Centre for Development Economics

WORKING PAPER SERIES

On Measuring Shelter Deprivation in India

K. Sundaram
Suresh D. Tendulkar

Delhi School of Economics

Working Paper No: 23

Executive Summary

This paper presents a comprehensive composite index of shelter deprivation for the rural and the urban households in the major states of the Indian Union for a recent period. The novelty of the index lies in combining, possibly for the first time, four distinct quantifiable dimensions of shelter deprivation. These dimensions are: (a) extreme shelter deprivation in the form of stark houselessness, (b) deprivation with respect to certain basic amenities for the 'housed' households, (c) deprivation in terms of the quality of dwelling structure with regard to fitness for human habitation, and finally (d) overcrowding in two dimensions, namely, overcrowding in the sense of location in a congested cluster of households and overcrowding within a dwelling structure in terms of persons residing in it. Deprivation is measured in terms of the proportion of households affected by (a) to (d). We provide component indicators for (a) thru (d) before attempting an aggregation over all the four dimensions. The exercise is based on the data available in the population censuses of 1981 and 1991 supplemented by the National Sample Survey on Housing conditions carried out during 1988-89. Wherever possible, comparisons are given between 1981 and 1991.

Salient findings of the study are summarised below.

The proportion of houseless households declined between 1981 and 1991 in the rural areas of all the major states and in the urban areas of eleven out of fifteen states. The urban proportion was higher than its rural counterpart at the all-India level as well as in almost all the states. While the absolute number of houseless households declined for rural households in all except one state, it increased at the all-India level as well as in a number of states for the urban households. In terms of the state-wise concentrations, sixty percent of the 0.30 million rural houseless households were located in Maharashtra, Gujarat and Madhya Pradesh and fifty per cent of 0.22 million urban

1

houseless urban households were found in Maharashtra, Andhra Pradesh, Uttar Pradesh and West Bengal.

Turning to the amenities available to the 'housed' households we cover three: (i) safe drinking water (including from wells within premises), (ii) toilet facilities and (iii) electricity. Interpretation of reported access to toilet facilities (with uniform definition across all states) presents problems in the context of wide diversities in socio-cultural habits and practices in this regard especially among rural households in a continental country.

The proportion of households having access to each of the three amenities, taken singly, shows a clear and unambiguous rise for the rural as well as the urban households in all the states.

In the composite index of amenities deprivation, we consider the following categories of households (in descending order of weight attached): not having all the three amenities; not having any two; not having access to drinking water only; not having toilet facilities alone; and, not having electricity alone.

In terms of the composite index, amenities deprivation was found to be lower for the urban households than their rural counterparts in all the states. The eastern states of Orissa and Bihar report the highest degree of deprivation and Punjab the lowest for both the rural and the urban households. The composite index was found to be rank-order-correlated most with proportion of households not having access to drinking water (rural) and not having any of the three amenities (urban).

The extent of deprivation in respect of quality of dwelling structure in terms of fitness for human habitation was approximated by the sum of the proportion of households located (i) in non-serviceable kutcha houses and (ii) in pucca and semi-pucca houses in bad condition.

2

In this dimension, the degree of rural deprivation was more serious than its urban counterpart in all the states except West Bengal and Uttar Pradesh. Assam, followed (with a wide margin) by Bihar and West Bengal were found at the upper end in terms of the degree of deprivation.

Overcrowding dimension of shelter has been explored in two alternative ways: (i) location of dwelling in congested clusters of houses and (ii) within house overcrowding.

Deprivation in respect of (i) has been captured in terms of the proportion of households staying in slums/bustees. Predictably, the urban proportion (13 percent) was higher than the rural (6 percent) for all-India and fourteen out of sixteen major states (Assam and Andhra Pradesh being the exceptions). Across states, rural Assam and urban Maharashtra were most deprived with Kerala (rural and urban) being the least deprived.

Within-house overcrowding has been approximated in terms of the sum of the proportions of households with: (i) no exclusive room (irrespective of the number of persons), (ii) 3 or more persons living in one room, and, (iii) 6 or more persons living in two rooms. Estimates based on 1981 Census show that rural households suffered a greater degree of deprivation than their urban counterparts in all the states except Haryana, Karnataka and Uttar Pradesh. Maharashtra turned out to be the most and Kerala the least deprived for rural as well as urban households. The situation may have improved by 1991.

In the all inclusive composite index, 50 percent weight has been attached to houselessness, 25 percent to amenities deprivation, 10 percent each to quality of dwelling and within house overcrowding and the remaining 5 percent to stay in slum/bustees.

Overall, (in terms of a composite index over dimensions (a) thru (d)) degree of rural deprivation turned out to be higher

than urban across all the states. At the higher end of the deprivation scale were Bihar and Orissa (rural) and Maharashtra and West Bengal (urban). Kerala, Punjab and Haryana were the least deprived for the rural as well as the urban households. In terms of inter-state rank order correlation, the overall composite index was most correlated with the index of amenities deprivation for the rural and with the overcrowding deprivation for the urban households.

1 Introduction

Shelter is an important facet of living standards. It has an important role as a contributor to the health status of the population. Often times, it also reflects the combined consequence of educational and economic status. The quality of shelter is also important as a factor conditioning social acceptance and social interaction. In common perception too, the need to be reasonably sheltered is at least as basic as the need to be adequately nourished and clothed.[1]

Central to an understanding of the problems of measuring the quality of shelter is its multi-dimensionality.

Starting with the narrowest concept of a 'house', one cannot assess its livability just from the observed materials used for the walls and the roof. One has to bring into the picture at least the age of the structure and its stability - not easy to ascertain from casual inspection.

In addition to the above, 'fitness for human habitation' is taken to include other facets associated with the structure such as freedom from damp, natural light and air, water supply, drainage and sanitary conveniences and facilities for the storage, preparation and cooking of the food and for the disposal of waste water.[2]

While the availability of electricity in the house is not listed above, in the context of modern day living, this too may be regarded as a basic amenity.

On top of these facets associated with the narrow concept of a dwelling, there are locational considerations with reference to the distance from the place of work, the socio-cultural composition of neighbourhood, the social and public amenities available in the vicinity, the air-quality and so on. Widening the range of choices is the availability of several technologies

5

for satisfying the need along any given dimension, and, the possibility of trade-offs across dimensions as also between shelter and other needs.

The fact that the ultimate 'choice' of shelter by a household is shaped by socio-cultural factors along with the more conventional economic budget constraint complicates further the assessment of the quality of shelter. Many of the above factors relating to the quality of shelter are not easily quantifiable and even where quantifiable, the absence of readily available data at the requisite level of disaggregation limits the exercise.

An attempt is made in this paper to capture at least a few major elements of shelter-deprivation and build-up a composite index of such deprivation separately for the rural and the urban households at the level of all-India and the major states of the Indian Union. The principal data-base for this exercise is provided by the recently released census publication on <u>Housing and Amenities</u>. This provides data on the housing stock and amenities that were collected during house list operations (in 1990) preparatory to the 1991 Population Census.[3] In addition, to a limited extent, we have also drawn on the results of the 44th Round National Sample Survey on Housing Condition with July 1988 - June 1989 as the survey period.[4]

Throughout this paper, the basic unit of analysis will be the household. In analysing shelter-deprivation we focus on four broad facets.

First, (Section 2) we consider the question of "Houselessness", by reference to the proportion of households not able to afford and hence reside in a house.[5] This reflects an extreme form of shelter deprivation.

Shifting the focus next (Section 3) to the 'housed' population we consider the access of the households to three

6

basic amenities: safe drinking water, toilet facilities and electricity. Retaining the same focus, the discussion on access (or, rather the lack of it) to the basic amenities is followed in Section 4 by the discussion and computation of a composite index of deprivation with respect to the three amenities taken together.

A consideration of the quality of the structure - essentially by reference to the materials used for the roof and the walls is taken up in Section 5.

Next, in Section 6, drawing on the results of NSS 44th Round Survey on housing conditions and on the 1981 Census results, we consider briefly two aspects of the problem of overcrowding. In the first instance, the focus will be on overcrowding in the sense of location in a congested cluster of dwelling units in a given area. In the alternative perspective, the focus will be on crowding within a house. In both cases, the indicator used will be the proportion of households affected by overcrowding.

In the final section, the different facets of shelter-deprivation are brought together in the form of a composite index of shelter-deprivation.

2 Houselessness

One stark and unambiguous indicator of extreme shelter-deprivation is not being able to normally reside in a house with walls and roof, howsoever their condition and what ever the materials used therefor. The starkness of this measure of shelter-deprivation is magnified by the liberal definition of a "house" adopted by the Population Census - our data base. According to the Census definition <u>any</u> structure with four walls and a roof will qualify as a Census house. In fact, even walls may be dispensed with: a structure with a conical roof that almost touches the ground, with an entrance, will also qualify as a Census house. Notice in particular that, in the Census

definition of a house, there are no stipulations about size or about the materials used for the walls and roof.[6,7]

The Population Census makes a special effort to enumerate the houseless population. The enumerators are specially instructed to take note of the possible places where the houseless[8] population is likely to live such as on the road side, pavements or in open temple mandaps and the like. They are also asked to "keep particular watch on the large settlements of nomadic population who are likely to camp on the outskirts of villages". All houseless persons are to be enumerated in a one-night operation (on a common pre-specified date) throughout the country.

The Census enumeration is on a full-count basis. However, in view of the massive volume of data, the tabulation of the results on the houseless population (as also on all other characteristics of the houses in which the housed population live) is based on a 20 per cent sample for states having a population of 10 million or more. The tabulations for the smaller states and all the Union Territories including Delhi are based on the full count. On this basis, estimates of the houseless population are separately derivable for the rural and urban areas of all the districts as well as for the larger cities/urban agglomerations including, in particular, the four metros (Calcutta, Bombay, Delhi and Madras) and other 'million-plus' cities.

