

STATUS OF HOUSING AND BASIC AMENITIES IN ASSAM

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The paper has drawn inferences that poor housing leads to poor health outcome. Moreover, housing and living indicators are positively associated with overall development outcomes in the districts of Assam. In addition to these, certain indicators (use of fire-wood, water sources) bring in the issue of time-use pattern of women more particularly in rural households; capable to induce negative externalities on health front to time devoted to children. Structural indicators on housing and basic facilities reflect significant spatial variations and there is emergence of some clear clusters of underperformance (districts dominated by religious minority people and sixth schedule areas) in the state.

Research Paper Series 09/2013

Status of Housing and Basic Amenities in Assam[#]

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[#] This paper is part of the Research Series on Status of Children in Assam funded by UNICEF, Field Office, Guwahati.

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August, 2013

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Published by OKDISCD
Printed at Dristi Solutions, Panbazar, Guwahati

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Introduction

A congenial environment at home ensures wellbeing and development of children to a large extent. Home environment on the other hand is influenced by parental income as well as attitudes and approach of parents towards their wards*. A good house –own or rented, which is largely outcome of a decent source of income of parents influence children’s upkeep and development (Vandivere et al, 2006). Maslow (1948) too argues on the importance of adequate housing as the most basic of all for children’s positive development.

Poor housing could exhort certain environmental conditions causing and aggravating the symptoms of asthma, the most common chronic disease among children (Breyse et.al 2004). Poor ventilation and indoor moisture and dampness sustain certain bacteria which can help set off asthma attacks (Brunekreef et al, 1989). Children’s asthma and poor housing could be highly associated and children with asthma might experience multiple health risks if they are also exposed to toxic pesticides that were intended to combat rodents or insects. In addition to asthma and respiratory distress poor physical quality of housing may lead to accidents, injury or even death. All of these hazards are preventable and treatable, but if unaddressed, not only can lead to significant health care costs for the household (Vandivere et. al.2006), it also has effect on human capital formation†.

Information on housing circumstances is in general available only for households as a whole, and focus is not placed on children. It could be useful to have an estimate on the proportion of children living in poor and dilapidated houses without any basic amenities. Brooks-Gunn et al (1997) wrote that low-income families are likely to experience housing problems due to their financial limitations. In the extreme circumstance of homelessness, children are likely to experience hunger and poor health (Better Homes Fund, 1999). The physical quality of the home would tend to make an impact on infants more strongly than older children (Gephart, 1997). Overall housing indicators would overall reveal economic progress in a space and subsequent wellbeing of children.

* This paper however is not intended to address issues on behavioural approaches of parents towards their wards. We have no indication on this from the available secondary data.

† Housing has a direct impact on an individual’s employment and income generating capabilities –extracted presentation made by National Housing Bank of India at workshop on housing finance Mangolia, June 28,2011; available at the website of Asia Pacific Union for Housing Finance. This outcome is not well researched, though there are enough studies on housing and educational outcome indicators.

Housing too affects health and emotional well being of elderly people and earning members in the family. Bad health and mental state could hinder parenting abilities, which in turn have serious repercussion on children (U.S. Conference of Mayors 2005). Moreover, unaffordable housing (high rent) also could limit parents' ability to afford basic necessities for children, such as foods, clothing and education. This indirect effect also has very serious consequences for children (Bratt 2002; Rohe et al 2000).

While high housing costs result in financial burden, it is also possible that some families choose to pay a large portion of their incomes in order to obtain good quality housing in good neighborhoods. This trade-off may be responsible for some of the mixed findings in research about the way that high housing costs affect children's well-being (Vandivere et.al 2006). Saegert and Evans (2003) argue that if parents are forced to make fewer "tradeoffs" when it comes to housing, wellbeing of the children could be enhanced to large extent. In this context it would be useful to have a review of housing & habitat policy and programmes and capture perceptions of the state on housing as a determinant of wellbeing.

In a welfare state housing programme for the poor is largely appreciated. The problem of providing affordable housing and infrastructure to the economically weaker sections of the population in developing countries was the focal theme of the 7th International Congress on human settlements in developing countries (Calcutta, 1993). The conference unanimously agreed that there is an urgent need to introduce more income generation schemes for the economically weaker sections of the urban population so that these households are able to afford housing and basic services (Bhattacharya, 1994). It may be noted that the problem in rural housing often does not get the attention to the policy makers. There is belief that the housing problem deserves attention primarily in urban areas where the problems of congestion and unhealthy surroundings are acute. As rural areas are free from these, rural housing does not pose any serious problem. In such circumstances it would be useful to have a status on rural housing and rural housing programme†.

Focus of the paper

Based on certain indicators (structural as well as basic provisioning for good living) this paper tries to assess how livable our homes and quality of living. Overall from the available Census of India data inferences are drawn on quality of living in the state. Regional variations and certain spatial issues within the state are considered to

† According to the Estimates Committee (1985-86), this also reflects the indifference of the government towards the rural housing problem. Refer to the report of "Thirty Second Report, Estimates Committee (1985-86)", Eighth Lok Sabha, on Housing for Landless Rural Labour, Ministry of Urban Development, Lok Sabha Secretariat, New Delhi, 1986. We however see changes in perception of state to understand the severity of the issue with the initiations of housing programmes in the country.

understand the prevailing constraints of underperformance in attaining quality of living.

The paper has drawn some inference that poor housing leads to poor health outcome. There is also scope to argue that poor housing and living indicators in the districts of the state are positively related to the overall development outcomes in the districts (Assam Human Development Report, 2003). In addition to this analysis of certain indicators (use of firewood and other unclean energy) bring in the issues of time-use pattern of women more particularly in rural households of the state and all induce negative externalities (health outcome to sparing and devoting time to children); would require to undertake detailed field based studies.

It is right that certain indicators on quality front cannot be compromised. For example classification of water sources to define as safe sources would require stringent qualification. Such approach only will raise the yardstick; and challenges and effort of the State to ensure water quality. This would induce positive fallouts in the long run.

On policy front the analysis may open up the challenges of the State to ensure a decent housing standard for the people both in rural and urban areas. The paper also reviews policy, finance and interventions on housing in India and assumes that right policies, rational plans and efforts in implementation would help to raise the coverage level of all sets of housing indicators.

Analytical assessment

A. *Are our homes livable?*

The Census of India, 2001 added a question in the household schedule to understand to what extent our residential houses are livable. Census of India (2001) however stated that as local conditions vary from place to place and even in rural and urban areas, it was not considered feasible to give any single comprehensive definition for the terms used to determine the conditions of Census house. The condition of census houses was recorded good, livable or dilapidated based on the perception and response of the respondents (p77).

Overall house listing operations of Census 2001 saw a major shift in approach, though in a rudimentary form to emphasis on quality of living of the households rather than just housing. Still, we have ample numbers of indicators to get an overall status on living of people and probable impact of quality housing and basic infrastructures on children[§].

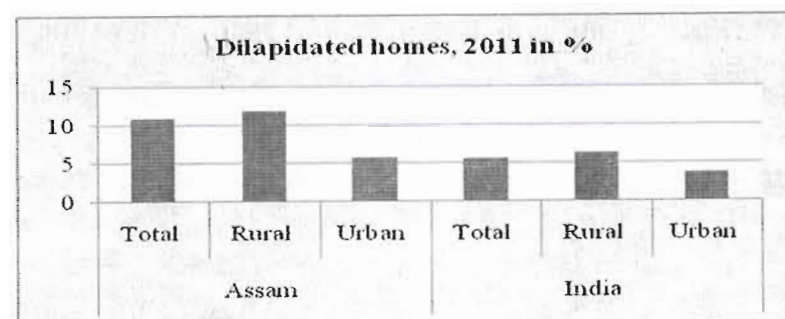
[§] Macro level data of Census of India on housing raise enough issues to be inferred. Comprehensive understanding is possible once we address these through field based studies.

The Census of India, 2001 returned that altogether 50.2 percent households are good, 44.3 percent are livable and 5.5 percent are dilapidated in the country. These figures for Assam were 28.5 percent, 61.3 percent and 10.2 percent respectively. The proportion of dilapidated households in the state (10.9 percent) in 2011 however did not show a decline. There is improvement in urban houses but conditions of rural houses deteriorated in the state of Assam (Table 1).

Table 1: Good and livable houses in India and Assam

		2011			2001		
		Good	Livable	Dilapidated	Good	Livable	Dilapidated
Assam	Total	32.8	56.4	10.8	28.5	61.3	10.2
	Rural	27.9	60.3	11.8	24.5	64.7	10.9
	Urban	58.9	35.4	5.7	52.0	41.5	6.5
India	Total	50.2	44.3	5.5	50.2	44.3	5.5
	Rural	44.8	48.9	6.2	44.8	51.0	6.2
	Urban	64.2	32.2	3.6	46.1	50.3	3.6

Sources: Census of India – Tables on houses, household amenities and assets



District wise figures and trend show that certain districts in the state (Dhubri, Barpeta, Marigaon, Darrang, Karimganj and Hailakandi) show concentration and further deterioration of condition in dilapidated households during the period 2001-2011 (Appendix table 1). It can be noted that these districts have concentration of people belonging to minority religion. Moreover, these districts are severely affected by flood during monsoon period. In addition to these districts, the districts having more concentration of dilapidated households than the average of the state, either have concentration of religious minority people (more than 30 % of the population) or belong to areas of sixth schedule of the Constitution (figure 1). In the following parts of this paper we shall observe that good housing indicators are in dismal in these districts of the state.

