

Source: Primary Survey

The standard of living index is highest for Dr. S. Nagar (.733) and lowest at Vyasarpadi (.472). The medians are the same at .714 for all the regions except Vyasarpadi (.429). There is not much variation between the mean and median SLI.

Table 4.11. Standard of Living Index (SLI)

Summary Statistics	Wards					Total
	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi	
Mean	.629	.669	.733	.631	.472	.626
Median	.714	.714	.714	.714	.429	.714
SD	.270	.195	.197	.220	.222	.238
CV	.430	.291	.269	.349	.471	.379
Kurtosis	2.046	3.124	2.525	2.669	1.988	2.260
Skewness	-.258	-.565	-.484	-.194	.316	-.276

Source: Primary Survey

The median standard of living index is lower than the median in all regions suggest negative skewness. The standard deviation which measures variation tells that the standard of living index Besant nagar region varies the least while Basin Bridge varies the most.

Public Amenities

The provision of public amenities in an area is usually influenced by the type of its neighbourhood. Therefore computing the PAI would give insights into the type of the community living in those areas. The availability of proper public amenities is an indicator for the kind of unequal treatment that the public authorities is showing to the people belonging to these poor caste enclaves in the city. Therefore we calculated a Public Amenities index where by the people were asked to rate in a 0 to 4 scale of poor to excellent the public amenities being provided in their locality. The public amenities taken under consideration are Public transport system, Public health service, Water supply, Electric supply and Sewage supply.

The PAI has been computed from the rank scores of the following:

The public amenities, i.e., Public transport system, Public health service, Water supply, Electric supply and Sewage supply has been rated using a scale of 0 to 4 i.e., Poor = 0; Fair = 1; Average = 2; Good = 3 and Excellent = 4. The maximum score for a single individual can have will be 20 (4 × 5). Therefore after adding up the individual ranking for amenities, the score thus obtained will be divided by 20 of which the average will be computed for each ward to get the final index score.

Table 4.12. Class Interval-wise Distribution of PAI

Class Interval	Wards					
	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi	Total
0 - .1	0	0	0	0	0	0
.1- .2	0	0	0	0	0	0
.2 - .3	0	0	0	0	0	0
.3 - .4	0	0	6.38	0	8.16	2.80
.4 - .5	1.82	0	46.81	14.58	91.84	30
.5 - .6	38.18	19.61	46.81	81.25	0	36.8
.6 - .7	60	64.7	0	4.17	0	27.2
.7 - .8	0	15.69	0	0	0	3.20
.8 - .9	0	0	0	0	0	0
.9 - 1	0	0	0	0	0	0

Source: Primary Survey

The distribution of PAI ranges between 0.2 and 0.7. Of which Besant Nagar is clustered between 0.5 and 0.7 classes and Vyasarpadi remains between 0.3 and 0.4 classes

Table 4.13 Public Amenities Index (PAI)

Summary statistics	Wards					Total
	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi	
Mean	.524	.574	.412	.472	.366	.472
Median	.55	.6	.4	.5	.35	.5
SD	.037	.051	.044	.049	.034	.086
CV	.071	.090	.108	.105	.094	.183
Kurtosis	4.004	2.300	3.328	3.868	4.079	2.250
Skewness	-1.280	-.256	-1.035	-1.232	-.903	-.051

Source: Primary Survey

The PAI is highest for Dr. S. Nagar (.733) and lowest at Vyasarpadi (.472). The medians are the same at .714 for all the regions except Vyasarpadi (.429).

The mean standard of living index is lower than the median in all regions suggesting negative skewness. The standard deviation which measures variation tells that the standard of living index Besant nagar region varies the least while Basin Bridge varies the most.

4.3.2. Discrimination

Traditionally, SC population has been considered one among the most discriminated population in the Indian scenario. The mere presence of them was considered 'polluting' and untouchability was practiced against them at some point in the Indian history. But today they situation is supposed to have changed as a result of the deliberate efforts by the government of India by way of abolishing untouchability and incorporating specific laws for the protection of the right of the SC population in the country. However, in a 2007 report by the committee on the Elimination of Racial Discrimination suggested rampant SC discrimination being taking place within the urban as well as rural India. It is quite shocking to note that

even today, there is the prevalence of job market discrimination against the educated SC population in the urban India (Thorat *et al*, 2001, Chakravarthy and Somanathan, 2008). Therefore, in an area where there is residential segregation of the SC population exists, we doubted for the existence of discrimination in the name of caste in these areas. This was also necessary for us to have the perspective of other sections of population in the community towards the SC population as well as to check the strength of the social norms among the population. The people were asked several questions such as whether they have been discriminated against at work place, educational institutions or denied of public or private services due to caste status as well, whether the caste status has been a barrier to their job mobility or social mobility was also asked.