Based on the results of the 1981 and the 1991 Population Censuses, a comparative picture on the number of the houseless and the housed households in 1981 and 1991 at the level of all-India and the major states are presented separately for the rural (Table 1) and the urban (Table 2) areas. Since the Census operations could not be conducted in Assam in 1981 and in Jammu and Kashmir in 1991, comparable figures for all-India exclude both these states.

At the all-India level (excluding Assam and Jammu and Kashmir) and considering the rural and the urban areas together there were a little over half a million houseless households in 1991. This formed a little over one-third of one per cent (0.35 per cent) of the total (housed plus the houseless) households[9]. In 1981, the combined (rural plus urban) population of the houseless was higher both in absolute number (0.62 million) and as a proportion of the total (0.53 per cent).

The decline in the number and the proportion of the houseless households between 1981 and 1991 occurred at the level of all-India and almost all the major states in the rural areas.

In the case of urban areas, in contrast, there was an increase in the absolute number of the houseless households between 1981 and 1991 at the level of all-India and in a number of states. However, as a proportion of total households, the share of the houseless declined in all but 4 of the 15 major states. The exceptions were: Gujarat, Himachal Pradesh, Orissa and Uttar Pradesh.

In both the rural and the urban areas, and at both time-points, the highest number of the houseless are located in Maharashtra. In 1991, Gujarat and Madhya Pradesh in rural areas and Andhra Pradesh, Uttar Pradesh and West Bengal in the urban areas were the other states with 10 per cent or more of the all-India houseless population. Together with Maharashtra, these states accounted for a little over 60 per cent of the houseless in rural India and a little over half of the all-India houseless in urban areas.

Table 1 : The Housed and the Houseless Households in Rural Areas.
All India and Major States : 1981-1991

State	1981				1991			
	Housed ('000s)	Houseless ('000s)	Total ('000s)	Houseless as % of Total	Housed ('000s)	Houseless ('000s)	Total ('000s)	Houseless as % of Total
Andhra Pradesh	8400	44	8444	0.52	10341	27	1036£	0.26
Assam	N.A.	N.A.	N.A.	N.A.	3329	1	3330	0.02
Bihar	10104	7	10111	0.07	12256	7	1226£	0.06
Gujarat	3980	57	4037	1.41	4795	50	484£	1.03
Haryana	1476	8	1484	0.57	1917	4	1921	0.21
Himachal Pradesh	701	4	705	0.60	877	2	879	0.23
Jammu & Kashmir	738	2	740	0.27	N.A.	N.A.	N.A.	N.A.
Karnataka	4530	21	4551	0.46	5530	16	554£	0.29
Kerala	3617	6	3623	0.17	4032	5	403£	0.12
Madhya Pradesh	7309	72	7381	0.98	9049	35	908£	0.39
Maharashtra	7376	110	7486	1.47	8993	98	9091	1.08
Orissa	4357	12	4369	0.28	5172	8	5180	0.15
Punjab	1924	7	1931	0.36	2358	6	2364	0.25
Rajasthan	4523	31	4554	0.68	5668	17	568£	0.30
Tamil Nadu	7030	9	7039	0.13	8427	6	8433	0.07
Uttar Pradesh	15642	13	15655	0.08	18108	13	18121	0.07
West Bengal	6988	14	7002	0.20	8903	6	8909	0.07
INDIA (Excluding Assam & Jammu & Kashmir)	89335	418.1	89753.1	0.47	108259	304	108563	0.28

Notes : The figures under the column heading "Total" represents the sum of the housed and the houseless households. In particular, it excludes the "Institutional" Households.

Table 2 : The Housed and the Houseless Households in Urban Areas.
All India and Major States : 1981-1991

State	1981				1991			
	Housed ('00s)	Houseless ('00s)	Total ('00s)	Houseless as % of Total	Housed ('00s)	Houseless ('00s)	Total ('00s)	Houseless as % of Total
Andhra Pradesh	24221	253	24474	1.03	33683	270	33953	0.80
Assam	N.A.	N.A.	N.A.	N.A.	4722	7	4729	0.15
Bihar	14114	69	14183	0.49	18583	73	18656	0.39
Gujarat	18808	114	18922	0.60	26751	170	26921	0.63
Haryana	5044	22	5066	0.43	7297	20	7317	0.27
Himachal Pradesh	768	4	772	0.52	1100	10	1110	0.90
Jammu & Kashmir	1962	2	1964	0.10	N.A.	N.A.	N.A.	N.A.
Karnataka	18153	153	18306	0.84	24892	150	25042	0.60
Kerala	7816	40	7856	0.51	13585	40	13625	0.29
Madhya Pradesh	19006	174	19180	0.91	27270	160	27430	0.58
Maharashtra	40824	426	41250	1.03	59090	390	59480	0.66
Orissa	6048	47	6095	0.77	8164	70	8234	0.85
Punjab	8070	50	8120	0.62	10241	40	10281	0.39
Rajasthan	12419	82	12501	0.66	17146	80	17226	0.46
Tamil Nadu	32251	82	32333	0.25	39162	80	39242	0.20
UttarPradesh	33522	158	33680	0.47	43241	220	43461	0.51
West Bengal	26724	252	26976	0.93	36172	210	36382	0.58
INDIA (Excluding Assam & Jammu & Kashmir)	283457	2093	285550	0.73	390510	2163	392673	0.55

Notes :   The figures under the column heading "Total" represents the sum of the housed and the
houseless households. In particular, it excludes the "Institutional" Households.

11

Confining ourselves to the situation in 1991, it is seen that, as a proportion of the total households in the state, the share of the houseless is greater in the urban segment than in the rural areas in almost all the major states and at the all-India level. This would broadly reflect the greater scarcity of space (and, consequently the higher costs of houses) in urban areas. Maharashtra and Gujarat, two of the most highly urbanised and industrialised states in the country, constitute the two major exceptions to this rule. In both these states, the proportion of the houseless (to the total) is seen to be higher in the rural areas. They also constitute the only two instances of the proportion of the houseless exceeding one per cent of the total (in that segment). Factors underlying the relatively large number of the houseless in the rural areas of Maharashtra and Gujarat are not clear.

Given the liberal definition of a Census house, the relatively small share of the houseless in the total is not surprising. The fact that, nevertheless, over half a million households remained houseless in the country as a whole in 1991 represents a somber picture of stark and absolute shelter-deprivation.

3   Basic Amenities

In this and the subsequent sections we shift the focus from the houseless to the 'housed' households and explore different facets of the quality of shelter enjoyed by households who formally have a shelter i.e., those reported to be residing in a structure qualifying for the Census definition of a house[10].

Central to the question of shelter-quality is the access of the households to certain basic amenities deemed to be necessary for "livability'. The census reports on three basic amenities: safe drinking water, toilet facilities and electricity. Of the three amenities, unquestionably, access to safe drinking water is of paramount importance - both in its own right and as a key

factor conditioning the health status of the population. As
between electricity and toilet facilities, relative ranking is
difficult. From the perspective of the health status of the
population, access to toilet facilities may be ranked higher than
access to electricity. Yet, locating toilet facilities within
or close to the residence is heavily conditioned by
socio-cultural norms. In this regard it is pertinent to note
that in the 1981 Population Census the question on access to
toilet facilities was not even canvassed among rural households
- reflecting the ground reality of such facilities within the
house being rare in rural India.

This question was, however, canvassed among all urban
households. In the 1991 Population Census, reflecting the
changes (albeit slow) in the socio-cultural norms, the question
on access to toilet facilities has been canvassed among both
rural and urban households. Yet, as we shall see presently, even
today, less than 10 per cent of the households in rural India
have access to toilet facilities. Even in the urban areas, the
proportion of households having access to toilet facilities is
lower than that of households having access to electricity.

The issue of relative importance of the three facilities
briefly considered above would be of relevance when constructing
a composite index of amenities-deprivation which we take up in
the following section. Prior to that, the access of households
to each of these facilities is taken up for discussion in this
section.

3.1 Drinking Water

The Census distinguishes wells, tap, tubewell/handpump,
tank, canal/river and a residual category of other sources of
drinking water. In the case of each source, it also records
whether the facility is available within or outside the premises.

Generally, a tap (presumably fed with filtered water supply by the local authorities) is regarded as the safest source. In the 1991 Census report on Housing and Amenities, if the household had access to drinking water supplied from a tap or a handpump/tubewell situated within or outside the premises it is considered as having access to 'safe drinking water'. An extremely puzzling feature of the results is that, on the adopted criterion, even in 1991, only a little over 12 per cent of households in rural Kerala, and about 39 per cent in urban Kerala have access to safe drinking water. And, this is quite inconsistent with Kerala's achievements in the area of health in terms of high life-expectancy and low infant and child mortality.

A major clue to this puzzle is provided by the fact that, for nearly 59 per cent of households in rural Kerala (and for a little over 46 per cent of households in urban Kerala), "wells within the premises" constitute the reported source of drinking water. Given that these wells are within the premises and hence within the control of the households with regard to water quality, this source can also be regarded as safe.

We present in Table 3 the data on the proportion of rural households having access to safe drinking water using the two alternative definitions - one excluding and the other including wells within the premises as a safe source in addition to tap and handpump/tubewells. This is presented for all-India and the major states for 1981 and 1991. Corresponding figures for urban households are presented in Table 4.

Apart from Kerala, the inclusion of wells within premises as a safe source of drinking water raises the proportion of households having access to safe drinking water by ten percentage points or more (in 1991) in the rural and urban areas of Assam and Orissa, in rural Tamil Nadu and in urban Bihar.