Housing shortage as per the estimation of Census of India 2001 was 2.24 millions in rural areas of Assam (Working Group on Rural Housing for the 11th Plan, Ministry of Rural development, Government of India). This figure includes along with the dilapidated houses (about 4.5 lakh houses in rural areas in 2001 were dilapidated), congestions in other category households. To this figure and that there are 26.8 million rural populations in Assam (2011 census), shelter or housing of about 42 percent people in rural Assam is in bad state. Data overall reveal daunting task for the state to ensure a decent housing standard for the people both in rural and urban areas.

The crisis of housing in urban areas has become deeper over the years. Crisis in the rural economy has resulted in outflow of people to urban areas. This accentuated the demand for housing in urban areas. Data reflects that the demand for housing in urban areas is rising and the gap of shortage is increasing over the years. In 1991 housing shortage in urban India was 8.2 million dwelling unit, increased to 8.9 million in 2002 (10th Plan working group report, Planning Commission quoted from Press Information Bureau-Housing Shortage in India).

Structure of housing is only a partial explanation of good living. The 2001 census had added some new questions on housing; number of items on which information was collected increased from 22 in 1991 to 33 in 2001. Some of the new information collected were connection of wastewater outlet to open or closed drainage, availability of bathroom and kitchen within the house, availability of certain assets such as radio, televisions, two wheelers and car etc. These additional coverage were in the line of UN recommendation to look at the various aspects of quality of living (Census of India, 2001: 52). Such indicators help us to draw inferences on quality of living**.

B. Assessing livability of homes from structural safety

Household with safe structures

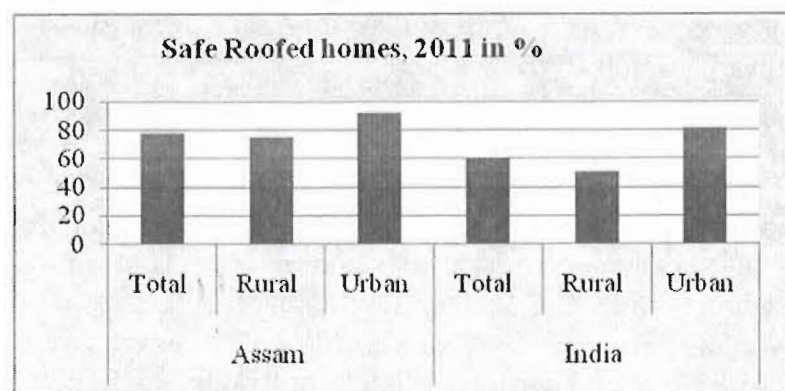
Permanent roofs, wall and hygienic floors are important constituents which make the homes safe and livable. Roofs of a house can be considered permanent if roofs are of reinforced concrete constructions (RCC) or have galvanized, metal or asbestos sheets. To the census of 2011 data in Assam 77.1 percent households had safe structures. This figure for rural areas was 74.4 percent and in urban areas was 92 percent. In 2001 overall just 47.1 percent households used safe materials in their roofs in Assam and this figure was 41.4 percent in rural areas and 84.8 percent in urban areas. Overall we see

** Household income is considered as a adequate indicator of household welfare. There are also arguments that welfare results from accumulation of households assets. Sherraden (1990) suggests that assets yield number of welfare effects apart from deferred consumptions, and these welfare effects may be quite important in reducing poverty. We see scopes to address such issues in our context.

significant improvement in the use of safe roofing materials, particularly of GI, metal and asbestos sheets used in the rural households during past 10 years.

Table 2: Households with safe roofs

		2011			2001		
		GI/metal/asbestos	RCC	Total	GI/metal/asbestos	RCC	Total
Assam	Total	73.3	3.8	77.1	45.8	1.9	47.7
	Rural	73.6	0.8	74.4	41.1	0.3	41.4
	Urban	72.4	19.6	92.0	73.4	11.4	84.8
India	Total	15.9	44.2	60.1	12.2	33.7	45.9
	Rural	15.9	34.3	50.3	10.5	24.2	34.7
	Urban	15.8	65.2	81.1	16.6	57.5	74.1



We do not see positive association between safe roofed homes and livable homes. The districts which show high proportion of dilapidated houses, some of them (Dhubri, Barpeta) have shown use of high proportion of safe roof materials. Data show that certain cluster of districts –irrespective of their state of development (HDI rank, Assam Human Development Report, 2003), show high proportion of use in safe materials in the roof of the households. Moreover, the rural urban gap in case of use of permanent materials as roofs is less related to other indicators of housing status. In fact in case of the indicator of safe materials on the roof of the households, Assam performs better than the country average. As indicated in the table 2 this is largely because of use of GI/metal or asbestos sheets.

Roof is however not the single determinant that make a house safe on structural front. Wall of the houses is also an important consideration. Census of 2011 reflects that just 24 percent houses in Assam have permanent wall made of burnt brick and concrete. This figure for rural areas is 18.7 percent and for urban areas in 52.6 percent. This is however of some improvement from 2001 census which returned 18.3 percent households with permanent materials in wall (rural 13.3 and urban 47.6 percent).

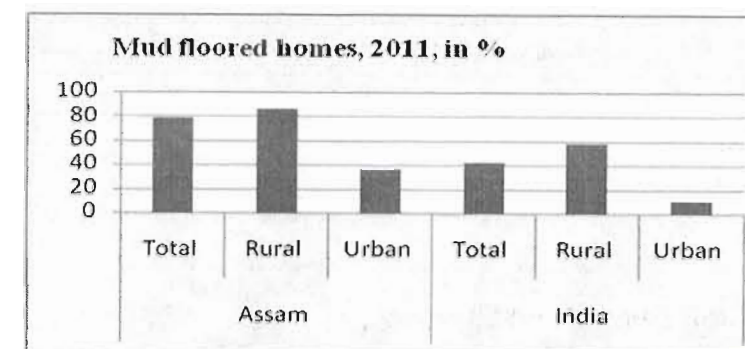
Table 3: Households with safe wall

		2011			2001		
		Burnt bricks	Concrete	Total	Burnt bricks	Concrete	Total
Assam	Total	21.1	2.9	24.0	16.1	2.2	18.3
	Rural	17.1	1.6	18.7	12.1	1.2	13.3
	Urban	53.2	9.4	62.6	39.6	8.0	47.6
India	Total	47.5	3.5	51.0	44.9	2.6	47.5
	Rural	40.0	1.7	41.7	35.3	1.3	36.6
	Urban	63.5	7.2	70.7	68.7	5.9	74.6

On the other hand in 2011, 78.4 percent homes in Assam had mud floor. This figure for rural areas was 86.2 percent and urban areas 36.3 percent. The figures of 2011 are some improvement over the figures of 2001 census (83.5 percent overall, 90.1 percent in rural areas and 44.6 percent in urban areas).

Table 4: Households with mud floor

		2011		2001	
		Mud	Wood/Bamboo	Mud	Wood/Bamboo
Assam	Total	78.4	2.1	83.5	2.2
	Rural	86.2	2.4	90.1	2.4
	Urban	36.3	0.6	44.6	0.7
India	Total	41.9	0.8	54.9	0.9
	Rural	57.7	0.9	70.3	1.0
	Urban	10.2	0.4	16.7	0.6



Should we consider mud floor as an unsafe and unhygienic indicator? Proportion of rural households with mud floors in the districts of Assam shows positive association with chronic asthma among rural population and of rural females (Annual Health Survey of Assam, 2010-11; RGI and Census Commissioner of India). We have district wise information on prevalence of chronic asthma and correlating these data with proportion of mud floored households we get positive association.

There are also households with non-permanent nature of floor made of wood and bamboo. Use of wood and bamboo as floor are because of cultural consideration in some localities (Mishing community in Dhemaji district is one of such examples); however cannot be considered as unsafe or unhygienic. This brings in locality specific considerations in assessing housing standards.

Among the structural components of housing - roofs show better indication. There are certain explanations on roof showing better indication compared to other structural indicators in housing. There is scope to assume that people in constraint financial situation prioritise for a safe roof over their heads! People prioritise on roofs with limited available resources and then think of having permanent structure of wall and floor. This can be clearly inferred from the Census data (Table 5). Moreover, there could be few factors have contributed the shift to use of GI sheets in the households, more particularly in the rural households. This is cost effective in the long run, available with variations in quality and affordable on price front. These sheets are also received under certain state supported programme.

Overall it can be commented that people prioritise the shed over their heads with limited resources at their disposal. Census data overall reflects a crisis to afford a safe house by majority of people in the state or in the country. This can be inferred from the Table 5. On the other hand the household who can afford a RCC roof, construction of a permanent wall is largely feasible.

Table 5: Tinned and concrete roofed households with safe walls (GI sheets, concrete, burnt bricks)

		Tinned roofed HH with safe wall	Concrete roofed HH with safe wall
Assam	Total	29.2	91.7
	Rural	25.4	92.2
	Urban	48.7	91.6

C. Living space and congestions

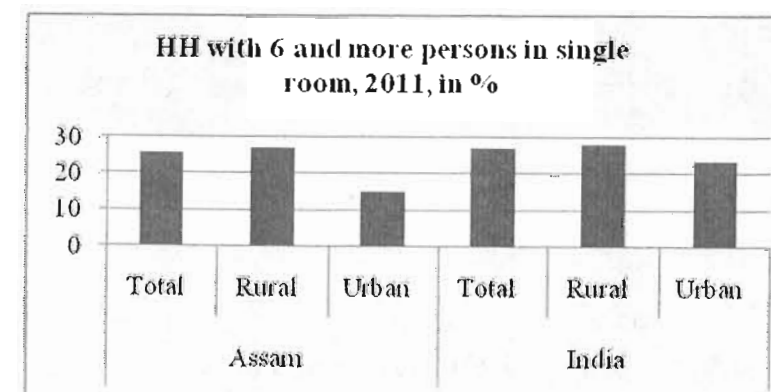
Congestion in living spaces in Assam households is low compared to country averages and over the years it shows improvement. In 2001 about 38 percent households with 3-5 persons in their families used to live in single room. This proportion has declined to about 34 percent in 2011. On the other hand about 28 percent households with 6 and more persons in their families used to live in single room to the 2001 census and this proportion too improved to 25 percent in 2011. The census data however show rise in proportion of households with no exclusive room during 2001-2011. It means that these households live and cook in the same rooms.