Discrimination Effect Index (DEI)

A Discrimination Effect Index (DEI) has been calculated so as to find the extent of discrimination suffered by the SC s in these segregated enclaves. The DEI has been computed by adding up the following scores which are divided by the number of questions, in this case being 4 to get the DEI of an individual.

- Denied of public/private services due to caste status: Yes = 1; No = 0
- Victim of caste discrimination at work place: Yes = 1; No = 0
- Victim of caste discrimination at educational institutions: Yes = 1; No = 0
- Hampering of Social or Job mobility due to caste status: Yes = 1; No = 0

$$\text{DEI} = \text{Denied of public/private services due to caste status} + \text{Victim of caste discrimination at work place} + \text{Victim of caste discrimination at educational institutions} + \text{Hampering of Social or Job mobility due to caste status}$$

$$\frac{\hspace{10em}}{4}$$

The index score will vary between 0 and 1. The more it approaches one, higher the discrimination effect and vice versa.

Table 4.14. Class Interval-wise Distribution of DEI

Class Interval	Wards					Total
	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi	
0 - .1	20	58.82	65.96	2.08	97.96	48.40
.1- .2	0	0	0	0	0	0
.2 - .3	0	0	0	0	0	0
.3 - .4	25.45	35.29	17.02	22.92	2.04	20.80
.4 - .5	0	0	0	0	0	0
.5 - .6	25.45	5.88	17.02	39.58	0	17.6
.6 - .7	0	0	0	0	0	0
.7 - .8	0	0	0	0	0	0
.8 - .9	29.09	0	0	35.42	0	13.2
.9 - 1	0	0	0	0	0	0

Source: Primary Survey

From the distribution table (4.14) we can infer that except for Thattankulam and Basin Bridge, the majority population is clustered at the first class with 0 as the value, which means they are less likely to have suffered discrimination. For Basin Bridge (29.09) and Thattankulam (35.42 per cent) of the population is at as high a value as 0.8.

Table 4.15. Discrimination Effect Index (DEI)

Summary statistics	Wards					Total
	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi	
Mean	.409	.118	.128	.521	.005	.239
Median	.5	0	0	.5	0	.25
SD	.278	.153	.194	.205	.036	.273
CV	.679	1.3	1.521	.394	7	1.141
Kurtosis	1.689	2.813	2.560	2.202	47.021	2.074
Skewness	-.144	.907	1.090	-.387	6.784	.700

Source: Primary Survey

The DEI scores were found to be high for the people living in Thattankulam (0.521) and Basin Bridge (.409) compared to the other regions especially Vyasarpadi, which shows a score 0.005

4.3.3. Social Capital

Caste is considered to be one among the most important social capital in India. The fundamental idea of social capital is that “ one’s family, friends, and associates constitute an important asset, one that can be called upon in a crisis, enjoyed for its own sake, and/or leveraged for material gain” (Woolcock and Narayan, 1999). The castes are considered valuable social capital that can promote entrepreneurial development as well as a positive driver for overall development of the economy (Teltumbde, 2010). The communities that are endowed with a varied stock of social networks and civic associations possess better power to tackle poverty and vulnerability (Narayan, 1995) and the *absence* of social ties have equally adverse impact. The social capital also considered a driving force for segregation. Therefore, to find the social capital possessed by the individuals of this community at different localities we have computed a Social Capital Index using the following method.

Social Capital index (SCI)

The SCI has been computed using the following scores. First, these scores are added together and then divided by the number of questions; in this case it is 4. This will give us individual level SCI score.

Presence of caste organisation in the locality: Yes = 1; No = 0

Membership in the caste organisation: Yes = 1; No = 0

Presence of SHGs/ Microfinance institutions in your locality: Yes = 1; No = 0

Feeling of safety and comfortability in same caste neighbourhood: Yes = 1; No = 0

SCI = Presence of caste organisation in the locality+ Membership in the caste organisation+ Presence of SHGs/ Microfinance institutions in your locality+ Feeling of safety and comfortability in same caste neighbourhood

Table 4.16. Class Interval-wise Distribution of SCI

Class Interval	Wards					Total
	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi	
0 - .1	0	0	59.57	0	53.06	21.60
.1 - .2	0	0	0	0	0	0
.2 - .3	0	0	0	0	0	0
.3 - .4	29.09	70.59	40.43	14.58	46.94	40.40
.4 - .5	0	0	0	0	0	0
.5 - .6	70.91	29.41	0	85.42	0	38.00
.6 - .7	0	0	0	0	0	0
.7 - .8	0	0	0	0	0	0
.8 - .9	0	0	0	0	0	0
.9 - 1	0	0	0	0	0	0

Source: Primary Survey

The distribution of SCI table (4.16) suggests that, at Vyasarpadi (53.06 per cent) and Dr. S. Nagar (59.57 per cent) majority of the population enjoy no SCI at all while that at Basin Bridge (70.91 per cent) and Thattankulam (85.42 per cent) of the population possess moderate 0.5 level of Social Capital.