Table 3 : Percentage of Households Having Access to Safe Drinking Water in Rural Areas,
All-India and Major States : 1981-1991

| States | 1981 | | 1991 | |
| | Excluding | Including | Excluding | Including |
	Wells within premises		Wells within premises	
Andhra Pradesh	15.12	24.64	48.96	57.39
Assam	N.A.	N.A.	43.28	60.89
Bihar	33.77	42.74	56.55	62.39
Gujarat	36.16	41.89	60.04	66.95
Haryana	42.94	44.56	67.14	68.30
Himachal Pradesh	39.56	40.07	75.57	76.65
Jammu & Kashmir	27.95	28.86	N.A.	N.A.
Karnataka	17.63	25.27	67.31	73.20
Kerala	6.26	59.40	12.22	71.16
Madhya Pradesh	8.09	15.73	45.56	54.38
Maharashtra	18.34	25.20	54.02	62.00
Orissa	9.47	22.31	35.32	46.81
Punjab	81.80	85.28	92.09	94.27
Rajasthan	13.00	14.57	50.62	53.04
Tamil Nadu	30.97	39.87	64.28	67.73
Uttar Pradesh	25.31	29.07	56.62	60.12
West Bengal	65.78	71.02	80.26	84.14
India Excluding Assam Including J&K	26.50	35.07	N.A.	N.A.
India Excluding J&K Including Assam	N.A.	N.A.	55.44	63.56
(Coefficient of Variation %)		50.44		17.91

Sources :   The figures on the proportion of households having access to safe drinking
water, excluding 'Wells within the premises' as a safe soure are directly
taken from the 1991 Census Report on Housing and Amenities (ORGI, 1994)

For 1981, the proportion of households with 'Wells within the Premises'
as the source of drinking water have been estimated from Census of India,
1981, Household Tables, Table 7, (ORGI, 1987). The corresponding figures
for 1991 were supplied by ORGI.

Table 4 : Percentage of Households Having Access to Safe Drinking Water
in Urban Areas, All-India and Major States : 1981-1991

States	1981		1991	
	Excluding	Including	Excluding	Including
	Wells within premises		Wells within premises	
Andhra Pradesh	63.27	77.48	73.82	87.07
Assam	N.A.	N.A.	64.07	88.19
Bihar	65.36	77.02	73.39	85.54
Gujarat	86.78	90.22	87.23	93.09
Haryana	90.72	92.70	93.18	95.47
Himachal Pradesh	89.56	91.14	91.93	94.18
Jammu & Kashmir	86.67	89.25	N.A.	N.A.
Karnataka	74.40	83.07	81.38	90.31
Kerala	39.72	80.96	38.68	85.09
Madhya Pradesh	66.65	74.26	79.45	86.99
Maharashtra	85.56	90.56	90.50	95.15
Orissa	51.53	69.31	62.83	81.18
Punjab	91.13	94.52	94.24	98.00
Rajasthan	78.65	81.69	86.51	91.23
Tamil Nadu	69.44	83.04	74.17	87.69
Uttar Pradesh	73.23	79.44	85.78	90.72
West Bengal	79.76	89.74	86.23	94.79
India Excluding Assam				
Including J&K	75.06	84.01		
India Excluding J&K				
Including Assam			81.38	90.70
(Coefficient of				
Variation %)		8.67		5.06

Sources : See Table 3

16

Using the inclusive definition of safe sources of drinking water, it is seen that in both the rural and the urban areas there has been a clear and unambiguous increase in the proportion of households having access to safe drinking water between 1981 and 1991. This is true at the level of all-India and for each of the 15 major states for which data are available for both 1981 and 1991 Censuses. In both the rural and the urban areas, the inter-state disparity in access to safe drinking water, as measured by the coefficient of variation, has also declined between 1981 and 1991.

Despite this unambiguous improvement, a little over one-third of the rural households at the all-India level are deprived of safe drinking water even in 1991. In Orissa, a little over 53 per cent of the rural households are so deprived.

The situation in urban India is distinctly superior with the proportion of households having access to safe drinking water exceeding 90 per cent at the level of all-India and in 9 out of 15 major states. This proportion is in excess of 80 per cent in all the states and is as high as 98 per cent in Punjab.

3.2 Toilet Facilities

As noted earlier, the Population Census canvassed the question on households having access to toilet facilities among rural households for the first time in 1991 - although information on it was elicited from the urban households in the 1981 Census as well. Table 5 presents the Census estimates of the percentage of (housed) households having toilet facilities for all-India and the major states.

Table 5 : Percentage of Households Having Toilet Facilities,
All-India and Major States, 1981-1991

State	Rural	Urban	
	1991	1981	1991
Andhra Pradesh	6.62	44.07	54.60
Assam	30.53	N.A	86.06
Bihar	4.96	52.95	56.54
Gujarat	11.16	60.11	65.71
Haryana	6.53	58.09	64.25
Himachal Pradesh	6.42	55.12	59.98
Jammu & Kashmir	N.A.	64.54	N.A.
Karnataka	5.85	53.28	62.52
Kerala	44.07	59.14	72.66
Madhya Pradesh	3.64	52.73	53.00
Maharashtra	6.64	59.37	64.45
Orissa	3.58	41.88	49.27
Punjab	13.79	64.75	73.23
Rajasthan	6.65	56.48	62.27
Tamil Nadu	7.17	51.27	57.47
Uttar Pradesh	6.44	62.06	66.54
West Bengal	12.31	77.74	78.75
INDIA [1]	8.84	57.44	63.58
Coefficient of variation (%)	95.97	14.69	12.41

Notes 1 :   Figures in this row relate to india excluding both Assam and
Jammu & Kashmir and are comparable across the years.

The question on access to toilet facilites was not canvassed
for rural households in the 1981 population census.

Source   :   1991 Census Report on Housing and Amenities (ORGI:1994)

The results for urban India show some improvement in the proportion of households having toilet facilities in all the major states and at the all-India level between 1981 and 1991. Also, over the same period, inter-state disparity as measured by the coefficient of variation has declined. As of 1991, close to or above half of the urban households have toilet facilities in all the major states and at the all-India level. The proportion of households having toilet facilities is the highest in Assam and is the lowest in Orissa.

In rural India, in 11 of the 16 major states, and at the all-India level, less than 10 per cent of the households have toilet facilities. Even in Kerala, which has the highest proportion of rural households having toilet facilities, the reported proportion is lower than fifty per cent. The coefficient of variation also indicates a high level of inter-state disparity in the access of rural households to toilet facilities. This may reflect socio-cultural diversity in this respect.

3.3 Electricity

As for electricity, in both the rural and the urban areas, between 1981 and 1991 there has been a significant increase in the proportion of households having this facility (see Table 6). The gains have been particularly marked (25 percentage points or more) in the rural areas of Andhra Pradesh, Gujarat, Himachal Pradesh, Madhya Pradesh, Maharashtra and Punjab. Against this background, the gains have been negligible in rural Bihar where nearly 95 per cent of the households do not have electricity even today. At the other end of the spectrum, in urban Himachal Pradesh and urban Punjab close to or above 95 per cent of the households have electricity. This proportion is above 80 per cent in the urban areas of three other states, namely, Gujarat, Haryana and Maharashtra and in rural Himachal Pradesh.

Table 6 : Percentage of Households Having Electricity,
All-India and Major States : 1981-1991

State	Rural		Urban	
	1981	1991	1981	1991
Andhra Pradesh	12.53	37.50	52.22	73.31
Assam	N.A.	12.44	N.A.	63.21
Bihar	3.48	5.57	50.09	58.77
Gujarat	30.83	56.43	74.40	82.96
Haryana	41.04	63.20	82.22	89.11
Himachal Pradesh	51.08	85.86	89.36	96.24
Jammu & Kashmir	52.54	N.A.	92.18	N.A.
Karnataka	21.35	41.75	61.98	76.27
Kerala	23.21	41.95	54.57	67.65
Madhya Pradesh	6.89	34.49	56.42	72.52
Maharashtra	24.12	58.45	70.53	86.07
Orissa	13.03	17.45	51.74	62.11
Punjab	50.61	76.98	85.44	94.60
Rajasthan	8.70	22.44	63.67	76.67
Tamil Nadu	26.03	44.49	61.59	76.80
Uttar Pradesh	3.97	10.96	54.61	67.76
West Bengal	7.02	17.75	57.86	70.19
INDIA:	14.29	31.10	61.60	75.93
(Coefficient of variation %)	76.67	56.33	19.41	14.08

Notes : 1. Figures in this row relate to India excluding both Assam and Jammu & Kashmir and are therefore comparable.

Source : All the figures in the Table are drawn from the 1991 Census Report on Housing and Amenities (ORGI:1994)

In both the rural and the urban areas, there has been a decline in inter-state disparity in the proportion of households having electricity. The decline has been particularly sharp in the rural areas with the coefficient of variation falling from a little over 50 per cent to about 18 per cent. Despite this sharp decline, even in 1991, the extent of inter-state disparity is greater in rural areas than in the urban areas.

4   An Index of Amenities-Deprivation

In the previous section, we examined the current status and the changes over the 1981-91 decade in respect of access of households to safe drinking water, electricity and toilet facilities - each considered one at a time. The 1991 Census Report on Housing and Amenities (the Census Report, for short) provides, for the first time, information on the access of households to multiple amenities.

The information, in terms of percentage of housed households having/not having access to amenities, relate to the following:

1.   Having electricity and toilet;
2.   Having safe drinking water and toilet;
3.   Having electricity and safe drinking water;
4.   Having electricity, safe drinking water and toilet facilities; and
5.   Having none of the facilities - electricity, safe drinking water and toilet.

The above information is presented separately for the three social groups of scheduled castes, the scheduled tribes and a residual category of "others". We can obtain an estimate for the entire population as a weighted average of the figures for the three social groups.   The share of each social group in total households as per the Primary Census Abstract will serve as the weights. This is illustrated for the case of all-India rural in Table 7.

