

Appendix

Population Analysis and Projections

Population and population growth are important indicators for future planning as they serve as the basis of population projections. Pondicherry has grown considerably faster than neighbouring Tamil Nadu between 1961-91 resulting in high population projections not only for the year 2001 but for future decades as well. The recently released provisional population tables for Census 2001 suggests, however, that the decadal population growth rate for 1991-2001 is considerably less than for the previous decade, namely 20.56 per cent as opposed to 33.64 per cent. It is therefore necessary to explore the reasons for this slow down and its implications for a Vision 2020 document.

This appendix examines population growth in Pondicherry between 1961-2001 with the aim of understanding the nature of it and the reasons behind it.¹ Population growth has two main components: natural growth and migration. Data on natural growth rates is available from the Sample Registration System (SRS). The Census of India has special volumes on migration. These are however not available for the 2001 Census. Our analysis of migration is therefore based on the data available from the 1971, 1981 and 1991 Census.

There have also been questions raised about the reliability of the migration data. Another way to analyse migration is to subtract the decadal population increase due to natural growth from the overall decadal population growth. Here we examine migration in that way as well and compare the figures obtained using these two different methodologies. As suggested at the outset, the purpose of examining migration and natural growth is to make predictions for future growth in Pondicherry as this is central for planning or having a Vision 2020 document. We will therefore compare the results obtained using these two methodologies and attempt to make certain predictions for future population growth rates.

¹ Some of the population details given will be a repeat of the population discussion in the main text . It is, however, necessary for the more detailed analysis that is undertaken in this appendix.

Having done that an attempt is made to understand the nature of migration in terms of its urban and rural character so as to get a better picture of the changing Urban-Rural profile of the Union Territory. We do this, however, only for migration from outside the state². As we shall illustrate, the composition of migration has changed significantly over the last few decades becoming much more urban in character. Not surprisingly, therefore, the process of urbanisation has picked up significantly as well.

To the extent possible, we also examine the regional differences within Pondicherry. That, however, is only possible in terms of population growth rate in its cumulative character as there is no separate SRS or migration data for the four regions of Pondicherry, Karaikal, Mahe and Yanam.

The Union Territory of Pondicherry, as mentioned above, has experienced significant population growth over the last few decades. Whereas the population was 3,69,079 in 1961, at the latest Census count in 2001 (provisional) it had increased to 9,73,829. Table A-1 gives both the population and the decadal population growth rates between 1961 and 2001. As can be seen, the decadal growth rates for 1961-71, 1971-81, 1981-91 and 1991-2001 were 27.81, 28.15, 33.64 and 20.56 per cent respectively.

Table A – 1
Population and Decadal Population Growth, 1961-2001

Region	Population					Population Growth			
	1961	1971	1981	1991	2001	1961-71	1971-81	1981-91	1991-2001
Pondicherry	258561	340240	444417	608338	73504	31.59	30.62	36.88	20.82
Karaikal	84001	100042	120010	145703	170640	19.10	19.96	21.41	17.11
Mahe	19485	23134	28413	33447	36823	18.73	22.81	17.72	10.09
Yanam	7032	8291	11631	20297	31362	17.90	40.28	74.51	54.52
Pondicherry Union Territory	369079	471707	604471	807785	973829	27.81	28.15	33.64	20.56

Source: Census, Various issues.

There are significant differences within the Union Territory. The decadal growth rate of the Pondicherry region has been over 30 per cent for all the decades between 1961-91. Yanam which had a moderate decadal growth rate of 17.90 per cent between

² As we state at the end of this paper, migration from within the Union Territory is similar to that from outside.

1961-71 has experienced phenomenal growth thereafter, namely 40.28 per cent, 74.51 per cent and 54.52 per cent between 1971-81, 1981-91 and 1991-2001 respectively. The high growth rates of Yanam might be due to the commercial nature of the town in an otherwise very low growth rural area of Andhra Pradesh characterized by shrimp and rice farming. On the other hand, decadal growth rates in Karaikal and Mahe have been around 20 per cent throughout with a declining trend in 1991-2001. Decadal growth rates in fact throughout the Union Territory have dropped in the last decade even in Pondicherry where the growth rate was only 20.82 per cent.

Table A- 2 gives details with regard to the female-male sex ratio for the Union Territory as a whole and the various regions. In the Union Territory as a whole the female-male sex ratio has been below 1000 upto 1991. The provisional data of the 2001 Census suggests, however, that the sex ratio is now 1001. Although Mahe and Karaikal also experienced a declining sex ratio between 1961 and 1991, it has consistently been above 1000 in both areas. This has not been the case in Pondicherry and Yanam where the sex ratio has steadily declined over the decades upto 1991 to well below 1000. Although the sex ratio has increased in these two areas as well between 1991 and 2001 it continues to be below a 1000, namely 990 in Pondicherry and 975 in Yanam.