Table 4.17. Social Capital Index (SCI)

Summary Statistics	Wards					Total
	Basin Bridge	Besant Nagar	Dr. S. Nagar	Thattankulam	Vyasarpadi	
Mean	.427	.324	.101	.464	.117	.291
Median	.5	.25	0	.5	0	.25
SD	.115	.115	.124	.089	.126	.189
CV	.268	.356	1.227	.192	1.074	.649
Kurtosis	1.848	1.817	1.152	5.028	1.015	1.798
Skewness	-.921	.904	.39	-2.007	.123	-.280

Source: Primary Survey

Table 4.17 suggests that Thattankulam (0.464) and Basin Bridge (0.427) possess more Social Capital compared to other areas, the lowest of which is at Dr. S. Nagar (0.101). At the Basin Bridge and Thattankulam it is highly negatively skewed while that at Besant Nagar it is highly positively skewed.

4.3.4. Interrelationships

In order to find the interrelationship between the socioeconomic variables of the household, we have carried out tests for measuring the association between the relevant variables. For the purpose, Pearson's Chi-square test and Cramer's V were made use of. The Pearson's Chi-square test, also known as the goodness of fit test is a test for independence between two variables.

Cramer's V is usually used as a post-test to determine the strengths of association after the chi-square significance determination. It is interpreted as a measure of the relative (strength) of an association between two variables. The coefficient ranges from 0 to 1 (perfect association). The Cramer's V values above 0.5 represent high association, 0.3 to 0.5 represent moderate association, 0.1 to 0.3 represent low association and 0 to 0.1 represent little if any association

In our analysis, a number of variables were selected to check their association with other variables. For instance, we checked the association of the sex of the household head and the education he/ she possesses. And a null hypothesis was formulated that there is no association between the sex of the household head and his or her educational qualification. The result suggested that (see Table 4.) the Pearson's chi-square is not significant at 5 percent or 10 percent significant levels therefore we accept the null hypothesis that there is no association between the sex of the household head and his or her educational qualification. As also the Cramer's V (0.1800) is also showing little if any association between the sex of the household head and his or her educational qualification.

Likewise, we found the association of sex of the household head and the kind of occupation in which he or she is employed. The null hypothesis was that there is no association between the sex of the household head and the kind of occupation in which he or she is employed. The result suggested that (see, Table 4.18.) the Pearson's chi-square is significant at 5 percent significant levels therefore we reject the null hypothesis that there is no association between the sex of the household

head and the kind of occupation in which he or she is employed. Cramer's V (0.6531) for the association between the sex of the household head and the kind of occupation in which he or she is employed indicates high level of association between the two variables.

Table 4.18. Measures of Association

Variables	Pearson Chi-squared			Cramer's V
	df	Chi2	Pr	
Sex by education	5	8.0987	0.151	0.1800
Sex by occupation	7	106.6508	0.000**	0.6531
Marital status by occupation	14	43.8254	0.000 **	0.2961
Education by occupation	35	52.7156	0.028 **	0.2054
Occupation by income	21	27.9541	0.141	0.1931
Occupation by SCI	10	17.3088	0.068*	0.1861
Household size by SLI	24	32.2881	0.120	0.1797
Type of ration card by income	3	111.5160	0.000 **	0.6679
Earning members education by occupation	20	132.8904	0.000**	0.3345
No. of earning members by income	9	229.8438	0.000 **	0.5536

Note: p** < 0.05; p* < 0.10

Source: Primary Survey

Just the same way, the association between variable were tested for marital status of the head of the household and occupation, education and occupation of the head of the household, occupation and income, occupation and SCI, type of the ration card and the income of the household, number of earning members by income as well as for the earning members education and occupation. The result suggested the association of occupation of the head of the family and SCI at 10 percent significance. Except for household size and SLI and sex of the household head and education all the other variables were strongly associated with each other at 5 per cent significance levels.