21

Combining this information with that on households having the three amenities - each considered one at a time - we can classify the households into different categories reflecting varying degrees of deprivation (i.e. non-access) with respect to the amenities. The categories are:

a. having none of the three amenities;
b. having neither water nor toilet facilities;
c. having neither water nor electricity;
d. having neither electricity nor toilet facilities;
e. not having any two of the amenities;
f. deprived only with respect to safe drinking water;
g. deprived only with respect to electricity; and
h. deprived only with respect to toilet facilities.

Categories (a) and (e) through (h), together with the residual complementary category (i) of households simultaneous enjoying all the three amenities, are mutually exclusive and exhaustive.

Clearly, this last category of households having all the three amenities are, unambiguously, not deprived in the matter of the three basic amenities.

Equally clearly, those having none of the amenities (category (a)) are the most deprived. Those not having any two amenities (category (e)) are less deprived than those in category (a) but, arguably, more deprived than those in categories (f) through (h) relating to those deprived in only one of the amenities.

Among those deprived with respect to only one of the amenities, deprivation in respect of safe drinking water may be viewed as a more serious deprivation than the deprivation in respect of either electricity or toilet facilities.

Table 7 : Percentage of Rural Households having multiple
amenities by social groups and average for all social groups : All-India, 1991

Sl. No.	Item	S.C.	S.T.	Others	All
1.	Having electricity and toilet	2.76	2.10	8.26	6.55
2.	Having safe drinking water and toilet	3.35	2.02	6.73	5.58
3.	Having electricity and safe drinking water	14.71	10.00	21.07	18.66
4.	Having electricity, safe drinking water and toilet facilities	1.86	1.14	4.88	3.90
5.	Having None of the facilities- electricity, safe drinking water and toilet	32.14	48.06	28.65	31.37

Notes and Sources :

The percentages for SC, ST and Others are drawn, respectively from Tables 3.7 (row 1),
thru Table 3.11 (row 5) of the 1991 Census Report on Housing and Amenities.

In all cases, the figures in the column for 'ALL" represents weighted averages of the
values for the three social groups with a weight of 19.232 for SC; 10.555 for ST and
70.213 for 'others'. These weights represent the share of each category in total
rural households in 1991 as per the Primary Census Abstract.

In this Table (as in the Census Report), "Wells within the premises" are excluded as
a safe source of drinking water.

As an indicator of deprivation, the percentage of households in a given category in relation to the total (housed) households is used. Next, reflecting the broad judgments on the relative social valuation of different categories of deprivation we assign, arbitrarily, a weight of ·8 (category (a)); 4 (category (e)); 2 (category (f)); and one each to category (g) and (h).

Using the structure of weights given above, we arrive at a composite index of amenities-deprivation. Being essentially a weighted average of the proportion(s) of households affected by differing degrees of amenities-deprivation, the composite index is also interpretable as the proportion of households suffering from deprivation of a composite amenity.

Two crucial steps in the derivation of the composite index are: (i) the derivation of the proportion of households deprived on a pair of amenities; and (ii) the derivation of the proportion of households who are deprived in respect of one amenity only.

Consider first the derivation of the proportion of households deprived on a pair of amenities.

Let P_1, P_2, P_3 be the percentage of households having water, electricity and toilet facilities - each considered one at a time. Similarly, let P_{12}, P_{13} and P_{23}, respectively, denote the percentage of households having both water and electricity, water and toilet and electricity and toilet facilities.

Corresponding to the above we can denote the not having categories with the prefix N. Thus, NP_1 will denote `not having safe drinking water', $NP_{12}$ will denote having neither water nor electricity and so on. In this notation, $NP_{123}$ will denote the category `having none of the three amenities'.

Taking the total households to be 100, the percentage of households having neither water nor electricity (NP_{12}) is derived as:

$$100 - [(P_1 - P_{12}) + (P_2 - P_{12}) + P_{12}]$$

Similarly, one can derive NP_{13} and NP_{23}.

Given NP_{123}, NP_{12}, NP_{13} and NP_{23}, we can derive the proportion deprived in any two of the amenities as:

$$[NP_{12} + NP_{13} + NP_{23}] \quad minus \quad [3 * NP_{123}].$$

Consider next the derivation of the proportion of households deprived with respect to only one of the amenities.

Let us use NP_1, NP_2, and NP_3 to denote, respectively, the percentage of households deprived only with respect to water; only with respect to electricity and only with respect to toilet facilities. Then, NP_1 can be derived as:

$$NP_1 = 100 + NP_{123} - [P_1 + NP_{12} + NP_{13}]$$

NP_2 and NP_3 can be similarly derived.

In implementing the procedure outlined above, due regard must be paid to the fact that in our analysis of access to safe drinking water we have included "wells within premises" as an additional safe source. In the Census Report, a narrower definition underlies the estimates presented.

How does this change the proportion of households in the different categories of amenities-deprivation?

It is easily seen that change in the proportion of households having safe drinking water can affect only the percentages of those deprived in respect of pairs of facilities involving water and the triplet of facilities. (In terms of the notation used, potentially, the expansion in the list of safe sources of drinking water will impact on NP_{12}, NP_{13} and NP_{123}). In

25

particular, it will leave unchanged the percentage of households having neither electricity nor toilet facilities (NP_{23}).

It is also easily seen that NP_{12}, NP_{13} and NP_{123} cannot exceed NP_1. In other words, the proportion not having safe drinking water sets an upperbound to the proportion of households having neither water nor electricity/having neither water nor toilet facilities/have none of the three facilities.

In deriving the values for NP_{12} and NP_{13}, it is also necessary to keep in view the constraint that the proportion of households deprived only with respect to one amenity (NP_1, NP_2 and NP_3) cannot be negative.

Having thus derived the values for NP_{123}, NP_{12}, NP_{13}, NP_{23} and, thence, the proportion of those not having any two of the amenities, as also the values for NP_1, NP_2 and NP_3, the category of those enjoying all three facilities simultaneously (P_{123}) is derived as a residual.[11]

The percentage distribution of rural households in the different categories of amenities-deprivation (with a residual category of unambiguous non-deprivation) and a composite index of amenities-deprivation are presented for all-India and sixteen major states in Table 8. Corresponding results for the urban households are presented in Table 9.

Consider first the rural situation.

At the all-India level, a little over 31 per cent of the rural households did not have even one of the three amenities while less than 7 per cent of the households enjoyed all the three amenities. Also, while none of the households was deprived with respect to water alone (and less than 2 per cent were so deprived in the case of electricity), a little over 20 per cent of the rural households reportedly suffered only with respect to lack of toilet facilities.

Table 8 : Index of Amenities - Deprivation in Rural Areas in 1991 : All-India and Major States

State	Percentage of Households Having					Percentage of Households Not Having				Composite Index
	All 3	None of 3 Amenities	Neither water nor toilet	Neither water nor electricity	Neither electricity nor toilet	Any two Amenities	Water Alone	Electricity Alone	Toilet Alone	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Andhra Pradesh	5.82	32.52	42.53	32.60	61.70	39.27	NIL	0.72	21.67	27.48
Assam	8.63	38.57	38.57	39.11	65.66	27.63	-	21.36	3.81	27.77
Bihar	2.89	37.61	37.61	37.61	92.36	54.75	-	2.07	2.68	32.79
Gujarat	10.30	21.84	33.05	21.44	43.11	32.08	0.40	0.86	34.52	21.20
Haryana	5.53	13.72	31.65	13.77	35.80	40.06	-	0.95	39.74	19.42
Himachal Pradesh	6.32	5.77	23.25	5.87	14.04	25.85	-	·	62.06	13.23
Karnataka	5.86	19.93	26.62	20.11	57.26	44.20	-	0.81	29.20	22.89
Kerala	32.76	28.84	28.84	28.84	46.74	17.90	-	11.31	9.19	20.18
Madhya Pradesh	3.01	38.31	45.62	38.19	65.00	33.88	0.12	0.63	24.05	29.18
Maharashtra	6.15	20.70	37.87	20.83	41.06	37.66	-	0.36	35.13	21.98
Orissa	3.06	52.69	52.91	52.97	82.03	29.84	-	0.24	14.17	34.71
Punjab	14.45	3.01	5.73	2.95	21.74	21.39	0.06	1.34	59.75	10.68
Rajasthan	4.75	40.94	46.11	41.79	75.66	40.74	-	1.05	12.52	31.50
Tamil Nadu	6.21	19.79	31.94	20.12	54.55	47.24	-	0.63	26.13	23.38
Uttar Pradesh	3.50	39.88	39.88	39.88	86.10	46.22	-	2.94	7.46	32.15
West Bengal	6.63	15.59	15.86	15.59	76.57	61.25	-	5.68'	10.85	24.14
ALL-INDIA	6.56	31.37	35.19	32.60	66.53	40.21	-	1.70	20.17	27.10

Source : As in Tables 3, 5 and 6

Notes : Composite Index : Entry in column (11) represents a weighted average of entries in columns (3); (7); (8); (9); and (10) with 8,4,2,1 and 1 respectively as weights

27

Table 9 : Index of Amenities Deprivation in Urban Areas in 1991 : All·India and Major States

State	Percentage of Households Having					Percentage of Households Not Having				
	All 3 Amenities	None of 3	Neither water nor toilet	Neither water nor electricity	Neither electricity nor toilet	Any two Amenities	Water Alone	Electricity Alone	Toilet Alone	Composite Index
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Andhra Pradesh	52.61	6.81	12.48	7.26	24.70	24.01	·	1.54	15.03	10.44
Assam	61.73	5.76	5.76	11.81	12.46	12.75	·	18.28	1.48	7.30
Bihar	51.32	12.64	13.20	13.90	36.01	25.19	·	3.96	6.89	13.30
Gujarat	64.76	3.27	6.41	3.77	16.09	16.46	·	0.45	15.06	6.72
Haryana	85.66	1.22	3.00	1.06	9.68	10.08	1.69	1.35	24.29	4.94
Himachal Pradesh	57.92	0.95	5.01	0.84	2.62	5.62	0.92	1.25	33.34	4.16
Karnataka	56.14	4.18	6.78	4.52	19.92	18.68	2.57	3.47	14.96	8.23
Kerala	60.96	13.87	13.87	14.91	20.65	7.82	·	10.66	6.69	9.97
Madhya Pradesh	50.94	8.13	12.80	8.31	25.42	22.14	·	1.88	16.91	10.77
Maharashtra	62.49	2.46	4.77	2.54	11.97	11.90	·	1.88	21.27	5.65
Orissa	47.52	15.24	18.13	15.93	36.14	24.48	·	1.06	11.70	14.54
Punjab	73.22	0.52	1.99	0.53	5.39	6.35	·	·	19.91	3.09
Rajasthan	60.46	5.37	7.88	6.26	21.52	19.55	·	0.92	13.70	8.49
Tamil Nadu	55.08	5.39	10.63	6.31	21.57	22.34	0.76	0.71	15.72	9.40
Uttar Pradesh	59.46	6.78	7.41	8.65	25.16	20.88	·	5.21	7.67	9.42
West Bengal	65.88	2.89	3.34	5.36	16.94	16.97	·	10.40	3.86	6.58
ALL·INDIA	59.62	5.36	8.13	6.53	19.99	18.57	·	3.06	13.39	8.35

Sources and Notes :   As in Table 8.