Congestions inferred from one roomed households reveal that rural households live in a more constrained space (Table 6). Considering the relative availability of open spaces in rural areas congestion of living spaces indicate poverty and subsequent inability to construct additional spaces.

Table 6: Congestions in the households, large families in single roomed homes

HH size 3-5 persons		2011		2001	
		No exclusive room	One room	No exclusive room	One room
Assam	Total	3.1	33.7	1.5	37.9
	Rural	3.4	35.9	1.7	40.0
	Urban	1.9	23.0	0.7	27.8
India	Total	3.9	39.2	3.2	42.4
	Rural	4.4	42.5	3.6	44.9
	Urban	3.0	33.0	2.2	36.7

HH size 6 and more - persons		2011		2001	
		No exclusive room	One room	No exclusive room	One room
Assam	Total	3.0	25.4	1.4	27.6
	Rural	3.1	26.8	1.5	28.6
	Urban	2.0	14.8	0.9	19.3
India	Total	3.1	26.8	2.1	28.2
	Rural	3.3	28.0	2.3	28.8
	Urban	3.6	23.4	1.6	26.4



Overcrowding is considered as a prime indicator of bad housing results in poor conditions of living. Living in overcrowded accommodation or housing with shared facilities puts children at greater risk of infectious disease (ODPM, *The impact of overcrowding on health and education: a review of the evidence and literature*, 2004 quoted in Harker, 2006). Some of the outcomes of overcrowding could be respiratory problems (exposed to tobacco smokes, childhood tuberculosis). Overcrowding and bad housing also could result in low educational achievement. This in turn has long-term implications for economic well-being in adulthood because of the increased the likelihood of unemployment or working in insecure or low-paid jobs (extracted from Harker, 2006).

D. Basic facilities in the households

Use of clean and convenient energy

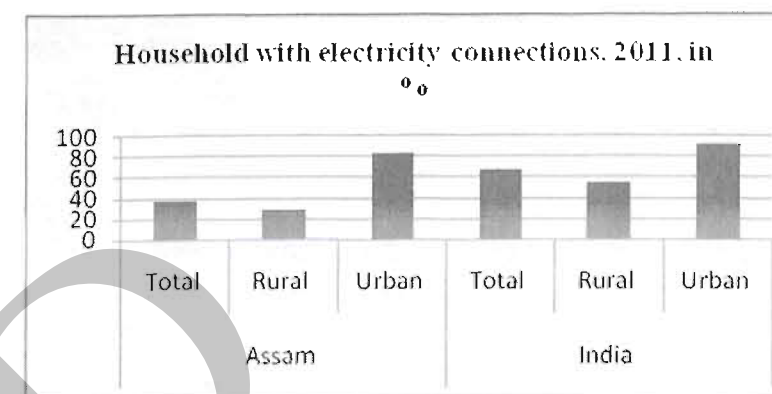
Lighting of the households-electricity connections still not affordable!

Census 2011 data reveals that just 37 percent households in Assam (country average 67 percent) have electricity connections (rural 28.4 percent and urban 84.1 percent). In addition to electricity connections 0.8 percent households in the state have solar energy connections (0.9 percent rural and 0.3 percent urban households have solar energy connections). The figures of 2011 are some improvement over 2001 Census data. In 2001 altogether 24.9 percent households in Assam had electricity connections (rural 16.5 percent and urban 74.3 percent) and just 0.2 percent households had solar energy connections. Use of this unconventional energy has increased significantly in recent times more particularly in rural areas.

Table 7: use of electricity and solar energy for lighting

		2011		2001	
		Electricity	Solar energy	Electricity	Solar energy
Assam	Total	37.0	0.8	24.9	0.2
	Rural	28.4	0.9	16.5	
	Urban	84.1	0.3	74.3	
India	Total	67.2	0.4	55.8	0.3
	Rural	55.3	0.5	43.5	0.3
	Urban	92.7	0.2	87.6	0.2

* Source: Census of India, 2001 and 2011-Housing tables



Temporal data on electricity connections though show some improvement in the state, we see certain issues which may require discussion. In Assam altogether 78.5 percent villages have electricity connections (Government of Assam, 2011). Very low proportions (28.4 percent) of rural households subscribing to electricity connections raise the affordability issue. Moreover even at this level of domestic connection (apart from the 1.66 lakh commercial connections) there is 16 percent shortage in supply in normal hours and 22 percent in peak hours in the state (Government of Assam, 2011). Assam at present is experiencing an average peak power demand of 1100 MW. This is more than two times what it was five years back. Since no power generation project is commissioned in recent times the gap of demand and supply is widening. Total availability of power in the state is around 800 MW of which 540 MW is allocation of central sector power generating station (CSGS) and 260 MW is from own generation of the state†

We observe high variations in electricity connections in the districts of the state (Max-Tinsukia 60.3 % and Kamrup Metro 86.4 %; Min-Dhubri 17.4%; Standard Deviation 14.3). Along with Dhubri district Kokrajhar, Barpeta, Baska, Chirang, Darang, Marigaon, Lakhimpur and Dhemaji districts have shown electricity connections in less than 30 percent of the total households.

Irregular and intermittent supply of electricity and low voltages are often reported in rural areas of the state. The rising preference for the use of solar energy may be because of the intermittent supply of electricity as well as convenience in use. The installations of the solar panel are however not cost effective and it brings in the issue of subsidy‡.

† For detail note on power supply situation see the website of APDCL- www.apdcl.gov.in

‡ The Ministry of New and Renewable Energy, GoI, has come out with differentiated level of subsidies for solar energy system and devices. There are capital subsidies ranging from of 30 % to 60 % in special category states. The Assam Electricity Regulatory Commission in July 2010 had come out with a notification on procurement of electricity from schemes covered under Rooftop PV and Small Solar Power Generation Programme (RPSSGP) under the Jawaharlal Nehru National Solar Mission Regulation 2010. The target is to set up 100 MW by March 2013 (extracted from the website of IREDA). The present status of the programme is not known.

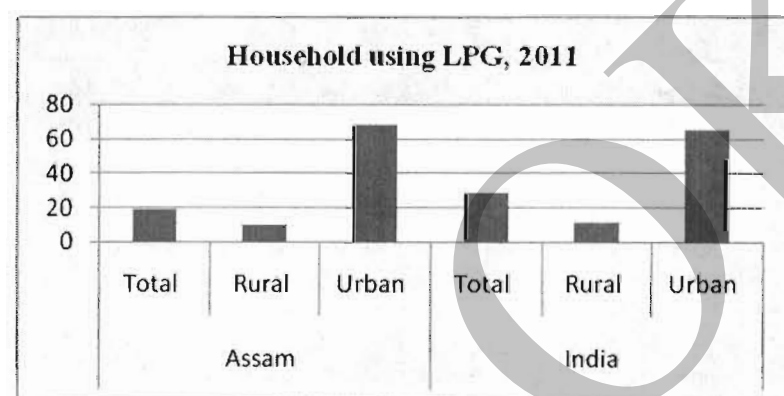
We observe efforts of the state to raise effective coverage of electricity supply. The *Rajiv Gandhi Grameen Vidyut Yojana* now comes out with DPR to cover 13330 already electrified villages, 4439 non-electrified villages and 4086 de-electrified villages in Assam and ensure connections in 991,656 BPL households under the *Yojana*. The total project cost is estimated at Rs. 1720 crores (Report on status of Approval of RGGVY Projects for North-East States- status as on November 30, 2012; www.rggvy.gov.in). Data for the year 2010-11 however reveals that just 147 HH got electricity connections under *Rajiv Gandhi Grameen Vidyutikaran Yojana* in Assam ([www.iay.nic.in/netiay/IAY-state wise progress on convergence-2010-11](http://www.iay.nic.in/netiay/IAY-state_wise_progress_on_convergence-2010-11), accessed on 4.12.2012)

Use of clean fuel

In 2001 just 13.4 percent households (rural 6.5 percent and urban 54 percent) used clean energy (LPG electricity, biogas) for cooking in Assam. This figure had increased to 19.2 percent in 2011 (rural 10 percent and 68.3). The proportion of households using clean energy for cooking is much lower than the country averages.

Table 8: Use of clean fuel (LPG, electricity and bio-gas) for cooking

		2011			2001		
		LPG	Electricity	Bio-gas	LPG	Electricity	Bio-gas
Assam	Total	19.0	0.05	0.12	13.2	0.11	0.05
	Rural	9.9	0.04	0.11	6.4	0.05	0.05
	Urban	68.0	0.09	0.19	53.5	0.42	0.08
India	Total	28.5	0.09	0.4	17.5	0.2	0.4
	Rural	11.4	0.07	0.4	5.7	0.1	0.5
	Urban	65.0	0.1	0.4	48.0	0.3	0.4



Use of clean energy leaving aside the Kamrup metro district is found to be highest in Jorhat district (30.9 %) and lowest in Baska (6%) district. In districts such as Dhubri, Kokrajhar, Chriang, Udalguri, Darrang and Hailakandi less than 10 percent households

have LPG connections. Studies^{§§} link asthma and other smoke related diseases to use on unclean energy. Using the district level data on prevalence of chronic asthma and respiratory infections from the Assam Annual Health Survey 2010-11 and correlating these data with proportion of households without the clean energy used for cooking, we however did not find a positive association^{***}.