4.3.5. Logit Model: Explanation for the Discrimination of SC population

In the previous sections of this chapter we discussed the various characteristics of the SC households in the segregated neighbourhoods and the statistical association between some of the important variables. As we are intended to find the

socioeconomic outcomes of the residential segregation, discrimination faced by the SC population in the society demands special attention. In order to further establish this point, we had included questions on the frequency and extent of discrimination faced by the SC population in these five segregated localities, and found that 55 percent of the people had suffered discrimination in one form or the other till date. For the purpose we are proposing a Logit regression model to analyse the extent of caste based discrimination faced by the SC population inhabiting the segregated neighbourhoods. The Logit regression or Logit analysis introduced by Joseph Berkson in 1944, is a uni or multivariate technique used to estimate the probability that an event occurs or not, by predicting a binary dependent outcome from a set of independent variables.

It is generally believed that SC people attaining higher education and better occupational status could command respect and will not have to face caste based discrimination in the society. Therefore, we are considering education of the most educated member in the household and occupational status of the head of the family as two among the independent variables in our model. Gender discrimination has been a sub-field of extensive research throughout the world. Hence we found it relevant to include the sex of the household head to be used as a predictor for analysing SC discrimination in the segregated neighbourhoods of the city. We assume that as the household size increase there are more chances of exposure to discrimination and so we considered it as one among the predictors in our analysis.

In our analysis we are using Logit model for predicting the odds for SC discrimination in the SC segregated wards of the Chennai city and therefore our dependent variable is whether the SC segregated neighbourhoods experience caste based discrimination or not.

Usually, the segregated neighbourhoods characterised by lesser public amenities (indicating discriminatory practices from the public authorities) and low standard of living compared to affluent neighbourhoods. In our study, we are assessing this

using the Public Amenities Index (PAI) and Standard of Living Index (SLI) computed using the data collected from the primary survey. Therefore we are including them with the other predictors. Social capital is supposed to be one reason for the formation of ethnic enclaves and we have Social Capital Index (SCI) for calculating it. This also forms one among our predictors for the model. As the physical settings of the wards we analysed differed drastically between the wards, in order capture this variation in our analysis, we incorporated dummy variables for each region and used them along with the other predictors.

In the model, our dependent variable is SC Discrimination (Y_i). The dependent variable takes value '1' if a respondent household reports to be experiencing discrimination and '0' otherwise. The explanatory variables for our model are:

EDU= education of the most educated member in the household

OCCU=occupation of the head of the family

GEND=sex of the household head

HHS= Household size

PAI=Public Amenities Index (PAI)

SLI= Standard of Living Index (SLI)

SCI= Social Capital Index (SCI)

D1, D2, D3, D4= Regional dummies

As we consider five regions, we use four regional dummies as follows:

$D_1 = 1$ for Basin Bridge and 0 otherwise

$D_2 = 1$ for Besant Nagar and 0 otherwise

$D_3 = 1$ for Dr. S. Nagar and 0 otherwise

$D_4 = 1$ for Thattankulam and 0 otherwise

The model intercept will account for the fifth region Vyasarpadi, the base region.

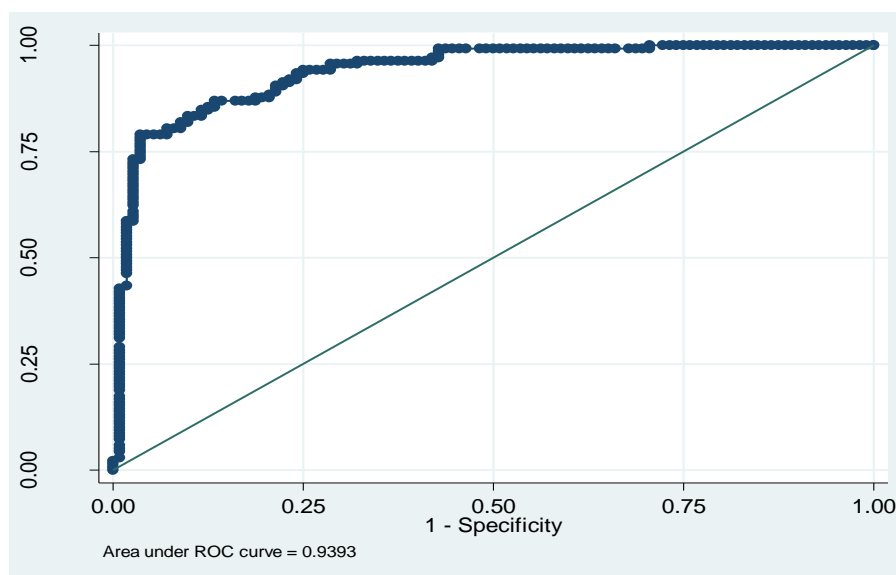
The total number of observations used in the analysis is 250.