Across the states, Orissa has the highest proportion (about 53 per cent) of rural households in the category of having none of the three amenities. At the other end of this range, only 3 per cent of households in rural Punjab were located in this category of extreme amenities-deprivation. Interestingly, it is Kerala and not Punjab that has the highest proportion (nearly 33 percent) of households having all the three amenities. Also, for a state with nearly a third of the households having all the three amenities, a surprisingly large proportion of households in rural Kerala (about 29 per cent) did not have even one of the amenities.

In terms of the composite index, the least-deprived state is Punjab. At the other end of the scale, Orissa is the worst-off state in respect of amenities- deprivation.

Comparisons of rank-ordering of states by reference to the composite index on the one hand and deprivation in respect of individual amenities (each considered one at a time) show that the mapping is closest in the case of deprivation in respect of water. Interestingly, the rank-ordering of states on the composite index is less well correlated with the ordering by reference to the percentage of households having none of the amenities (Spearman's correlation coefficient = 0.8618) than with the ordering based on percentage of households not having safe drinking water (0.9294).

Turning now to the urban areas, the most striking result is that in each state and at the all-India level the percentage of households having none of the three amenities as well as of those not having any two amenities and therefore, also the composite index is lower than the corresponding values for the rural households. The amenities-deprivation is thus distinctly lower for the urban households.

At the all-India level, only about 5 per cent of the urban households did not have even one of the amenities. The highest

value for this category (15.24 per cent) is recorded by Orissa. The rank-ordering of states by reference to the composite index closely matches the rank-ordering by reference to the percentage of households having none of the three amenities with a Spearman's rank correlation coefficient of 0.9647. Aside of this, the ordering by reference to the percentage of households not having electricity and that by reference to the composite index yield a correlation coefficient of 0.9147.

5   Quality of Structure

In terms of the bare essential attributes of structures by reference to fitness for human habitation, some, like natural light and air, facilities for storage, preparation and cooking of food and for the disposal of waste water cannot be captured in any large-scale enquiry such as the National Sample Survey or the Population Census.

One proxy for the "freedom from damp" and, more generally the ability of the structure to protect the resident from the natural elements can be sought in terms of the materials used for construction of the walls, the roof and the floor of the house. Thus, in India, structures where both the roof and the walls are built with specified materials known for their capacity to withstand natural elements and durability are denoted as pucca (reflecting durability and, typically better protection against natural elements). For the roof, the listed materials are: tiles, slate or shingle; corrugated iron, zinc or other metal sheets; asbestos sheets; burnt bricks, stone and lime; stone; and RBC/RCC. For the walls, the same materials except tiles, slate or shingle.

As per the 1991 Census, at the all-India level, a little over 30 per cent of the rural households and about 73 per cent of the urban households reside in pucca houses. Across the states, this proportion ranged from 10.5 per cent in Assam to 72 per cent in Punjab in the rural areas. In the urban areas as

30

well, Assam (43 per cent) and Punjab (88 per cent) were the states with, respectively, the lowest and the highest proportion of households living in pucca houses.

At the other end of the spectrum, we have the so called non-serviceable kutcha houses which have thatched roofs and thatch walls, i.e., where the materials used are grass, leaves, reeds etc. Typically, they would be the least durable structures having limited possibilities of repairing - with 'repair' often involving complete replacement of the roof or of the entire structure.[12]

At the all-India level, a little over 9 per cent of the rural households and about 3 per cent of the urban households reside in non-serviceable kutcha houses.

A shade above the non-serviceable kutcha category would be the rest of kutcha houses - with mud walls and thatch roof. At the all-India level, about 25 per cent of rural households and about 7 per cent of urban households reside in such "serviceable" kutcha houses.

Houses not belonging to the kutcha or the pucca categories are labelled semi-pucca. Nearly 36 per cent of the rural households and about 18 per cent of urban households are housed in semi-pucca houses at the all-India level.

Households living in non-serviceable kutcha houses may be deemed to be deprived in terms of the quality of structures used as residential houses. As before, the proportion of households residing in such structure can be used as an indicator of such deprivation. In doing so, however, we have to contend with two problems.

First, in the rural areas of Assam (as well as of other, smaller, states in the North-Eastern region not covered by us) a very large proportion of the rural households are reported to

31

be living in non-serviceable kutcha houses. In rural Assam this proportion is over 67 per cent. As the Census Report has noted, "In North Eastern states most of the houses are built using grass, leaves, reeds, bamboo and wood which are locally available". On the definition used in the Census, a very large proportion of them get classified as non-serviceable kutcha. This illustrates, once again, the limitations attending any uniform classification in a vast country with varying climatic conditions and socio-cultural practices.[13]

The second problem arises in treating only those residing in non-serviceable kutcha houses as being deprived in respect of quality of structures used as residential houses. As is well-known, some at least of the pucca and the semi-pucca structures (by reference only to the materials used) may yet be in a bad condition because of age and/or poor maintenance. Clearly, those residing in pucca or semi-pucca structures in bad condition should also be deemed to be deprived in terms of quality of structures used as residence.

Within the framework of the Census results on Housing and Amenities neither of the problems identified above can be resolved. However, in the results of the NSS 44th Round Survey (July 1988 - June 1989) on Housing condition, we have a basis for addressing the second problem.

The Survey sought to capture, among other things, the prevalence of dwelling units in, what it calls, 'bad condition'. As per the definition adopted in the survey, "if the building requires immediate major repair without which it may be unsafe for habitation and requires to be demolished or rebuilt, it is considered as a bad structure" (Sarvekshana, 1992, p. 43).

We have, from the Survey, estimates of dwelling units in 'bad condition' separately for the pucca, kutcha and semi-pucca

structures.[14] These estimates are available for all the states (and Union Territories) and for all-India, with the rural and the urban areas distinguished in each case.

We combine the Census results on the number of households residing in pucca and semi-pucca houses with the survey-based estimates of the proportion of dwelling units of each type in bad condition to obtain a rough estimate of the number of households living in pucca/semi-pucca dwelling units which are in bad condition.[15] Combining these estimates with the Census estimates of the number of households living in non-serviceable kutcha houses we obtain our final estimates of the total number of households who may be deemed to be deprived with respect to quality of shelter. Estimates of households residing in poor quality structures (as percentages of housed households) are presented separately for the rural and the urban areas for all-India and the major states in Table 10. These are presented in terms of three categories:

    i.   households in non-serviceable kutcha houses;

    ii.   households in pucca and semi-pucca structures that are in bad condition; and

    iii. total, being the sum of (i) and (ii).

Some caution is needed in interpreting these results, especially for Assam, because the problem posed by diversity of local conditions and socio-cultural practices in the application of uniform criteria remains unresolved.[16]

Table 10 : Percentage of Households Residing in Poor Quality Structure in Rural and Urban Areas
All-India and Major States, 1991.

State	RURAL Percentage of Households in			URBAN Percentage of Households in		
	Non-serviceable Kutcha Houses	Pucca & Semi-pucca in bad condition	Total	Non-serviceable Kutcha Houses	Pucca & Semi-pucca in bad condition	Total
Andhra Pradesh	9.17	3.64	12.81	5.52	3.83	9.35
Assam	67.25	0.85	68.10	25.39	2.97	28.36
Bihar	24.20	8.04	32.24	0.59	12.05	12.64
Gujarat	2.16	10.85	13.01	0.98	5.18	6.16
Haryana	0.86	13.61	14.47	0.75	11.61	12.36
Himachal Pradesh	0.33	5.58	5.91	0.44	3.39	3.83
Karnataka	5.57	7.54	13.11	2.81	3.58	6.39
Kerala	7.79	4.34	12.13	6.57	4.03	10.60
Madhya Pradesh	1.20	6.95	8.15	6.79	0.60	7.39
Maharashtra	5.31	9.04	14.35	1.55	8.71	10.31
Orissa	5.70	3.14	8.84	4.10	5.51	9.61
Punjab	1.07	7.05	8.12	0.66	8.15	8.81
Rajasthan	1.59	5.40	6.99	0.52	4.82	5.34
Tamil Nadu	2.65	4.48	7.13	2.98	4.20	7.18
Uttar Pradesh	2.78	5.84	8.62	1.20	9.14	10.34
West Bengal	11.20	7.27	18.47	2.08	18.24	20.32
ALL-INDIA	9.24	6.03	15.27	2.88	7.41	10.29

Source: 1. 1991 Census Report on Housing and Amenities (ORGI, 1994).
2. NSS 44th Round Survey (1988-89) on Housing Condition (Sarvekshana, 1992).