Use of firewood and other unclean energy also bring in the issues of time-use pattern of women more particularly in rural households of the state. The issue of LPG subsidy at presents creating debate even though just about 20 percent households in the state have the LPG connections. We could visualise a deepening crisis once more and more households in the state opt and avail LPG connections.

Access to safe drinking water

According to the NRDWP, 2013 guidelines a source of water can be considered safe if a source by nature of construction or active intervention is protected from outside contamination, particularly from faecal matter. Considering this water sourced from taps, protected wells, tube/bore wells, hand pumps are in general considered as safe sources for drinking purpose (we take into these sources to have the proportion of households with safe sources in table 9). Water sourced from spring, river, canal, tank and lake are not considered as safe sources unless they are protected. Moreover, water supplied by cart with small containers, tanker trucks, surface water are cannot be considered as safe for direct drinking (WHO/UNICEF-JMP for water supply and sanitation; www.wssinfo.org/definitions-methods/watsan-categories, accessed on 31st May, 2013). Census of 2011 also comes out with more stringent criteria to define and capture safe sources of drinking water. Segregation and classification of sources of taps and wells as treated and untreated tap waters and covered and un-covered wells capture a realistic scenario of on drinking water safety (we have taken this into consideration in the treated safe category in Table 9)^{†††}.

In context of availability of safe drinking water temporal data shows a reverse scenario (Table 9). There is decline of proportion of households in Assam with access to safe drinking water from 85 percent in 2001 to 70 percent in 2011. The trend is the same for the country as a whole. The treated sources reveal that very few proportion of households (11 percent in total and 32 percent in urban) has access to safe sources of

^{§§} There is a extensive annotate bibliography on ARI and indoor air pollution, with emphasis on children under 5 in developing countries prepared by USAID and Environmental Health Project (1998) www.ehproject.org.

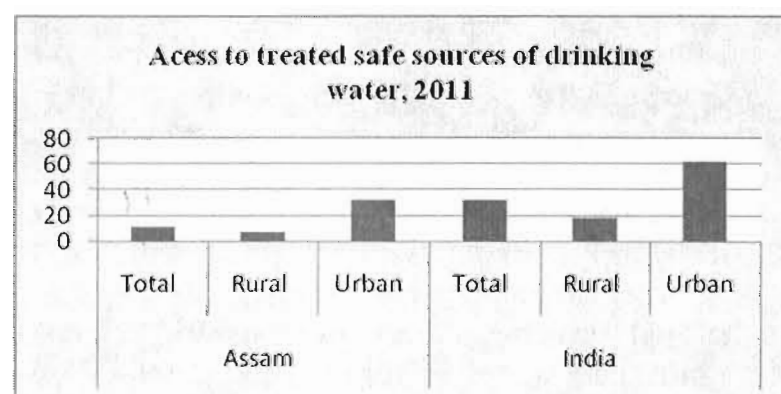
^{***} Assam Annual Health Survey, 2010-11 shows high concentration of ARI in districts of Tinsukia, Dibrugarh, Golaghat, Jorhat, Sibsagar, Nagaon, Cachar and Karbi Anglong. These districts show better status in housing indicators in the state. One commonality is that these districts have concentrations of tea plantations. Rising use of fertilisers and pesticides may be a probable determinant of ARI and not the kitchen with smokes.

^{†††} From the Census of India data it is however not possible to capture localised contamination of drinking water, fluoride and arsenic threats even from the safe sources of drinking water.

drinking water compared to country average (32 percent in total and 62 percent in urban) One reason for this is because of the stringent classification of water source to define as safe sources. The other reasons may be with rising pressure of population, industrial and commercial uses of water have invaded the space of water suitable for drinking.

Table 9: Households with safe sources of drinking water

		2011		2001
		Safe sources#	Treated -safe*	Safe sources
Assam	Total	70.2	10.8	85.4
	Rural	68.4	6.9	83.8
	Urban	80.2	32.2	94.9
India	Total	75.5	32.0	96.1
	Rural	71.3	17.9	95.5
	Urban	84.4	62.0	97.7



District wise data reveal that Dhubri, Goalpara, Barpeta, Darrang and Marigaon (have concentration of minority population); Kokrajhar, Baska and Chirang (BTAD districts under 6th Schedule of the Constitution); and Nalbari, Kamrup Rural and Dhemaji district households show worst coverage in access to safe sources of drinking water (coverage less than 5 percent considering households of all areas and less than 10 percent considering households of urban areas, Appendix table 8). The stringent definition to consider water as safe quality put enormous challenges for the State. This is also desired as safe sources of drinking water show negative correlation with acute illness of diarrhea and dysentery among rural population and rural female population. We have run correlation of proportion of rural households having to safe sources of drinking water in 2011 (treated tap water, covered well, tube well and hand pump) with the cases of diarrhea and dysentery among per lakh rural population and rural female population in the districts of Assam as population prevalence the Assam reported in annual health data of 2010-11. This consolidates a well established fact on the significance to ensure safe drinking water to the households.

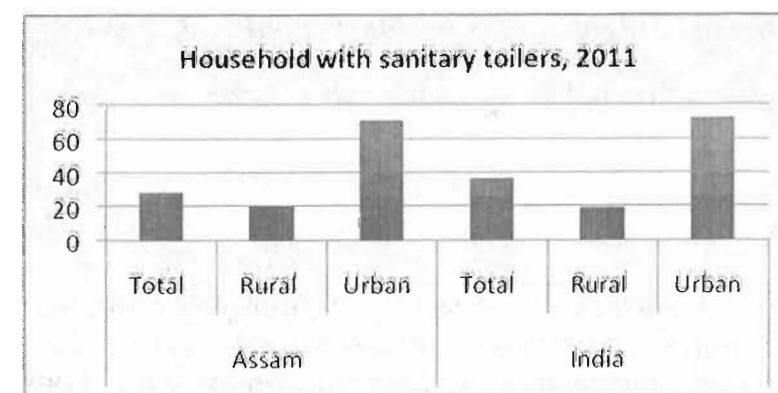
Use of sanitary toilets

In Assam just 29 percent households (21 percent in rural areas and 71 percent in urban areas) have sanitary toilets within their premises. This figure is though an improvement over 2001 Census, the tasks of sanitation drive is still unaccomplished.

Table 10: Households with sanitary toilets

		2011			2001		
		Sanitary - water closet toilets	Unsanitary toilets	No toilets	Sanitary - water closet toilets	Unsanitary toilets	No toilets
Assam	Total	28.5	36.4	35.1	15.9	48.7	35.4
	Rural	20.6	39.0	40.4	8.6	51.0	40.4
	Urban	71.0	23.7	6.3	58.9	35.7	5.4
India	Total	36.4	10.5	53.1	18.0	18.4	63.6
	Rural	19.4	11.3	69.3	7.1	14.8	78.1
	Urban	72.6	8.8	18.6	46.1	27.6	26.3

Source: www.tsc.nic.in



A baseline survey (2012) conducted by Ministry of Drinking Water and Sanitation reveal coverage on water and sanitation in institutions attended by the children. The data indicate poor positioning of state of Assam compared to the national average (table 11).

Table 11: Water and sanitation coverage in institutions attended by children

	India	Assam
Households having toilets	45.7	40.5
Households having functional toilets among the HH having toilets	86.2	76.2
Govt. AWC having toilets	77.6	15.7
Govt. AWC having adequate water supply	66.9	32.8
Govt. school without toilets	4.9	35.3

Govt. school without water facility	12.8	28.0
Private. school without toilets	10.2	38.4
Private school without water facility	10.9	26.6

* Note: Figures are in percentage; figures for Assam are based on partial estimation till done till May 30, 2013

The Ministry of drinking water and sanitation has indicated the following progress under the Nirmal Bharat Abhiyan in the state of Assam. It is also reported utilization of 88 percent fund of the total release of Rs. 59,689 Lakh. Considering Census of India 2011 data that about 4.3 million rural households in Assam do not have access to sanitary toilets the NBA has miles to go to ensure total sanitation in rural areas of the state.

Table 12: Construction of individual household toilets in Assam

	Target	Achieved	Performance
Individual household toilets- BPL	2,220,017	1,619,879	72.97
Individual household toilets- APL	1,161,020	428,443	36.90

Source: www.tsc.nic.in

E. Policy, finance and interventions on housing in India

Government programmes and policy on housing

The National Rural Housing and Habitat Policy, 1998 envisages that rural housing should contribute to substantial improvements in the quality of life of the rural households and reflect their aspirations, total development, facilitate provision of all basic amenities, which have a direct impact on the family's health vigour and efficiency; and women and children in particular should be able to maintain their health and pursue social and economic activities. Construction of rural housing was though envisaged in the 1980s with the National Rural Employment Programme, and Indira Awas Yojana as a sub scheme of Rural Landless Employment Guarantee Programme in 1985-86 for marginal land weaker sections of the society, the task is still not accomplished as revealed by our housing indicators.

The financial assistance provided for new construction in the form of full grant is Rs.45,000/- per unit for plain areas & Rs.48,500/- for hilly/difficult areas. Further, an IAY beneficiary can avail top-up loan upto Rs 20,000/- under the Differential Rate of Interest Scheme from any Nationalised Bank at an interest rate of 4percent per annum.