$$Y_i = \beta_1 + \beta_2 \text{EDU} + \beta_3 \text{OCCU} + \beta_4 \text{GEND} + \beta_5 \text{HHS} + \beta_6 \text{PAI} + \beta_7 \text{SLI} + \beta_8 \text{SCI} + \beta_9 \text{D}_1 + \beta_{10} \text{D}_2 + \beta_{11} \text{D}_3 + \beta_8 \text{D}_4 + U_i$$

The estimated model shows that a one unit change in independent variables will increase the log odds of the dependent variable SC discrimination by its Logit, controlling for all other independent variables. Nevertheless, the difficulty in grasping the magnitudes of the effects in a logarithmic scale makes the interpretation of the Logit coefficients of the dummy variables insufficient to interpret the model (Alba 1987; cited by Zhou and Logan, 1991). The odds ratio in the result can be defined as the ratio of the probability of occurrence of an event to that of non occurrence. The value of the odds ratio varies between 0 and infinity.

We will start the explanation of the model with Receiver Operating Characteristic or ROC curve analysis. The ROC curve analysis is a method widely used for evaluating the logistic regression models. ROC curve analyses the power of the model's predicted values to discriminate between the positive and negative cases, which is quantified by analysing the Area under the ROC curve (AUC- Area Under Curve). The AUC or the c-statistic (or concordance index), is a value which varies between 0.5 (representing a worthless test) and 1.0 (representing a perfect test).

Fig 4.4. ROC Curve



Next we have the model discrimination test, which evaluates the ability of the model to distinguish between the two groups of cases, based on the estimated probability of the event occurring. Table 4. 19. shows 86.80 per cent of the cases to be correctly classified. Further, the ROC curve (Fig.4.4.) which measures the accuracy of the test, gives the area under the ROC curve to be 0.94, which rates the accuracy of the test to be excellent.

Table 4.19. Model Discrimination Test

		True		Total
		1 (D)	0 (~D)	
Predicted	1 (+)	120	15	135
	0 (-)	18	97	115
Total		138	112	250

**Classified + if predicted $\Pr(D) \geq .5$
True D defined as discrimination $\neq 0$**

Sensitivity	$\Pr(+ D)$ 86.96%
Specificity	$\Pr(- \sim D)$ 86.61%
Positive predictive value	$\Pr(D +)$ 88.89%
Negative predictive value	$\Pr(\sim D -)$ 84.35%
False + rate for true ~D	$\Pr(+ \sim D)$ 13.39%
False - rate for true D	$\Pr(- D)$ 13.04%
False + rate for classified +	$\Pr(\sim D +)$ 11.11%
False - rate for classified -	$\Pr(D -)$ 15.65%
Correctly classified	86.80%

Source: Primary Survey

Pseudo R^2 is a measure of goodness of fit which is used to quantify the proportion of explained 'variation' in the logistic regression model. In the present model, Pseudo R^2 is 0.5499 suggesting the model to explain almost 55 percent of the variation. Table 4.20. shows the Logit variables predicting the SC discrimination in the segregated wards of the city. The result suggests that the SLI and SCI variables significantly (at less than 5 percent level) increase the log odds of SC discrimination in the segregated SC neighbourhoods. Note that PAI is marginally significant. All the other variables except the dummy variables for Dr. S. Nagar and Thattankulam are found to be statistically insignificant in predicting the SC discrimination in the segregated wards

of the city. The SLI and SCI variables are statistically significant in determining the residential segregation of the SC population. It means that as the SLI and SCI increase, there is all possibility of increased SC discrimination to take place. We expected education and occupation to have a negative significance on the SC segregation. However, both the variables were found to be insignificant in explaining residential segregation of the SC population. The statistical significance of locality dummies suggests the importance of residential location in determining segregation of the SC community.

Table 4.20. Results of the Logit model

Independent Variables	Co-efficient	P> z	Odds Ratio
EDU	-0.51 (0.29)	0.079	0.599
OCCU	-0.02 (0.17)	0.904	0.979
GEND	-0.61 (0.73)	0.403	0.545
HHS	-0.25 (0.28)	0.369	0.775
PAI	9.12 (4.65)	0.050	9103.661
SLI	2.52* (1.00)	0.012	12.469
SCI	6.34 ** (1.76)	0.000	565.548
<i>Regional Dummy Variables</i>			
L 1	-0.07 (0.99)	0.946	0.935
L 2	0.94 (1.06)	0.378	2.555
L 3	-3.07 ** (0.95)	0.001	0.047
L 4	-4.36 ** (1.31)	0.001	0.013
_const	-4.43 (2.60)	0.088	
Log Likelihood	-77.392799		
LR chi2(11)	189.08		
Pseudo R ²	0.5499		
Prob > chi2	0.0000		
N	250		