Table A –2
Sex Ratio (Female to Male) in Pondicherry, 1961-2001

Region/Year	1961	1971	1981	1991	2001
Pondicherry	988	968	966	964	990
Karaikal	1056	1023	1021	1008	1023
Mahe	1175	1169	1143	1156	1148
Yanam	1021	1024	974	969	975
Pondicherry U.T.	1013	989	985	979	1001

Source: Census, various issues.

Table A-3 compares population growth rates in Pondicherry with that of Tamil Nadu and All-India. As can be seen, the overall decadal population growth rates in Pondicherry between 1961-71, 1971-81 and 1981-91 was higher than both that of Tamil Nadu and All-India. Whereas the decadal growth rates of Pondicherry were well above 25 per cent between 1961–71 and 1971-81, it reached 33.64 per cent between 1981-91. On the other hand, the All-India growth rate was consistently below 25 per cent and that of Tamil Nadu below 20 per cent in the decades 1971-81 and 1981-91. Only in the last

decade, 1991-2001 has the decadal population growth rate of Pondicherry dropped to below that of India. However, it has remained significantly higher than that of Tamil Nadu which dropped to 11.19 per cent.

Table – A 3
Decadal Population Growth Rates in Pondicherry, Tamil Nadu
and All-India, 1961-2001

Region/ Decade	1961-71	1971-81	1981-91	1991-2001
Pondicherry	27.81	28.15	33.64	20.56
Tamil Nadu	22.30	17.50	15.39	11.19
India	24.80	24.66	23.86	21.34

Source: Census, various issues.

Two questions emerge from the above discussion: (1) why has the decadal population growth rate been higher in Pondicherry than in Tamil Nadu and All-India, and (2) why has it slowed down in the last decade. In order to understand why the decadal growth rates have slowed down, it is necessary to look much more carefully at the two components of growth, natural growth and migration.

Annual natural growth rates are available from SRS. We have been able to get SRS data for Pondicherry for the years between 1971-1996.³ We have therefore been able to calculate decadal population growth rates due to natural growth by using the yearly natural growth rates to predict the natural growth component of total decadal population growth. In order to do this, a simple method was followed. An example will highlight this. For example, the population in 1992 can be calculated by taking the 1991 population and multiplying it by the natural growth rate for the year and then adding this number to the 1991 population. In other words, $[z=y+nr(y)]$, where z is the population in a given year, y is the population in the previous year and nr is the natural growth rate (in %). In order to calculate the natural growth component for 1991-2001, we estimated the compound growth rate of the natural growth rate between 1991-96 and assumed that the compound rate would remain the same until 2001.

The indication is that the natural growth rate for Pondicherry has slowed down considerably since the early seventies. The decadal natural growth rate between 1971-81 was 20.08 whereas between 1981-91 it was only 15.97. The indication is that it has

³ As data is not available for the year 2000, we have predicated it by looking at the trend in previous years.

further slowed down between 1991-2001 to 11.54 per cent. These decadal natural growth rates are far less than the All-India average and relatively similar to those of Tamil Nadu. While natural growth rates in Tami Nadu were less than Pondicherry between 1971-81, since 1981 Pondicherry's natural growth rates have become less than those for Tamil Nadu (Table A-4)

Table A-4
Decadal Natural Growth Rates in Pondicherry, Tamil Nadu
and All-India, 1971-2001

Year / Place	Pondicherry	Tamil Nadu	All-India
1971-81	20.08	17.53	21.63
1981-91	15.97	16.12	23.29
1991-2001	11.54	12.18	20.40

Source: Calculated

This would suggest that a large component of decadal population growth has to be explained by the migration component. The next task therefore is to try and estimate the extent of migration and what perhaps could be the reasons for its slow down. We are presuming a slow down given the fact that the decrease in the natural growth rate in the last decade cannot explain the significant slow down in overall decadal population growth rate between 1991-2001.

As suggested above, there are two ways in which the 'migration component' can be estimated, i.e. using the migration data of the Census itself and calculating it by subtracting the natural growth rate component of growth from the overall decadal population growth. We start by examining the migration data from the Census. The Census migration data is categorised according to duration of stay. Categories include <1 year, 1-4 years, 5-9 years, 10-19 years and 20+ years.⁴ For the purpose of our analysis, we only include migrants of the first three categories, namely <1 year, 1-4 years and 5-9 years as those included in 10+ years would have been enumerated in the previous Census decade. Also, the Census data enumerates migrants as those from within the state (or union territory), from other states of the country and from other countries. Since migrants from within the state would already have been enumerated in the previous census as well,

⁴ In the 1991 Census, there is no 20+ category, only 10+ category.

they are excluded from our analysis here.⁵ Finally, out- migrants have to be substituted from in-migrants to get a number for net-migrants coming into Pondicherry.

Table A-5 compares the migration component of decadal growth with the overall decadal growth for the decades 1971-81 and 1981-91.⁶ As can be seen, the 'migration component' in 1981 and 1991 is only 8.97 percent 24.94 percent per cent respectively. What is apparent, however, is that the number of migrants (in absolute terms) increased from 11,907 in the decade 1971-81 to 50,699 in the decade 1981-91.