During 2007-08 to 2011-12 the state of Assam had target to complete 877,500 IAY homes of which 670,218 were completed (76.4 %). The period also shows construction of 145,324 sanitary toilets. For the year 2012-13 the state had target to construct 184,408

IAY homes of which 182,021 houses were sanctioned. During 2012-13 altogether 147,000 houses were under construction of which 96,000 were completed (52.7 percent).

State wise financial performance of IAY housing for the year 2010-11 reveals that Assam had able to spend 72.5 percent of the total fund available for that year. The proportion of fund utilised for the country as a whole on IAY housing was 74.4 percent. The proportion of fund utilised for the year 2012-13 was just 55.1 percent (Table 13).

Table 13: Financial performance of Assam in IAY

Central Allocation	State allocation	Central release	State release	Misc. received	Earlier balance	Total fund available	Total utilised
74575.72	8286.18	71031.77	7892.42	14489.68	22678.13	116086.0	84128.03
80494.43	8943.83	57349.0	NA	NA	NA	108358.0	59711.0

*Source-Proceeding of IAY review meeting, June 1&2, 2011 and PRC group meeting 28th May, 2013, extracted from www.iay.nic.in # Figures are in Rs. Lakh,

Table 14: Physical performance of Assam in IAY

Year	Annual target	Sanctioned	HH under construction sanctioned previous year	Completed HH during 2010-11
2010-11	170849	167990	103528	155146 (92.4 %)
2012-13	184408	182021	147000	96000 (52.7 %)

Source: *Source-Proceeding of IAY review meeting, June 1&2, 2011 and PRC group meeting 28th May, 2013, extracted from www.iay.nic.in # Figures are in Rs. Lakh,

On IAY programme few issues emerges. Data shows that the state machineries after setting the target to construct 40 percent rural homes of the total estimated shortage of 2.24 million houses in rural areas, in 4 years (2007-8 to 2011-12) have able to work three fourth of the potential capacity.

It is estimated that during 2010-11 an amount of Rs. 54,000 (Rs. 62,119/ in 2012-13) was spent to construct one unit of IAY house, though the sanction was Rs. 45,000 per unit. The issue is that money released under IAY just suffices to have the structure of the house, a permanent roof of GI sheets and walls of burnt brick and not necessarily covers other basic amenities. It may be that houses will remain with mud floor, without a ceiling to absorb heats, with no electricity connections and safe water supply.

Towards assurance of basic amenities we see convergence of certain programmes. During 2010-11 altogether 24,074 rural households got sanitary toilets, 27030 rural

households got smokeless chulas and 147 households got electricity connections under Rajiv Gandhi Grameen Vidyutikaran Yojana in Assam (Proceeding of IAY review meeting, June 1&2, 2011, extracted from www.iay.nic.in).

Key findings

The structural indicators on housing and basic facilities available reflect significant spatial variation in coverage. Some clear clusters of poor performing districts have emerged in the state. These are presented in the following tables.

Features	Worst performing districts	Characteristics of the districts
Dilapidated homes	Barpeta, Darrang, Dhubri, Hailakandi, Marigaon, Karimganj, Nagaon (more than 12.5 % homes are dilapidated; state average 10.9 %)	Concentration of religious minority population
Mud floored homes	Baksa, Dhubri, Marigaon, Udalguri, Darrang, Barpeta, Hailakandi, Chirang, Karbi Anglong, Kokrajhar, Goalpara (more than 87 % homes are mud floored; state average 77 %)	Concentration of religious minority population and sixth scheduled area
One roomed homes with 6 or more people	Karimganj, Hailakandi, Cachar, Dhubri, Darrang, Barpeta (more than 35 % homes are congested; state average 25 %)	Concentration of religious minority population
Electricity connections	Dhubri, Dhemaji, Kokrajhar, Chirang, Baska, Darrang, Barpeta, (less than 27 % homes have connections; state average 37 %)	Concentration of religious minority population, sixth scheduled and flood prone areas
LPG connections	Baska, Dhubri, Hailakandi, Udalguri, Kokrajhar, Chirang, Darrang (less than 10 % homes have connection; state average 19 %)	Concentration of religious minority population and sixth scheduled area
Safe drinking water	Barpeta, Dhubri, Dhemaji, Goalpara, Darrang, Baska, Nalbari, Marigaon, Kokrajhar, (less than 4 % homes have access; state average 11 %)	Concentration of religious minority population and sixth scheduled area
Sanitary toilets	Dhubri, Kokrajhar, Chirang, Baska, Dhemaji, Darrang, Marigaon, Udalguri (less than 20 % homes have sanitary toilets; state average 29 %)	Concentration of religious minority population, sixth scheduled and flood prone areas

It has appeared that a large section of people cannot afford to construct a decent home and lacks purchasing power to avail basic facilities for good living.

It has appeared that the money released under IAY just suffices to have the structure of the house and cannot cover the needs of basic amenities of water and sanitation. The efforts of the state need convergence of all the piece-meal programmes.

Observations

The state has to traverse many hurdles to ensure decent housing and basic amenities to a large section of people. District wise analysis of housing conditions reveals that certain pockets (the minority Muslim concentrated districts in lower and southern Assam- marked red in the figures; and BTAD districts- marked green in the figures) need serious attentions.

The State is well aware of the situation and this can be inferred from the ongoing programme and policies of the State. The interventions however look insufficient. Moreover it also shows inability to spend the entire available resources earmarked and released. It can be argued that interventions at least in case of basic housing, drinking water and sanitary toilets cannot be postponed or lingered. Coming to the context of clean energy- for cooking and lighting of the homes the state in near future could face a daunting task in a resource constraint situation-financial as well as scarce commodity front. The issue is that majority of the households in the state are still not capable to afford these services at prevailing market price and lack of effective demand now may have put the state in an advantageous situation. Options are available only in innovations in alternative and re-newable energy, but these are yet to be cost-effective at the present level of technology.

Overall it has emerged that impact of poor housing conditions and lack of basic amenities would continue to haunt the children. Research indicates that bad housing increase the risk of severe ill health by 25 percent during childhood and early childhood. Moreover, there is a greater chance of suffering mental health problems and problems with behaviour lower educational attainment, greater likelihood of unemployment, and poverty (Harker, 2006). Census of India data in our context generates enough issues which can be addressed through primary studies.

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Appendix Table 1: Percentage of Dilapidated households in the districts of Assam

Dilapidated households	2011			2001		
	Total	Rural	Urban	Total	Rural	Urban
Assam	10.9	11.8	5.7	10.2	10.9	6.5
Kokrajhar	12.4	13.0	4.7	17.8	18.8	5.4
Dhubri	17.0	17.5	12.2	12.1	12.3	10.3
Goalpara	11.9	12.6	8.0	12.4	12.8	8.7
Bongaigaon	11.1	12.5	4.3	13.5	14.8	5.6
Barpeta	17.7	18.8	7.4	13.2	13.3	11.9
Nalbari	9.4	9.5	8.5	10.6	10.6	0
Kamrup	11.9	12.3	8.6	9.4	11.4	6.5
Kamrup-M	4.8	10.1	3.9	6.4		
Baska	11.2	11.2	7.5			
Chirang	11.2	10.9	14.8			
Udalguri	10.5	10.7	7.2			
Marigaon	14.3	14.8	9.2	12.5	12.5	12.5
Nagaon	12.7	13.8	5.9	12.7	12.7	12.7
Darrang	17.2	17.8	8.6	11.8	11.8	11.8
Sonitpur	9.6	10.2	4.5	12.7	12.7	12.7
Lakimpur	9.2	9.7	5.5	9.6	9.8	8.0
Dhemaji	9.8	10.0	7.2	6.5	6.5	6.5
Golaghat	7.5	7.9	4.2	8.1	8.1	8.1
Jorhat	7.2	8.1	4.0	7.3	7.3	7.3
Sibasagar	5.9	6.1	3.9	6.1	6.1	6.1
Dibrugarh	5.4	5.7	4.1	5.5	5.5	5.5
Tinsukia	5.0	5.0	5.0	6.2	6.2	6.2
Karbi Anglong	4.2	4.3	3.6	7.4	7.4	7.4
Dima Hasao	4.1	4.5	3.3	2.5	2.3	3.1
Cachar	11.1	12.2	6.1	9.5	9.5	9.5
Karimgang	14.3	14.9	8.7	11.2	11.2	11.2
Hailakandi	16.1	16.8	7.6	12.9	12.9	12.9

Appendix Table 2: Percentage of households having permanent materials on roof of their homes

Permanent materials on roof	2011			2001		
	Total	Rural	Urban	Total	Rural	Urban
Assam	77.1	74.4	92.0	47.7	41.4	84.8
Kokrajhar	72.5	71.3	90.2	32.8	29.1	76.1
Dhubri	81.1	80.4	87.4	41.9	38.2	68.6
Goalpara	87.6	86.5	94.1	45.0	41.7	77.7
Bongaigaon	89.3	88.3	94.0	51.2	44.9	89.6
Barpeta	82.5	81.0	96.9	44.9	40.9	89.8
Nalbari	86.5	85.2	96.3	45.1	43.6	96.4
Kamrup	84.9	83.8	94.8	66.0	46.9	92.7
Kamrup-M	93.5	88.9	95.2	93.1		
Baska	78.2	78.0	94.4			
Chirang	77.4	76.4	88.6			
Udalguri	79.3	78.5	95.1			
Marigaon	74.1	72.2	93.8	33.8	31.1	74.6
Nagaon	70.5	66.7	93.1	41.6	35.4	82.7
Darrang	76.6	75.2	95.5	36.1	33.3	86.3
Sonitpur	76.6	74.5	94.5	46.3	41.6	88.4
Lakimpur	75.1	72.8	94.8	45.3	41.4	85.6
Dhemaji	56.0	54.0	78.9	21.8	18.2	61.2
Golaghat	83.8	82.5	95.1	55.1	52.2	85.3
Jorhat	86.3	84.2	93.9	68.9	63.8	91.3
Sibasagar	83.7	82.5	94.4	69.0	66.3	92.7
Dibrugarh	77.0	74.4	87.2	60.9	55.0	84.3
Tinsukia	70.8	66.4	86.5	57.7	50.8	83.2
Karbi Anglong	60.2	55.5	90.2	20.6	15.9	50.1
DimaHasao	64.9	53.9	89.1	44.7	28.2	76.6
Cachar	69.9	66.8	83.5	45.7	40.2	78.0
Karimgang	62.0	59.5	84.8	38.6	34.5	86.2
Hailakandi	64.3	62.5	87.0	36.3	32.0	79.6