Note: Standard error in the parenthesis; p* < 0.05; p** < 0.01

Source: Primary Survey

4.4. Conclusion

The major conclusions that we may draw from the analysis section is that the SC population in the segregated wards are unique in themselves. They possess different levels of incomes, occupational structure and residential locational preferences. But a strikingly common thing is the lower educational qualifications, high representation in the unskilled and low paid jobs, lower average income and lower social capital in these segregated enclaves. The SLI and PAI are also not on the higher end. Many of the people belonging to SC community prefer relocation. However, due to adverse financial conditions act as a hindrance for their residential mobility. Finally, with the Logit model we identified SLI and SCI as the possible predictors for SC discrimination.

Chapter 5

Summary and Conclusion

5.1. Introduction

The issue of residential segregation is a widely discussed and extensively researched area in the urban and population studies literature in the Western world. This issue has gained so much importance in the US that residential segregation patterns of different population groups have been estimated and included in the national census¹⁰.

In India, religious and migrant ghettos are still common in many parts of the country. But when we raise the question of caste-based residential segregation, especially with reference to the lower caste population in the metropolitan cities, many still consider that such segregation is still a rural problem, and not one that is found in the urban agglomerations. This attitude may explain why the residential segregation of the SC population and its impact on the segregated population have been little discussed in the Indian context. Except for some sociological and ecological studies, few attempts have been carried out in this area. This study has been an attempt to fill this gap in the literature.

We have chosen the neoclassical framework for discussing the residential segregation of the SC population in the city. Focussing on the social identity of the SC population derived from their caste status, the historical residential patterns and the strength of social norms, we explain the reasons for the present residential segregation and its implications on the socio economic lives of this segregated population.

¹⁰ US Census website URL:

http://www.census.gov/hhes/www/housing/housing_patterns/pdftoc.html

5.2. Spatial Residential Segregation of SC population in Chennai

Our first objective was to trace the spatial segregation experienced by SC population in Chennai. As a first step in determining the spatial pattern of residential segregation of the SC population, various historical and contemporary maps were studied and specific patterns in the residential segregation of the SC population in the city were identified. The SC population historically tended to cluster in the northern wards of the city which is now predominantly an industrial area. It has also been noted that these enclaves are in close proximity with the area that used to be known as Black Town in the colonial Madras. From this pattern, we can assume the possible predominance of the SC population in the manufacturing and allied industries, which was later validated by the 2001 census data.

In order to estimate the residential segregation of the SC population, the index of dissimilarity has been utilized. The results suggested moderate levels of segregation in the city throughout the period under consideration i.e., from 1961 to 2001. However, the result attains importance due to two reasons. Firstly, Tamil Nadu has been one amongst the first states in the country to have organised SC upliftment or anti- Brahmin movements known as The Dravidian Nationalist Movement or the Self-Respect Movement in 1925, so as to end the oppression of the SC population by the Brahmins. Despite having such a long history of SC upliftment movements, the persistence of caste-based residential segregation is definitely a cause for worry. However, the segregation scale has shown a slight decline in 2001 compared to the earlier years. It fell from a persistent 0.40 in 1981 and 1991 to 0.34 in 2001. The shocking revelation is that this decline in segregation was not due to the upward mobility of the scheduled caste, rather it was perpetuated by the large scale slum evictions done under the name of World Bank funded *City Beautification Scheme* since the mid-1980s. The slum dwellers were evicted and resettlement tenements were offered not *in situ* but on the outskirts of the city. This suggests in all possibility, that the recent desegregation of the SC community which constitute almost 19 percent of

the population of the slum dwellers could be attributed to the rapid slum evictions and resettlements after the 1990s.

The population thus evicted are nowadays being resettled in the peripheral areas of the city reducing the segregation within the limits of the city. Nonetheless, we cannot expect a complete desegregation through this method as even today, the ecological structure of the city continues to reflect its historical past. Even the population in the segregated enclaves are not willing to relocate from their current place of residence either due to their ancestral links with the residential location or due to the job accessibility of the present location. In a recent Report by the Committee on the Elimination of Racial Discrimination, 2007, it was noted that government programs for the SC housing continue to maintain the existing patterns of spatial segregation which had been in the past dictated by upper caste 'tradition'. From this study, we may argue the same for Chennai.

5.3. Impact of residential segregation on the segregated SC population

Our second objective had been to assess the impact of spatial segregation on the socio-economic conditions of the SC population in the city. It has been a difficult task due to the unavailability of specific data from the census or any other official or unofficial data bases. Hence, we conducted a field survey on the sites of some of the most segregated neighbourhoods of the city, where the SC population comprised more than 45 percent of the total ward level population. Due to the distinct and diverse physical attributes and social attributes of the wards, we went on to analyse the issue at the smallest scale possible, i.e., ward level. The analysis has provided us with some striking results.