Table A-5
Decadal Growth Rate and 'Migration Component': 1971-81 and 1981-91

Decade	Decadal Population Increase	Migration Component	Percentage Contribution of migration	Natural Growth Component*	Percentage Contribution of Natural Growth Component
1971-81	132764	11907	8.97	120857	91.03
1981-91	203314	50699	24.94	152615	75.06

*The Natural growth component indicated here is based on subtracting the migration component from the overall decadal growth. In that sense, it is not the true natural growth rate based on SRS data. We are using it here only for comparative purposes, i.e. in order to see how calculating migration and consequently the natural growth rate varies significantly based on the two methodologies.

Having said that, it is important to be somewhat cautious about this data. There are those who feel that the migration data might underestimate the extent of migration. Instead, it is argued, that migration should be calculated by subtracting the natural growth rate component from the total decadal population increase.

Let us therefore look at the 'migration component' using the above mentioned methodology. We are only able to do that for the decades 1971-81, 1981-91 and 1991-

⁵ Later on when we examine the question of urbanisation we will also analyse the data on intra-state migrants.

⁶ Again this includes only migrants of <10 years.

2001.⁷ As highlighted in Table A-4, the natural growth rates for 1971-81, 1981-91 and 1991-2001 were 20.08, 15.97 and 11.54 respectively. Using this data, we are able to calculate decadal population growth due to natural growth and consequently migration as the remainder of total decadal growth minus natural growth. Table A-6 gives the details.

Table A-6
Migration Calculated Using SRS Methodology

Decade	Decadal Population Increase	Decadal Natural Growth Increase	Migration (SRS Calculations)	Migration (Census Calculations)
1971-81	132770	94601	38038	11907
1981-91	203314	96554	106760	50699
1991-2001	166044	90310	71057	Not Available

Source : Calculated

As can be seen from the table, there are significant discrepancies in terms of the 'migration component' calculated using the two different methodologies. Whereas in the decade 1971-81, the migration component using the SRS methodology was 38,038 it was only 11,907 using the Census data. In the decade 1981-91, the SRS method illustrated that there were 1,06,760 net migrants, the Census count was only 50,699.

What can then be surmised about the migration component. The provisional data for the 2001 Census would seem to suggest that migration has slowed down given the significant drop in overall decadal population growth. This is confirmed by calculations using the SRS methodology. This however cannot be verified by the Census data as it is not yet available for 2001.

It is therefore better if we take an average of the Census and SRS calculations for 1971-81 and 1981-91 and use the SRS methodology for 1991-2001 as there is no available Census data. If we do this, the indication from Table A-7 is that the number of net migrants increased from 1981 to 1991 but has slowed down after 1991.

⁷ We are not able to do these calculations for 1961-71 because we do not have SRS data. We are however able to make the calculations for the most recent decade - something we were not able to do with the Census data - because of SRS data for the last decade.

Table A-7

Number of Net Migrants (Average Between Census and SRS Methodology)

Year	Number of Migrants
1971-81	24973
1981-91	78730
1991-2001	71057

Source: Calculated

For our purposes of estimating future population growth in the Union Territory of Pondicherry, we need to keep in mind a few things. The indication is, given the provisional data of the 2001 Census, that the decadal population growth rate has slowed down. As the decline in natural growth rate cannot account for this entire slow down, we must assume that migration has slowed down from its peak 1981-91. Why this is so remains unclear but perhaps it is due to over-saturation of urban areas in Pondicherry.

The other important question is will this decadal population growth slow down continue further. Again this requires looking at the two components of growth, natural growth and migration. In terms of natural growth rate it is most likely that it will slow down a little more but then reach a minimum from which it will no longer decline.

Three scenarios have been put forth:

Scenario 1: The decadal growth rate of 20.56 per cent for 1991-2001 has been kept constant for the decades 2001-2011 and 2011-2021. Given the likelihood of both natural growth rates declining further and migration slowing down further, this is likely to be a high estimate.

Scenario 2: The natural growth rate declines from 11 per cent between 1991-2001 to 9 per cent between 2001-2011 and then further to 7 per cent between 2011-2021. There is a general consensus that natural growth rates will not decline below the 7 per cent mark. The migration rate of 8.8 per cent between 1991-2001 has been kept constant for the two decades 2001-2011 and 2011-2021.

Scenario 3: The natural growth rate declines to 9 per cent between 2001-2011 and then to 7 per cent in 2011-2021. Migration rates decline by 33 per cent between 2001-2011 and a further 33 per cent between 2011-2021.

Using these three scenarios, the population projections for 2011 and 2021 will be as follows (Table A-8)

Table A-8
Population and Decadal Growth Rate Projections, 2001-2021

Scenario	Population Projection		Population Growth Projection	
	2011	2021	2001-2011	2011-2021
Scenario 1	11,74,048	14,15,432	20.56	20.56
Scenario 2	11,47,171	13,28,424	17.80	15.43
Scenario 3	11,24,101	12,50,900	15.80	11.28

Source: Calculated

These scenarios can be used as a baseline for further calculations undertaken in the different sectoral and thematic studies.