Appendix Table 3: Percentage of households having safe and permanent (burnt brick & concrete) wall in their homes

Safe & permanent wall	2011			2001		
	Total	Rural	Urban	Total	Rural	Urban
Assam	24.0	18.7	52.6	18.3	13.3	47.6
Kokrajhar	16.4	13.9	53.2	8.1	5.4	40.0
Dhubri	12.2	8.8	41.0	7.1	4.1	28.0
Goalpara	20.5	17.4	38.9	10.6	8.1	35.9
Bongaigaon	21.8	14.3	58.8	15.7	8.8	57.6
Barpeta	15.0	10.7	57.2	11.8	8.5	48.8
Nalbari	28.9	25.2	57.6	15.2	13.9	61.5
Kamrup	26.3	23.7	49.7	31.1	14.4	54.6
Kamrup-M	61.3	31.8	66.3	55.4		
Baska	8.5	8.2	25.5			
Chirang	12.2	9.9	40.1			
Udalguri	23.1	22.1	43.5			
Marigaon	17.8	15.0	46.9	10.0	8.0	41.5
Nagaon	22.2	19.5	38.6	14.7	11.6	35.2
Darrang	19.1	16.9	49.8	12.8	11.0	43.8
Sonitpur	28.7	25.0	60.1	23.1	19.4	57.2
Lakimpur	20.8	17.5	48.6	15.1	12.7	40.3
Dhemaji	9.8	7.5	36.1	5.5	3.7	24.9
Golaghat	17.9	14.7	46.7	15.4	13.3	36.5
Jorhat	30.6	24.0	53.9	27.9	22.1	53.3
Sibasagar	29.8	26.9	54.4	26.1	23.5	48.5
Dibrugarh	34.0	28.3	56.6	33.0	27.1	56.4
Tinsukia	33.2	29.5	46.7	32.5	28.5	47.3
Karbi Anglong	9.4	6.6	26.7	7.3	4.7	23.7
DimaHasao	15.5	6.9	34.4	13.7	6.1	29.0
Cachar	25.7	21.1	45.5	17.1	11.7	48.6
Karimgang	31.0	28.2	57.1	19.0	15.4	61.8
Hailakandi	24.0	21.3	58.0	15.1	11.2	53.9

Appendix Table 4: Percentage of households having mud floor in their homes

Households with Mud floor	2011			2001		
	Total	Rural	Urban	Total	Rural	Urban
Assam	78.6	86.2	37.3	83.5	90.1	44.6
Kokrajhar	84.8	88.6	29.7	89.6	93.8	40.1
Dhubri	90.1	94.8	50.4	92.3	96.9	59.2
Goalpara	84.4	88.7	59.4	88.8	92.0	57.1
Bongaigaon	78.7	89.3	27.0	84.7	93.3	33.3
Barpeta	88.1	92.6	45.0	92.2	95.6	54.7
Nalbari	80.5	84.2	51.7	91.0	92.5	37.2
Kamrup	79.7	82.7	53.6	66.7	88.1	36.6
Kamrup-M	29.2	73.6	21.6	35.1		
Baska	93.4	93.7	71.7			
Chirang	86.9	89.8	52.4			
Udalguri	89.0	91.1	48.4			
Marigaon	89.3	93.1	50.9	92.9	95.2	56.9
Nagaon	83.5	89.4	48.0	86.9	91.9	54.3
Darrang	88.3	91.4	45.8	91.7	94.0	50.8
Sonitpur	77.8	83.3	30.4	83.5	88.6	37.8
Lakimpur	66.5	69.1	44.3	73.4	75.4	53.0
Dhemaji	63.9	64.9	52.4	70.2	70.4	67.4
Golaghat	81.3	85.6	42.5	86.7	89.5	58.0
Jorhat	66.1	74.0	38.3	74.8	81.5	45.5
Sibasagar	73.5	78.1	34.9	80.8	85.2	43.7
Dibrugarh	71.4	82.3	28.1	77.0	87.2	36.8
Tinsukia	73.2	82.7	39.3	78.8	87.8	45.5
Karbi Anglong	85.7	90.0	58.5	87.2	90.3	67.0
DimaHasao	63.6	77.1	33.9	68.0	78.4	47.2
Cachar	78.8	87.1	42.7	84.5	91.4	44.0
Karimgang	83.2	88.4	33.7	87.7	92.4	33.4
Hailakandi	87.6	91.6	37.8	88.9	93.2	46.1

Appendix Table 5: Percentage of households with size of 6 and more persons in one roomed home

6 + Households size in one roomed home	2011			2001		
	Total	Rural	Urban	Total	Rural	Urban
Assam	25.4	26.8	14.8	27.6	28.6	19.3
Kokrajhar	30.6	31.6	11.8	41.7	43.0	20.3
Dhubri	45.1	47.1	25.6	42.9	44.5	29.3
Goalpara	30.2	31.1	23.9	33.5	34.1	24.8
Bongaigaon	29.1	30.5	16.9	31.1	32.2	20.7
Barpeta	37.1	38.7	16.3	34.6	35.9	17.7
Nalbari	13.6	14.2	7.1	19.4	19.5	13.7
Kamrup	15.4	16.2	6.1	17.8	18.2	16.5
Kamrup-M	11.0	14.4	10.1	17.2	19.4	19.5
Baska	17.2	17.2	13.8			
Chirang	28.4	28.9	20.4			
Udalguri	23.3	23.4	19.5			
Marigaon	29.8	30.5	17.0	25.2	25.5	16.0
Nagaon	24.7	25.6	16.8	23.1	24.0	15.4
Darrang	40.4	41.4	19.2	29.5	29.9	18.7
Sonitpur	16.4	16.8	10.6	17.7	17.9	14.3
Lakimpur	15.7	15.8	12.9	17.2	17.1	20.3
Dhemaji	21.8	22.7	7.3	21.6	22.3	10.7
Golaghat	5.3	5.2	6.7	6.0	5.9	7.3
Jorhat	6.8	6.8	6.9	8.2	7.8	11.2
Sibasagar	3.7	3.4	7.9	3.6	3.1	9.6
Dibrugarh	4.4	3.4	10.2	4.5	3.6	9.7
Tinsukia	5.6	4.7	10.0	5.6	4.2	12.1
Karbi Anglong	10.2	10.5	6.8	14.2	14.4	12.4
DimaHasao	24.5	29.5	8.9	28.3	34.4	12.6
Cachar	56.6	61.5	31.8	67.7	71.1	43.6
Karimgang	61.2	63.7	29.5	73.7	75.7	42.4
Hailakandi	57.4	59.6	25.5	71.1	71.8	62.2

Appendix Table 6: Percentage of households using electricity for lighting in districts of Assam

Use of electricity	2011			2001		
	Total	Rural	Urban	Total	Rural	Urban
Assam	37.0	28.4	84.1	24.9	16.5	74.3
Kokrajhar	23.0	18.6	85.7	13.1	7.9	74.7
Dhubri	17.4	11.5	66.9	11.5	5.4	54.9
Goalpara	39.8	35.6	64.7	15.9	11.2	62.7
Bongaigaon	33.3	23.5	80.7	18.3	9.2	72.9
Barpeta	25.1	19.4	79.7	14.7	10.4	63.2
Nalbari	44.0	39.5	78.7	18.8	17.1	79.2
Kamrup	40.0	35.6	79.5	47.1	24.2	79.2
Kamrup-M	86.4	51.7	92.3	80.1		
Baska	23.3	22.7	66.2			
Chirang	23.1	19.5	66.3			
Udalguri	31.8	29.1	83.0			
Marigaon	28.2	23.6	75.5	15.3	11.7	71.2
Nagaon	34.9	27.6	78.4	24.4	17.9	67.0
Darrang	24.2	20.1	80.8	14.7	11.7	68.2
Sonitpur	34.5	28.3	87.4	24.6	18.3	81.3
Lakimpur	29.7	23.7	79.8	19.0	14.3	67.2
Dhemaji	21.8	17.1	75.2	10.0	6.1	52.1
Golaghat	36.6	30.8	89.2	25.0	20.3	74.5
Jorhat	52.4	42.6	86.8	40.3	31.3	79.3
Sibasagar	50.0	45.2	90.2	38.4	33.0	84.3
Dibrugarh	50.1	39.8	91.2	36.1	24.9	80.9
Tinsukia	60.3	52.5	87.8	34.3	22.9	76.3
Karbi Anglong	30.5	22.6	80.3	18.4	11.7	61.1
DimaHasao	45.2	24.5	90.8	33.3	13.5	72.8
Cachar	38.1	28.5	79.6	25.7	17.0	76.4
Karimgang	28.7	23.4	79.0	21.2	16.1	81.0
Hailakandi	30.7	26.5	84.4	18.1	12.4	74.6