The micro level study in the five segregated wards of the city opened up a new dimension to our study. The average income of the households in all the wards were more or less positively skewed indicating the presence of one or two high income households within the segregated enclaves. The Public Amenities Index (PAI), Social Capital Index (SCI), Discrimination Effect Index (DEI) and Standard of Living Index

(SLI) calculated for different wards also varied among the wards. As expected, these caste enclaves were poor neighbourhoods with limited access to basic amenities, poor standard of living, and poor educational qualifications and inhabitants worked in low class occupations. However, the range of these attributes varied between the wards. For analysing the possible determinants for SC discrimination in the segregated regions, we used a Logit model taking SC discrimination as the dependent variable. The independent variables used in the model were education of the most educated member in the household, occupation of the head of the family, sex of the household head, household size, Public Amenities Index (PAI), Standard of Living Index (SLI), Social Capital Index (SCI) and the regional dummies. In the Logit analysis we found that the SCI, SLI and two regional dummies were statistically significant variables which determined the discrimination of the SC population in the city. The insignificance of the other variables like education and occupation denoted its insignificant influence on the SC discrimination.

As per our analytical framework, we considered residential segregation as the result of individual preferences for a specific location based on the perceived caste status of an individual by himself as well as the population belonging to other caste groups, the strength of the traditional, religious and cultural stigma attached to the particular group of population and the historical residential pattern of the concerned social group. However, our field research revealed that even after nearly six decades of extensive urbanisation and two decades of economic liberalisation, the SC population remains residentially segregated at certain quarters of the city. However, unlike the earlier arguments, the process of residential segregation has not been entirely dictated by the caste status of the community, rather the residential segregation can be considered the end result of comparatively limited choices available to the people belonging to this community which can further be linked to the socioeconomic status of this population group. Many respondents in the Vyasarpadi area disclosed their non-preference to stay in the SC concentrated area due to lack of safety. But they are compelled to stay in the locality due to the unaffordability of better options elsewhere in the city. The major departure from the

existing literature in this field is that it may not always be the sense of belonging to the same community or the sense of safety living with the same community that drives the choice to live in the segregated neighbourhoods.

5.4. Future Research

As mentioned in the beginning, the research on the residential segregation in India is still in its infancy. There is ample scope for future research in this area. In the present study, we concentrated only on the residential segregation pattern of a specific community for a single city. It would be a worthwhile effort to undertake a comparative historical segregation pattern of two or more cities and attempt to trace the segregation based on other aspects such as social class or religion. Another extension of caste-based residential segregation could be the one studying the relative segregation dynamics of a central city and its suburbs. There exists a wide research gap studying the impact of residential segregation in any of its form in the Indian cities and towns.

5.5. Conclusion

The study on Chennai's residential segregation has many important revelations on the spatial residential pattern of the SC population in the city, the importance of the city's historical past in influencing its present residential pattern, and its socio economic implications on the lives of the segregated SC population. The present study has enabled us to make some generalised conclusions about the residential pattern and its impact on the socioeconomic lives of the segregated population in the city.

Firstly, there has been the persistence of caste-based segregation in the city for a very long time and it suggests its possible continuation in the future. However, the slight desegregation trend that has been found is more unlikely to be the natural outcome of social assimilation of the lower caste population, rather it can be attributed to the government policies intended to make the city free of slums. This is much less likely

to result in gradual, complete desegregation of the city; but rather will set up new enclaves at another location. In this instance, it will be the city outskirts provided for sites and service developments. Here, we suggest that the increase in the decadal variation in the populations in Thiruvallur and Kancheepuram districts which is linked to the influx of non-Tamil labours from around the region and from other states by Singh (2011), our study indicates the possibility that it could be due to the resettlement of the SC population to the suburban areas as a part of the City Beautification Scheme in Chennai that had contributed to such a trend.

Secondly, the persistence of this caste based segregation could be the combined effect of the self attributed social identity, the perceived social identity, the historical residential pattern and the continuance of the strong social norms that has dictated the particular type of residential segregation that we are witnessing in Chennai.

Thirdly, as ecological studies suggest, the spatial patterning of Chennai city is complex and cannot be equated with the classical models which are largely applicable in Western cities. We could find the co-existence of poor neighbourhoods alongside the affluent neighbourhoods in many quarters of the city. Finally, the caste-status remains a significant factor influencing the socioeconomic outcomes of the individuals.