34

Taking the results as a whole, the following points emerge:

1. The extent of deprivation with respect to quality of structures is, in general, lower in urban areas than in the rural areas - with West Bengal and Uttar Pradesh as important exceptions;

2. The above result, in turn, is largely due to the fact that, in almost all cases, the proportion of households in non-serviceable kutcha houses is greater in the rural areas - with Tamil Nadu as an exception;

3. In respect of inter-state variability, the coefficient of variation (cv) is the highest for the proportion of rural households in non-serviceable kutcha houses. In both the rural and the urban areas, the variability (as measured by (cv)) is lower when we include the households living in pucca and semi-pucca structures in bad condition. As is to be expected, the exclusion of Assam lowers the inter-state variability but does not otherwise alter the pattern of such variability.

6 Overcrowding

There are at least two dimensions along which the problem of overcrowding needs to be examined. First, there is the overcrowding within a house typified by several members of a household living in one-room or two-room houses. Secondly, there is the problem of overcrowding in terms of congested localities marked by a very high density of houses.

The primary measurement problem in the second case is the demarcation of well-defined localities in urban areas and hamlets in the rural areas. In the Population Census, the Enumeration Block (EB) is the smallest aerial unit for which Census data are collected. In principle, localities /hamlets can be built up from the EBs. Such an approach, however, would require

35

information on the full count, and tabulations based on sample, even a 20 per cent sample, cannot serve the purpose.

The 44th Round National Sample Survey on Housing Condition (1988-89), however, offers a basis for capturing extreme deprivation in terms of overcrowding along the second dimension. The survey yields estimates of households living in what is called slum/bustee. As the Survey defines it, "slum/bustee is a compact area with a collection of poorly built tenements crowding together usually with inadequate sanitary and toilet facilities" (Sarvekshana, 1992).

Survey-estimates of the proportion of households residing in slum/bustee area, separately for the rural and the urban areas, for all-India and the major states are presented in Table 11.

Table 11 :   Percentage of Rural/Urban Households Living in Slum/Bastee Area,
                1988-89 : All-India and Major States

State	Rural	Urban
Andhra Pradesh	6.68	18.23
Assam	15.03	12.02
Bihar	6.81	15.72
Gujarat	4.65	10.86
Haryana	2.03	4.90
Himachal Pradesh	5.42	4.31
Karnataka	7.38	16.94
Kerala	1.67	4.28
Madhya Pradesh	8.09	18.09
Maharashtra	12.49	25.42
Orissa	6.38	19.07
Punjab	3.47	6.28
Rajasthan	5.36	8.06
Tamil Nadu	6.27	9.23
Uttar Pradesh	3.66	9.53
West Bengal	3.95	17.60
ALL-INDIA	6.25	14.68

Inter-State Variability		
Mean	6.209	12.534
S.D.	3.389	6.141
C.V.(%)	54.58	49.000

Source : NSS 44th Round Survey on Housing Condition (Sarvekshana, 1992)

37

A study of Table 11 reveals the following:

i. The proportion of households living in slum/bustee areas is higher in the urban areas. At the all-India level, while about 6 per cent of the rural households are so affected, nearly 13 per cent of the urban households are living in slum/bustee areas. This broad result is also true for 14 of the 16 major states with Assam and Himachal Pradesh as the two exceptions. Assam also records the highest proportion of rural households living in slum/bustee.

ii. In both rural and the urban areas, Kerala records the smallest proportion of households living in congested locations with a crowding of tenements. Not surprisingly, Maharashtra, which is the most urbanised and industrialised state, has the highest proportion of urban households living in slum/bustee areas.

iii. Inter-state variability, as measured by the coefficient of variation, is lower (albeit marginally so) in the urban areas.

One approach to the measurement of overcrowding within a house would be to categorise households in terms of floor-area per capita, define a normative minimum, and, take the ratio of households falling below the norm to total households. This would be analagous to the headcount ratio in the measurement of poverty.

In principle, this measure is implementable from the data collected in the 44th Round National Sample Survey on Housing Condition. However, the available tabulations only provide estimates of the average area per dwelling unit in the different size-classes of per capita total consumer expenditure (pcte). Currently, in the existing tabulations we do not have estimates of the average floor area per capita in the different pcte-classes.

In the earlier, 38th Round, Survey on Housing Condition (1983) tabulations restricted to the urban areas did provide information on the average floor-area per capita in the different pcte size-classes. However, neither in the 38th Round Survey nor in the 44th Round Survey do we have a distribution of households with per capita floor-area as the ranking variable and the average floor-area per capita in the different size-classes of per capita floor area. It is this latter distribution that is required to implement the suggested measure.

An alternative empirical approximation to overcrowding within a house would be by reference to the number of persons per room. The 1981 Population Census offers a two-way classification of households with the number of persons in the household and the number of rooms in the Census house in which they reside as the two classificatory characteristics. In terms of rooms, the Census distinguishes households with no exclusive room and households with 1,2,3,4,5 and 6 or more rooms (the last as a single group). In terms of number of members of the household, the categories run in terms of 1,2,3,4,5 and an open-ended category of 6 or more persons.

One measure of within-house overcrowding would involve the clubbing together of the following categories of households:

a. all households (in terms of number of persons) with 'no exclusive room';
b. households with three or more persons and living in 1 room; and
c. households with six or more persons and living in 2 rooms.

The ratio of the sum of the households in the above three categories to the total of all housed households can be used as the measure of overcrowding (within a house) in a state.

In visualising the extent of overcrowding implied by the suggested measure it would be useful to keep in mind the census definition of a room. According to the Census: "a room should have four walls with a doorway with a roof over head and should be wide and long enough for a person to sleep in it i.e., it should have a length of not less than 2 metres and a breadth of at least 1.5 metre and 2 metres in height". So that a "room" could have a floor area as small as three square metres. So that an average of three or more persons per room (when they have an exclusive room that is) underlying the suggested measure could imply a per capita floor area of one square metre or less.

According to the 1981 Census, there were about 621,000 rural households and 149,000 urban households who had no exclusive room And, of these, over 82 per cent in rural areas (74 per cent in urban areas) had three or more persons and about one-third of them had 6 or more persons per household. If we consider the households with no exclusive room, the households with 3 or more persons living in 1 room and those with 6 or more persons living in 2 rooms, altogether, they accounted for about 50 per cent of the rural households and about 49 per cent of the urban households.

In Table 12, we present the estimates (based on the 1981 Census) of the proportion of households in the three categories (a) through (c) above and their sum as a measure of within-house over crowding in the different states. Estimates are separately presented for the rural and the urban areas. Since the 1981 Population Census could not be conducted in Assam, the estimates of households affected by overcrowding are not available for that state. (Parallel results based on the 1991 Population Census are not yet available).

Table 12 : Proportion of Households Experiencing overcrowding in the House in 1981 : All India and Major States

| State | RURAL | | | | | URBAN | | | |
| | | | Percentage of Households with | | | | | Percentage of Households with | | |
	No Room	Exclusive	3+ Members in 1Room	6+ Members in 2 Rooms	Overcrowding (2)+(3)+(4)	No Room	Exclusive	3+ Members in 1 Room	6+Members in 2 Rooms	Overcrowding (2)+(3)+(4)
(1)	(2)		(3)	(4)	(5)	(6)		(7)	(8)	(9)
Andhra Pradesh	Neg.		48.56	10.46	59.02	Neg.		39.69	10.97	50.66
Assam	N.A.		N.A.	N.A.	N.A.	N.A.		N.A.	N.A.	N.A.
Bihar	0.67		29.67	15.70	46.04	0.89		25.64	16.40	42.93
Gujarat	0.31		48.88	16.72	65.91	0.20		36.84	15.17	52.21
Haryana	0.07		23.37	19.28	42.72	0.10		28.67	15.33	44.10
Himachal Pradesh	0.20		25.24	15.70	41.16	0.23		19.86	8.69	28.78
Karnataka	0.87		33.88	16.83	51.58	0.75		35.84	18.08	54.67
Kerala	0.19		16.30	14.23	30.72	0.24		12.89	12.74	25.87
Madhya Pradesh	0.07		32.57	15.20	47.84	0.09		25.18	14.48	39.75
Maharashtra	6.06		51.27	9.48	66.81	2.55		50.63	9.33	62.51
Orissa	0.06		25.08	15.02	40.16	0.06		26.60	13.55	40.21
Punjab	0.04		28.20	19.78	48.02	0.05		27.35	15.15	42.55
Rajasthan	0.08		31.32	16.01	47.41	0.15		29.06	14.70	43.91
Tamil Nadu	Neg.		48.47	9.36	57.83	0.01		39.20	10.75	49.96
Uttar Pradesh	0.10		22.32	13.92	36.34	0.12		29.61	15.57	45.30
WestBengal	0.10		48.76	16.18	65.04	0.05		38.88	12.66	51.59
ALL-INDIA	0.69		35.50	14.04	50.23	0.52		34.88	12.91	48.31

Source : Computed from Census of India 1981, Series 1, India, Part VIII A&B (ii) Household Tables (HH-2 to 4), Delhi, 1987.

Some of the highlights of the estimates in Table 12 are:

1. In both the rural and the urban areas, Maharashtra has the highest proportion of households with no exclusive room as well as of households with 3 or more persons living in a single room. Taking the three categories together also, Maharashtra has the highest proportion of households suffering from overcrowding.

2. As in the case of overcrowding in terms of households living in slum/bustee, in both rural and the urban areas, Kerala has the lowest proportion of households suffering from within-house overcrowding.

3. Except in Haryana, Karnataka and Uttar Pradesh, the proportion of households suffering from overcrowding is greater in the rural areas than in the urban areas.