Appendix Table 7: Percentage of households using clean energy (LPG, Electricity or Bio Gas) for cooking in districts of Assam

Use of clean energy	2011			2001		
	Total	Rural	Urban	Total	Rural	Urban
Assam	19.1	10	68.3	13.3	6.5	53.9
Kokrajhar	8.4	4.6	63.1	4.3	1.3	39.3
Dhubri	7.1	2.5	45.9	4.6	1.0	29.5
Goalpara	11.1	5.8	42.1	6.0	2.7	39.4
Bongaigaon	20	9.5	72.0	12.0	4.4	58.1
Barpeta	15.1	10		8.7	5.4	45.4
Nalbari	24.5	20.3	57.5	9.6	8.2	59.7
Kamrup	23.2	19	60.1	35.4	35.4	35.4
Kamrup-M	77.3	29.1	85.5	67.5		
Baska	6	5.7	32.7			
Chirang	8.5	5.8	40.6			
Udalguri	8.2	5.8	55.5			
Marigaon	11.1	6.7	55.9	6.5	3.9	45.9
Nagaon	16.1	9.1	57.8	11.7	6.7	44.7
Darrang	9.5	5.9	59.2	5.3	3.3	40.0
Sonitpur	18.3	11.9	73.3	11.9	6.9	57.0
Lakimpur	15.9	10.6	60.5	10.6	7.2	44.7
Dhemaji	12.9	9.1	56.1	6.3	3.9	32.5
Golaghat	18.4	12.3	73.1	17.7	8.1	53.1
Jorhat	30.9	19.4	71.8	21.6	10.7	64.7
Sibasagar	25	19.2	74.3	20.5	15.6	62.5
Dibrugarh	28.1	15.9	76.8	23.4	15.1	60.0
Tinsukia	26.4	14	70.2	11.6	7.7	51.5
Karbi Anglong	10.8	4.7	49.6	5.4	1.8	28.4
DimaHasao	22.9	5.3	61.8	12.3	2.2	32.5
Cachar	17.1	7.7	58.2	9.9	3.6	46.6
Karimgang	11.5	5.9	61.5	8.0	3.5	61.0
Hailakandi	7.9	3.7	65.6	6.1	1.8	48.3

Appendix Table 8: Households having safe sources of drinking water (tap water, well, hand pump and tube wells)

Safe sources of drinking water	2011# treated tap water & covered well			2011			2001		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Assam	10.8	6.9	32.2	88.7	87.4	96.0	85.4	83.8	94.9
Kokrajhar	3.6	3.4	7.1	93.0	92.6	99.5	91.5	90.9	98.6
Dhubri	1.9	1.3	7.0	91.8	91.1	97.4	94.4	93.9	97.7
Goalpara	2.4	1.9	5.3	94.0	93.6	96.3	93.4	93.2	95.7
Bongaigaon	6.9	2.1	30.2	95.5	94.8	98.9	92.9	92.0	98.1
Barpeta	1.8	1.1	8.9	93.7	93.2	98.8	93.7	93.2	98.8
Nalbari	3.1	2.0	11.3	97.9	97.9	97.9	93.7	93.5	99.5
Kamrup	4.2	2.8	16.3	96.1	95.8	98.1	94.5	94.1	95.0
Kamrup-M	39.7	14.5	44.0	94.4	85.4	96.0	95.0		
Baska	2.7	2.7	3.0	93.6	93.5	99.3			
Chirang	4.2	4.1	5.6	90.9	90.5	95.5			
Udalguri	9.8	9.8	9.2	89.6	89.2	98.4			
Marigaon	3.5	2.3	15.6	95.7	95.4	98.3	95.1	94.9	99.4
Nagaon	5.9	3.8	18.8	95.1	94.5	98.4	92.7	91.9	98.2
Darrang	2.6	2.2	7.5	94.8	94.5	99.1	90.7	90.3	98.1
Sonitpur	9.1	7.1	25.6	93.6	93.0	98.7	91.0	90.3	97.7
Lakimpur	5.9	4.0	22.2	92.8	92.0	99.5	85.8	84.5	99.4
Dhemaji	2.4	2.0	6.9	89.0	88.1	99.6	81.5	79.9	98.9
Golaghat	13.3	11.6	28.8	93.8	93.2	99.5	86.7	85.8	96.9
Jorhat	26.6	17.1	60.3	81.8	78.7	92.7	71.4	68.6	84.1
Sibasagar	18.1	16.0	35.4	87.6	86.6	96.6	80.1	78.0	97.6
Dibrugarh	9.6	3.9	32.4	97.9	97.5	99.4	98.3	97.9	99.7
Tinsukia	8.4	4.6	22.1	97.6	97.3	98.6	97.6	97.2	99.1
Karbi Anglong	9.2	7.1	22.5	80.4	77.9	96.3	76.5	73.8	93.8
DimaHasao	25.1	15.2	46.8	57.9	52.0	70.7	63.8	58.4	74.5
Cachar	36.4	29.9	64.5	70.2	65.6	90.1	51.8	46.2	84.5
Karimgang	12.2	8.4	47.6	52.9	49.8	82.9	41.3	37.4	87.5
Hailakandi	16.7	12.9	65.0	42.2	38.8	85.9	38.6	34.2	82.3

Appendix Table 9: Percentage of households with sanitary toilets (water closet) within home premises in districts of Assam

Sanitary toilets	2011			2001		
	Total	Rural	Urban	Total	Rural	Urban
Assam	28.5	20.6	71.0	15.9	8.6	58.9
Kokrajhar	16.2	12.7	67.4	8.5	4.5	55.8
Dhubri	16.0	11.8	51.4	7.7	3.4	38.1
Goalpara	20.8	16.4	46.4	9.4	5.9	44.0
Bongaigaon	25.0	15.2	73.4	43.0	13.1	68.0
Barpeta	24.2	20.1	64.1	9.0	5.2	52.2
Nalbari	27.2	24.0	52.1	8.9	7.3	64.3
Kamrup	25.4	22.7	50.4	34.7	10.9	68.1
Kamrup-M	75.9	31.8	83.4	69.7		
Baska	16.9	16.3	60.7			
Chirang	16.8	13.6	54.6			
Udalguri	19.9	17.8	60.5			
Marigaon	19.9	16.0	60.4	7.0	4.0	53.4
Nagaon	26.5	20.2	63.6	13.7	7.8	52.9
Darrang	19.3	16.3	61.7	10.4	7.6	60.7
Sonitpur	30.0	24.5	77.4	20.0	14.2	71.7
Lakimpur	25.4	20.9	63.3	12.8	8.1	60.8
Dhemaji	17.6	14.9	47.8	5.4	3.1	30.5
Golaghat	25.3	20.2	71.3	13.5	9.5	54.8
Jorhat	36.9	25.4	77.7	22.8	12.8	66.3
Sibasagar	33.2	28.5	72.8	20.8	15.2	68.3
Dibrugarh	38.6	26.8	85.6	26.3	15.1	71.2
Tinsukia	40.2	30.2	75.7	29.8	21.6	60.2
Karbi Anglong	23.3	18.2	56.2	6.6	3.2	27.7
DimaHasao	41.6	30.7	65.8	15.1	4.8	35.7
Cachar	32.2	23.9	68.3	10.6	5.3	41.8
Karimgang	28.3	23.2	76.4	11.5	8.1	52.0
Hailakandi	24.4	20.8	70.1	7.5	4.0	42.7