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Appendix 1

Table A. 1. Classification of 'Hindoo' Population in the Madras Presidency, 1901

Caste Names	Population
Priests	1,095,445
Warriors	190,415
Traders	714,712
Agriculturists	7,826,127
Shepherd and Pastoral Castes	1,730,681
Artisans	785,085
Writer or Accountant Castes	107,652
Weavers	1,071,781
Labourers	3,944,463
Potmakers	250,343
Mixed Castes	714,233
Fishermen	971,837
Palm cultivators	1,664,862
Barbers	340,450
Washermen	524,660
Others	2,666,890
Out castes	4,761,503
Total	29,361,139

Source: Imperial Census of India, 1901

Appendix 2

Dynamics of Residential Segregation among the Scheduled Caste Population in India: The Case Of Chennai, 1961 - 2001

M Phil Dissertation at Centre for Development Studies (CDS), Thiruvananthapuram under Jawaharlal Nehru University (JNU), New Delhi

Questionnaire for Field Survey

I. Household Characteristics

1. Name:
2. Age:
3. Sex:
4. Current marital status:
5. Religion: Hindu/Sikh/Parsi
6. Caste:
7. Educational qualification:
8. Occupation:
9. Type of house: thatched/ tiled/ concrete
10. Ownership of house: Rented/ Own
11. No: of members in the family:
12. Monthly family income:
13. Details of the earning members:

No.	Educational qualification	Occupation	Nature of industry/ occupation	Type of occupation

14. Is anybody in your family is engaged in your traditional occupation (caste-based)?

Yes/no

- a. If yes, specify.....

15. How long have you been living in this area?

.....

16. Rank the following reasons why you chose to reside in this location

- i. SC majority area 1 2 3 4
- ii. Easy Access to Job location 1 2 3 4
- iii. Low rent 1 2 3 4
- iv. Long years of stay 1 2 3 4

17. Do you think living in an SC majority area have any special advantage while implementing policies?

Yes/No

II. Public Amenities

18. Please rate the following utilities in your locality

a. Public transportation system

- i. Poor
- ii. Fair
- iii. Average
- iv. Good
- v. Excellent

b. Public health service

- i. Poor
- ii. Fair
- iii. Average
- iv. Good
- v. Excellent

c. Water supply

- i. Poor
- ii. Fair
- iii. Average
- iv. Good
- v. Excellent

d. Electric supply

- i. Poor
- ii. Fair
- iii. Average
- iv. Good
- v. Excellent

- e. Sewage system
 - i. Poor
 - ii. Fair
 - iii. Average
 - iv. Good
 - v. Excellent

III. Discrimination

19. Have you felt discriminated while urban planning and policy formulation/implementation?

Yes/no

20. Have you/your family felt disadvantaged of being from a Scheduled caste?

- i. Never
- ii. Seldom
- iii. Some times
- iv. Often
- v. Frequently

21. Have you ever been denied of any service private/public due to your caste status?

Yes/No

a. If yes, specify

- i. Untouchability
- ii. Delayed services
- iii. Non responsive to your requirements
- iv. Others

22. Has anybody in your family been a victim of caste discrimination at workplace?

Yes/No

a. If yes, specify

- i. Untouchability
- ii. Lower pay
- iii. Abuse publicly/privately
- iv. Physical violence
- v. No promotion
- vi. Others

23. Has anybody in your family been a victim of caste discrimination at educational institutions?

Yes/No

a. If yes, specify

- i. Untouchability
- ii. Denial of admission
- iii. Not allowed to mingle with upper caste children
- iv. Abuse publicly/privately
- v. Physical violence
- vi.

24. Do you think that your caste status has hampered your social mobility or job mobility?

Yes/No

a. If yes, specify.....

25. Has the recent suburbanisation affected the availability of jobs inside the city?

Yes/No

IV. Social Capital

26. Do you have any kind of caste organisation in your locality?

Yes/No

27. Are you a member of any such organisation?

Yes/No

a. If yes, specify.....

28. Do you have SHGs / microfinance in your locality?

Yes/no

a. If yes, is the membership caste based?

Yes/no

b. Is anybody an active member of it?

Yes/No

29. Which among the following do you feel is more safe and comfortable?

- i. Living near same caste
- ii. Living near any SC caste
- iii. Caste doesn't matter
- iv. Living near upper caste

V. Relocation

30. Do you wish to relocate from your current place of residence?

Yes/no

a. If yes, why?

- i. Lack of amenities
- ii. Discrimination based on caste
- iii. Others specify.....

b. If no, why?

- i. Comfortable neighbourhood
- ii. Strength of being a majority in the area
- iii. Easy accessibility to work place
- iv. Others specify.....