It must be stressed that the above results relate to 1981. The 1991 Census results on the distribution of households by number of rooms (but not categorised by number of persons in the household) are available only at the all-India level. These results show a decline in the proportion of households with no exclusive room and in that of households living in a single room, and, an increase in the corresponding proportions of households with 2,3,4 and 5 or more rooms. This would suggest an improvement in the situation. However, in the absence of the two-way classification (as in the 1981 Census), we cannot be sure that there has been a decline in the proportion of households suffering from overcrowding between 1981 and 1991.

7 An Index of Shelter-Deprivation

In the earlier sections we have discussed different facets of shelter-deprivation covering houselessness; amenities-deprivation (individually and as a composite index); quality of housing structures and two dimensions of overcrowding

42

relating, respectively, to crowding/congestion in the locality and overcrowding within the house. In this section, we seek to bring together the different facets of shelter deprivation into a single composite index.

Let us begin by recalling that in respect of each and all of the facets of shelter-deprivation discussed in the earlier sections we have used the number of affected households (taken as a ratio of all households) as the indicator. This is the case even in respect of our index of amenities-deprivation. Given this, any weighted average of the percentage(s) of households affected by the different facets of shelter-deprivation can serve as a composite index.

It needs to be emphasised that while it is possible to motivate the broad pattern of weights to be assigned to the different components, the assignment of a particular set of numbers as weights is an inherently arbitrary exercise.

As for the broad pattern of weights, there will be general agreement that the most extreme form of shelter-deprivation, namely, houselessness should have the largest weight in any index of shelter-deprivation.

Turning next to the other indicators - all of which reflect facets of deprivation among housed households -it would appear reasonable that our composite index of amenities-deprivation should have a larger weight than either structure quality or the two dimensions of overcrowding. While there are no obvious grounds for differentiating between overcrowding within the house and deprivation with respect to quality of housing structure, crowding at the locality-level may be assigned a somewhat lower weight. This follows from the fact that, given the survey-definition of slum/bustee, the households in this category will, almost certainly, be figuring in one or more of the other

facets of shelter-deprivation as well. So that, the weights for congestion at the locality-level will be additional to those under other heads.

Keeping in view the above considerations, in constructing our composite index of shelter-deprivation we have assigned a weight of 50 per cent to houselessness, 25 per cent to amenities-deprivation; 10 per cent each to deprivation in respect of structure quality and overcrowding within the house. Residually, a weight of 5 per cent is assigned to crowding at the locality-level.

In carrying out this exercise for all-India and the major states, we had to omit Assam. This omission was dictated by two considerations. First, since the 1981 Population Census could not be conducted in Assam, we do not have any estimate of the households affected by overcrowding within the house for that state. Secondly, as we noted earlier, the estimated number of households affected by poor quality structure of housing is coloured by the local socio-cultural practices resulting in an unduly high proportion of households living in the so-called non-serviceable kutcha houses as per the Census definition.

Table 13 brings together (from the earlier sections) the estimates (for the rural population) of households affected by different facets of shelter-deprivation taken as a percentage of all households. From this, and the structure of weights indicated above, a composite index of shelter-deprivation is presented for all-India and 15 major states. Table 14 presents parallel results for the urban population.

Table 13 : Shelter-Deprivation in Rural India, 1991 Component Indicators and a Composite Index.

State	Pecentage of Households Affected by					Index of Shelter Deprivation
	Houselessness	Amenities Deprivation	Poor Quality Structure	Overcrowding Locality Level	Within House	
Andhra Pradesh	0.26 (10)	27.48 (10)	12.81 (9)	6.68 (11)	59.02 (12)	14.52 (12)
Bihar	0.06 (1)	32.79 (14)	32.24 (15)	6.81 (12)	46.04 (6)	16.40 (15)
Gujarat	1.03 (14)	21.20 (5)	13.01 (10)	4.65 (6)	65.91 (14)	13.94 (10)
Haryana	0.21 (7)	19.42 (3)	14.47 (13)	2.03 (2)	42.72 (5)	10.78 (4)
Himachal Pradesh	0.23 (8)	13.23 (2)	5.91 (1)	5.42 (8)	41.16 (4)	8.40 (1)
Karnataka	0.29 (11)	22.89 (7)	13.11 (11)	7.38 (13)	51.58 (10)	12.71 (6)
Kerala	0.12 (5)	20.18 (4)	12.13 (8)	1.67 (1)	30.78 (1)	9.47 (3)
Madhya Pradesh	0.39 (13)	29.18 (11)	8.15 (5)	8.09 (14)	47.84 (8)	13.65 (8)
Maharashtra	1.08 (15)	21.98 (6)	14.35 (12)	12.49 (15)	66.81 (15)	14.78 (14)
Orissa	0.15 (6)	34.71 (15)	8.84 (7)	6.38 (10)	40.16 (3)	13.97 (11)
Punjab	0.25 (9)	10.68 (1)	8.12 (4)	3.47 (3)	48.02 (9)	8.58 (2)
Rajasthan	0.30 (12)	31.50 (12)	6.99 (2)	5.36 (7)	47.41 (7)	13.73 (9)
Tamil Nadu	0.07 (3)	23.38 (8)	7.13 (3)	6.27 (9)	57.83 (11)	12.69 (5)
Uttar Pradesh	0.07 (4)	32.15 (13)	8.62 (6)	3.66 (4)	36.34 (2)	12.75 (7)
West Bengal	0.07 (2)	24.14 (9)	18.47 (14)	3.95 (5)	65.04 (13)	14.62 (13)
ALL-INDIA	0.27	27.10	15.27	6.25	50.23	13.77
Weights Used in Index	50	25	10	5	10	100
C.V. (%)	101	28	52	46	22	18
Rank Correlation Coefficient	0.025	0.654	0.593	0.529	0.454	-

Notes : Except for Houselessness, the percentages are to the total 'housed' households. In the case of Houselessness, the denominator is the sum of the Houseless and the Housed Households.

Figures in brackets indicate the rank-order position of the states when the states are arranged in Ascending order of deprivation on the variable under reference.

For ranking purposes, we have considered the percentages upto 5 decimal places.

C.V. - refers to coefficient of Variation used as a summary measure of Inter-State Variability.

Rank Correlation Coefficient - reflects the extent of correlation of the rank-order position of the State in respect of the variable vis-a-vis the rank-order position of the State by reference to the composite index.

Table 14 : Shelter-Deprivation in Urban India, 1991 Component Indicators and a Composite Index.

| State | Percentage of Households Affected by | | | | | Index of Shelter Deprivation |
	Houselessness	Amenities Deprivation	Poor Quality Structure	Overcrowding Locality Level	Within House	
Andhra Pradesh	0.80 (13)	10.44 (12)	9.35 (8)	18.23 (13)	50.66 (11)	9.92 (10)
Bihar	0.39 (5)	13.30 (14)	12.64 (14)	15.72 (9)	42.93 (6)	9.86 (12)
Gujarat	0.69 (12)	6.72 (6)	6.16 (3)	10.86 (8)	52.21 (13)	8.41 (6)
Haryana	0.27 (2)	4.9 (3)	12.36 (13)	4.90 (3)	44.10 (8)	7.26 (4)
Himachal Pradesh	0.90 (15)	4.16 (2)	3.83 (1)	4.31 (2)	28.78 (2)	4.97 (1)
Karnataka	0.60 (10)	8.23 (7)	6.39 (4)	16.94 (10)	54.67 (14)	9.31 (11)
Kerala	0.29 (3)	9.97 (11)	10.60 (12)	4.28 (1)	25.87 (2)	6.50 (3)
Madhya Pradesh	0.58 (9)	10.77 (13)	7.39 (6)	18.09 (12)	39.75 (3)	8.60 (7)
Maharashtra	0.66 (11)	5.65 (4)	10.31 (10)	25.42 (15)	62.51 (15)	10.30 (15)
Orissa	0.85 (14)	14.54 (15)	9.61 (9)	19.07 (14)	40.21 (4)	10.00 (13)
Punjab	0.39 (4)	3.09 (1)	8.81 (7)	6.28 (4)	42.55 (5)	6.55 (3)
Rajasthan	0.46 (6)	8.49 (8)	5.34 (2)	8.06 (5)	43.91 (7)	7.68 (5)
Tamil Nadu	0.20 (1)	9.40 (9)	7.18 (5)	9.23 (6)	49.96 (10)	8.63 (8)
Uttar Pradesh	0.51 (7)	9.42 (10)	10.34 (11)	9.53 (7)	45.30 (9)	8.65 (9)
West Bengal	0.58 (8)	6.58 (5)	20.32 (15)	17.60 (11)	51.59 (12)	10.01 (14)
ALL-INDIA	0.55	8.35	10.29	14.68	48.31	8.96
Weights Used in Index	50	25	10	5	10	100
C.V. (%)	38	37	41	50	20	18
Rank Correlation Coefficient	0.271	0.350	0.414	0.875	0.596	-

Notes : As in Table 13.

The following points emerge from an analysis of Tables 13 and 14.

1. In each of the 15 major states and at the all-India level, overall shelter-deprivation as measured by our composite index is higher in rural areas than in the urban areas. This is despite the fact that the proportion of houseless households and locality-level congestion is typically higher in the urban areas.

2. Underlying the first result is a greater level of amenities-deprivation and a generally greater measure of crowding within the house in the rural areas. The greater level of amenities-deprivation, in turn, reflects the access of a much smaller proportion of rural households to the three amenities, singly and jointly, relative to their urban counterparts. This rural-urban gap is, in general, the least in respect of access to safe drinking water and the widest in respect of toilet facilities.

3. Viewed across states, overall shelter deprivation among rural households is the greatest in Bihar with Orissa recording the next highest level of shelter-deprivation. At the other end of the scale, shelter-deprivation is the least in Himachal Pradesh, followed by Punjab, Kerala and Haryana in (ascending) order of deprivation. Among the urban households, the dubious distinction of recording the highest level of overall shelter-deprivation goes to Maharashtra with West Bengal being only marginally better-off. Himachal Pradesh once again records the lowest level of shelter-deprivation. With a slight reversal of ranks, Kerala, Punjab and Haryana - in that order - follow Himachal Pradesh.

4. In both the rural and the urban areas, inter-state variability in overall shelter-deprivation, as measured by the coefficient of variation, is fairly low at about 18 per cent. Per contra, the inter-state variability in the prevalence of houselessness is quite high especially in rural areas (cv = 101 per cent).

5. Finally, a rank-ordering of the states (in ascending order of deprivation) by reference to the composite index and the component indicators shows that the rank-ordering on the composite index is best correlated with the index of amenities-deprivation in rural India. In the case of urban areas, the ordering on the indicators of crowding correlate well with the rank-ordering based on the composite index. Interestingly, despite the high weight attached to it, the rank-ordering of states based on the level of houselessness does not correlate well with the ordering based on the composite index of shelter-deprivation.

END NOTES

1. The oft-used Hindi phrase "Roti, Kapada aur Makaan" (roughly translatable as 'bread, clothes and house') to describe man's basic needs, captures this common perception.

2. These facets, together with the state of repair and stability or, conversely, the state of dilapidation of the structure have been listed as factors which have to be taken into account in deciding whether a building is "unfit for human habitation" as per the (Indian) Slum Areas Act of 1956.

3. See, ORGI (1994). This has been supplemented by an additional table on the proportion of households relying on "wells within the premises" as the source of drinking water. This has been supplied to us by ORGI.

4. See, Sarvekshana, 1992.

5. The focus here, is on residence in a structure with walls and roof. In particular, the term "houselessness" is not used by reference to the ownership of the structure.

6. For example, a structure erected on pavements with only tin-sheets for "walls" and with sacks for a "roof" will qualify for being enumerated as a Census "house" and the household residing therein will be counted among the "housed" population.

7. Though in the Census definition of house the materials used is irrelevant, the Census offers an elaborate classification of houses by reference to the materials used for roof, walls and the floor. Later in our discussion, we shall in fact use this classification to derive one indicator of deprivation of the housed population.

8. At this point in the instructions the Census uses the term homeless interchangeably with the houseless. But, since the term homeless has other connotations especially for the children, we have substituted what in our view is the more appropriate term for the focus of this chapter, namely the houseless.

9. In defining the total households as the sum of the housed plus the houseless households we are ignoring the so called "Institutional Households". This has become necessary for reasons of comparability as the details on such institutional households are not available for 1991.

    The Census has the following to offer by way of explanation of institutional households:

    "Examples of unrelated households are boarding houses, messes, hostels, residential hotels, rescue houses, Jails, Ashrams etc. These are called "institutional households'. There may be one-member households, 2-member households or multi-member households. For Census purposes each one of these is regarded as a household.

    If a group of persons who are unrelated to each other live in a Census house but do not have their meals from the common kitchen, they would not constitute an institutional household", see ORGI (1985).

10. The term "housed households" excludes two categories of households: (i) the so called "Institutional Households" and (ii) the houseless households. The Census Report does not use the prefix "housed" in presenting the information. We have used it to clarify the coverage.

11. If we had accepted the categorisation of safe sources of drinking water used in the Census Report, then, the directly available estimate of the proportion of households enjoying all the three amenities simultaneously (P_{123}) can be used as a consistency check on the derived estimates for NP_{12}, NP_{13}, NP_{23}, NP_1, NP_2 and NP_3 and the estimated value for NP_{123}. We have carried out this consistency exercise and the results do check-out.

12. It must be stressed that the serviceability in terms of its ability to protect the resident against natural elements will be a function of the climatic conditions.

13. The very low proportion of households in Kerala reporting access to safe drinking water on the Census categorisation of safe sources (see section 3) is the other important illustration of the limitations of adopting a uniform categorisation for the whole of India.

14. The definitions used in the Survey to categorise structures into pucca, kutcha and semi-pucca broadly correspond to the definitions used in the Population Census.

15. Notice that the Survey results relate to dwelling units and not households living in structures in bad condition. We know, from the 1991 Census Report on Housing and Amenities, that the number of the (housed) households exceed the number of residential houses by about 3 per cent in rural India and by 2 per cent in urban India. So that some households share houses.

    In applying the survey estimates of the proportion of dwelling units in bad condition (among pucca/semi pucca structures) to the Census estimates of the number of households by type of structure, the implicit assumption is that the extent of house-sharing is not differentially distributed as between structures in good and bad condition. Given the available data, this assumption is neither verifiable nor avoidable.

16. It might be suggested that, in this case too, we could have used the survey results on the proportion of kutcha dwelling units in bad condition. In the case of rural Assam this would have resulted in a substantially smaller, and thence, more plausible estimate of households deprived on this count. However, at the all-India level and in the case of most of the states, the survey estimates of the proportion of kutcha houses in bad condition are in excess of the Census estimates of the proportion of households in non-serviceable kutcha houses to those in all kutcha houses.

    We have preferred to stay with the Census estimates for two reasons:

    First, they are based on a detailed classification of the materials used for the walls and the roof. Secondly, and perhaps more importantly, the Census results are based on a 20 per cent sample while in the National Sample Survey, the surveyed households would be about 1 per cent of the total.

Data Sources

I. Population Census

1. Office of the Registrar-General of India (ORGI), 1985: <u>Census of India 1981, Series 1, India, Part II·A (i)·, General Population Tables</u>, New Delhi, Appendix 3, Houseless and Institutional Population.

2. ORGI, 1987a: <u>Census of India 1981, Series I, India, Part VIII·A and B (ii), Household Tables (HH - 2 to 4)</u>, New Delhi, HH-2: Households by Size of Household and Number of Rooms Occupied.

3. ORGI, 1987(b): <u>Census of India 1981, Series I, India, Part VIII·A and B(v), Household Tables</u> (HH 6-9 and HH 11-12), New Delhi, HH-7: Households by Source of Drinking Water.

4. ORGI, 1992: <u>Census of India 1991, Series I, India, Paper 2 of 1992, Final Population Totals: Brief Analysis of Primary Census Abstract</u>, New Delhi

5. ORGI, 1993, <u>Census of India 1991, Series I, India, Paper 1 of 1993, Union Primary Census Abstract for Scheduled Castes and Scheduled Tribes</u>, New Delhi.

6. ORGI, 1994: <u>Census of India, 1991, Series I, India, Paper 2 of 1993, Housing and Amenities : A Brief Analysis of the Housing Tables of 1991 Census</u>.

II. National Sample Surveys

7. NSSO, 1992, "NSS 44th Round (July 1988 - June 1989), Survey on Housing Condition : A Note and Survey Results", <u>Sarvekshana</u>, Vol. XV, No. 3, Issue No. 50, January-March, New Delhi.

CENTRE FOR DEVELOPMENT ECONOMICS
WORKING PAPER SERIES

No.	Author(s)	Title
1	Kaushik Basu Arghya Ghosh Tridip Ray	The Babu and The Boxwallah : Managerial Incentives and Government Intervention (Jan 1994)
2	M.N. Murty Ranjan Ray	Optimal Taxation and Resource Transfers in a Federal Nation (Feb 1994)
3	V. Bhaskar Mushtaq Khan	Privatization and Employment : A Study of The Jute Industry in Bangladesh (Mar 1994)
4	V. Bhaskar	Distributive Justice and The Control of Global Warming (Mar 1994)
5	Bishnupriya Gupta	The Great Depression and Brazil's Capital Goods Sector : A Re-examination (Apr 1994)
6	Kaushik Basu	Where There Is No Economist : Some Institutional and Legal Prerequisites of Economic Reform in India (May 1994)
7	Partha Sen	An Example of Welfare Reducing Tariff Under Monopolistic Competition (May 1994)
8	Partha Sen	Environmental Policies and North-South Trade : A Selected Survey ofThe Issues (May 1994)
9	Partha Sen Arghya Ghosh Abheek Barman	The Possibility of Welfare Gains with Capital Inflows in A Small Tariff-Ridden Economy (June 1994)
10	V. Bhaskar	Sustaining Inter-Generational Altruism when Social Memory is Bounded (June 1994)
11	V. Bhaskar	Repeated Games with Almost Perfect Monitoring by Privately Observed Signals (June 1994)
12	S. Nandeibam	Coalitional Power Structure in Stochastic Social Choice Functions with An Unrestricted Preference Domain (June 1994)
13	Kaushik Basu	The Axiomatic Structure of Knowledge And Perception (July 1994)
14	Kaushik Basu	Bargaining with Set-Valued Disagreement (July 1994)

No.	Author(s)	Title
15	S. Nandeibam	A Note on Randomized Social Choice and Random Dictatorships (July 1994)
16	Mrinal Datta Chaudhuri	Labour Markets As Social Institutions in India (July 1994)
17	S. Nandeibam	Moral Hazard in a Principal-Agent(s) Team (July 1994)
18	D. Jayaraj S. Subramanian	Caste Discrimination in the Distribution of Consumption Expenditure in India: Theory and Evidence (August 1994)
19	K. Ghosh Dastidar	Debt Financing with Limited Liability and Quantity Competition (August 1994)
20	Kaushik Basu	Industrial Organization Theory and Developing Economies (August 1994)
21	Partha Sen	Immiserizing Growth in a Model of Trade with Monopolisitic Competition (August 1994)
22	K. Ghosh Dastidar	Comparing Cournot and Bertrand in a Homogeneous Product Market (Sept. 1994)
23	K. Sundaram S.D. Tendulkar	On Measuring Shelter Deprivation in India (Sept. 1994)
24	Sunil Kanwar	Are Production Risk and Labour Market Risk Covariant? (Oct. 1994)
25	Partha Sen	Welfare-Improving Debt Policy Under Monopolistic Competition (Nov. 1994)