Figure: 1

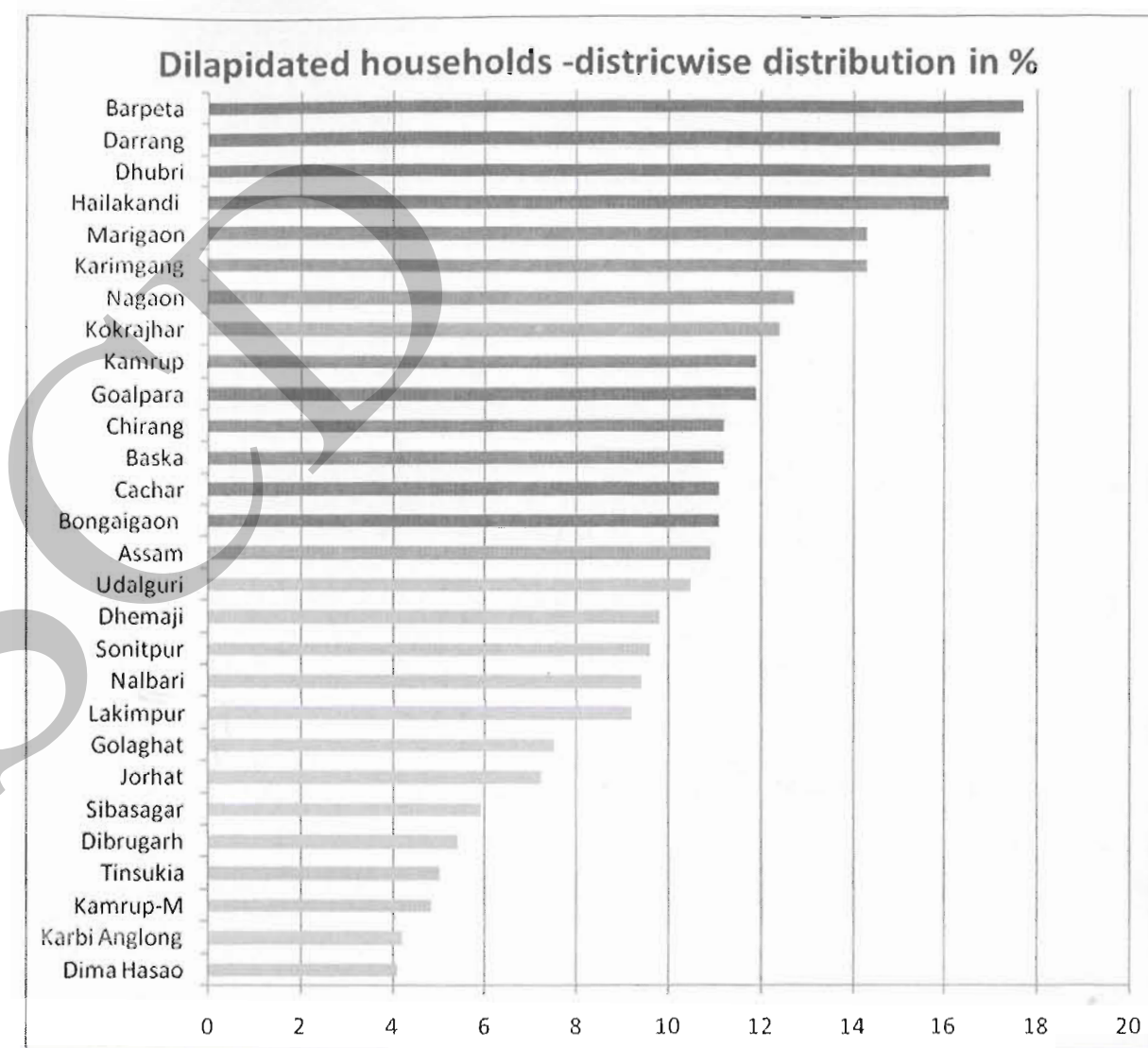


Figure: 2

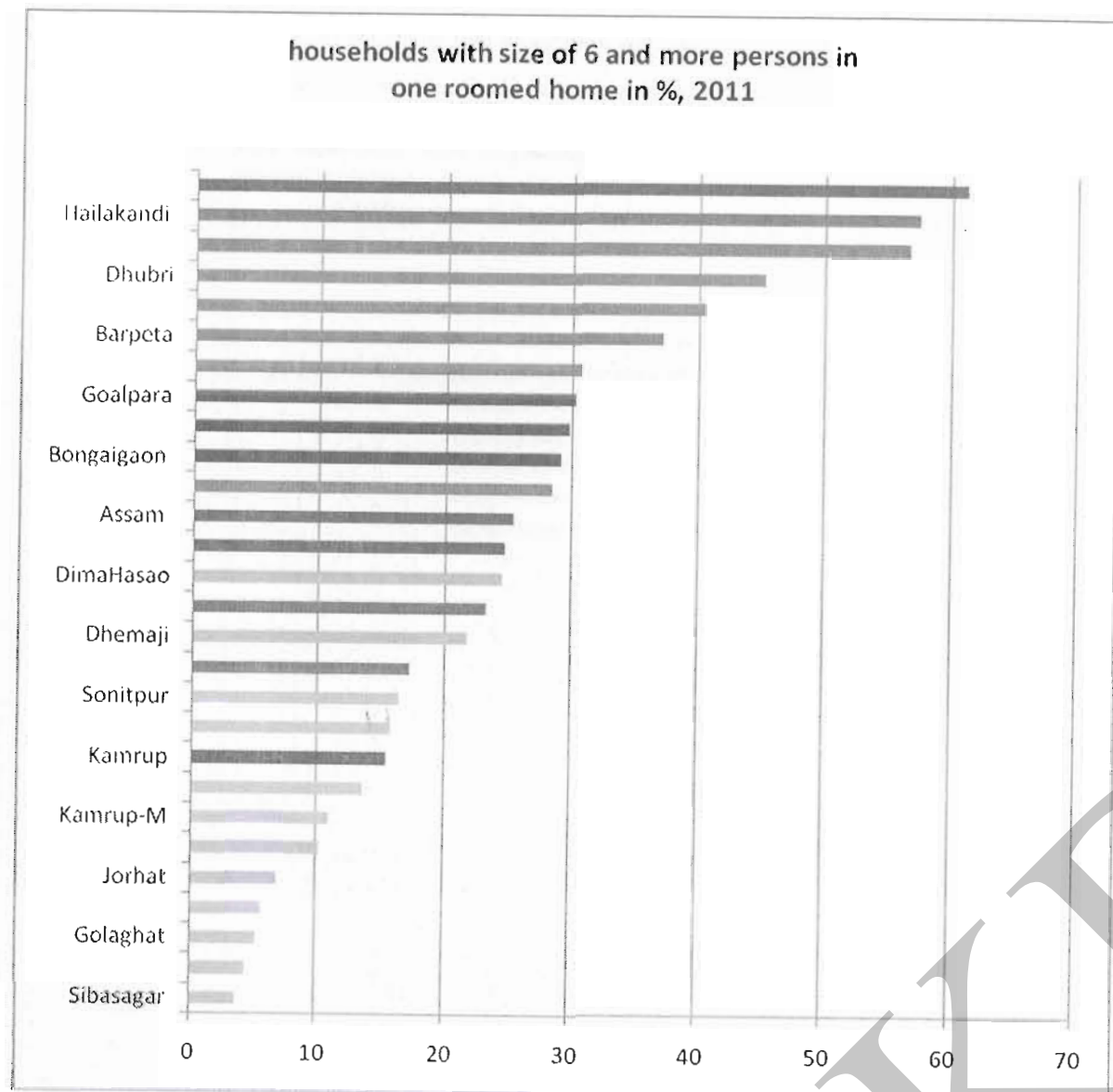


Figure: 3

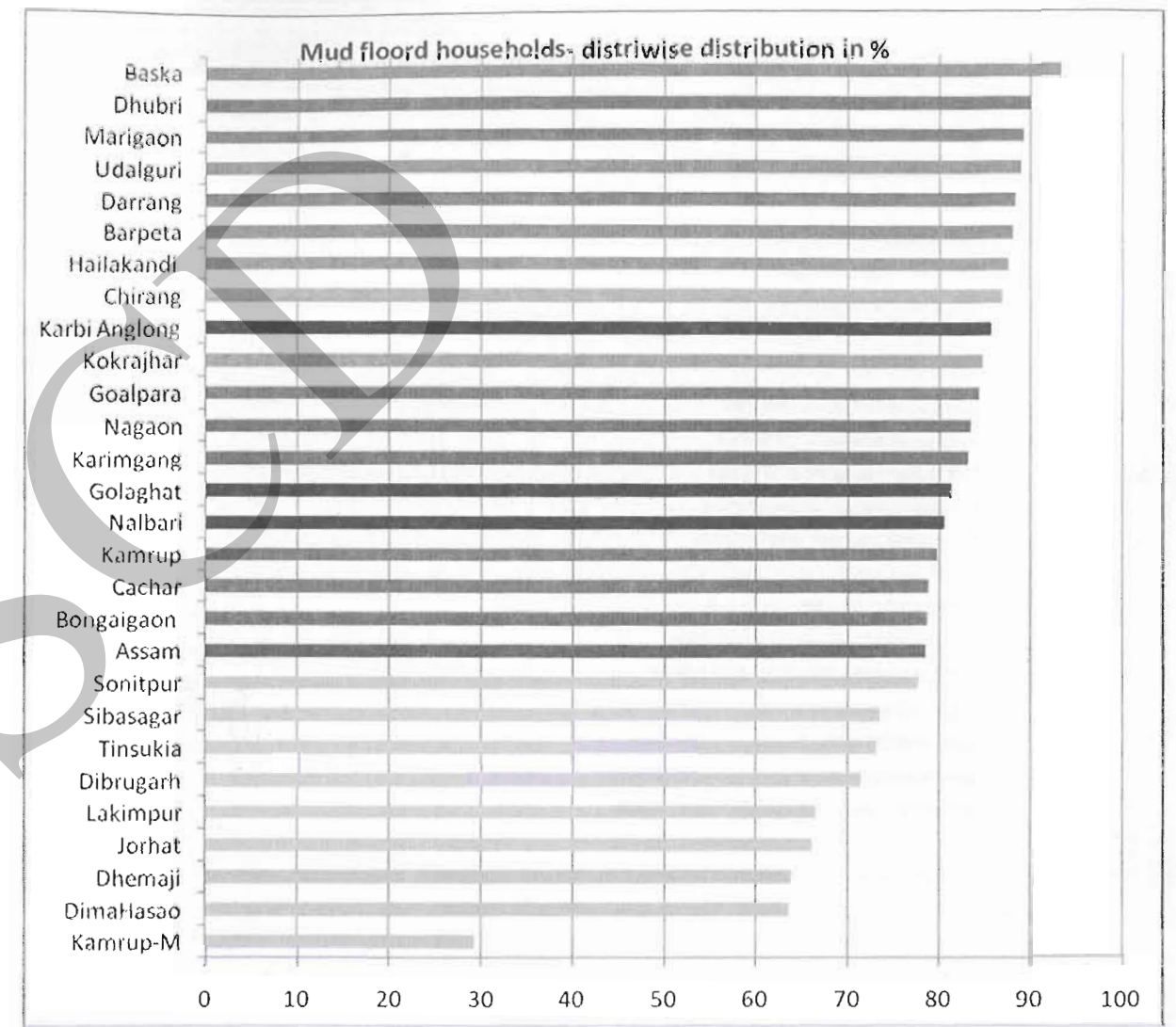


Figure: 4

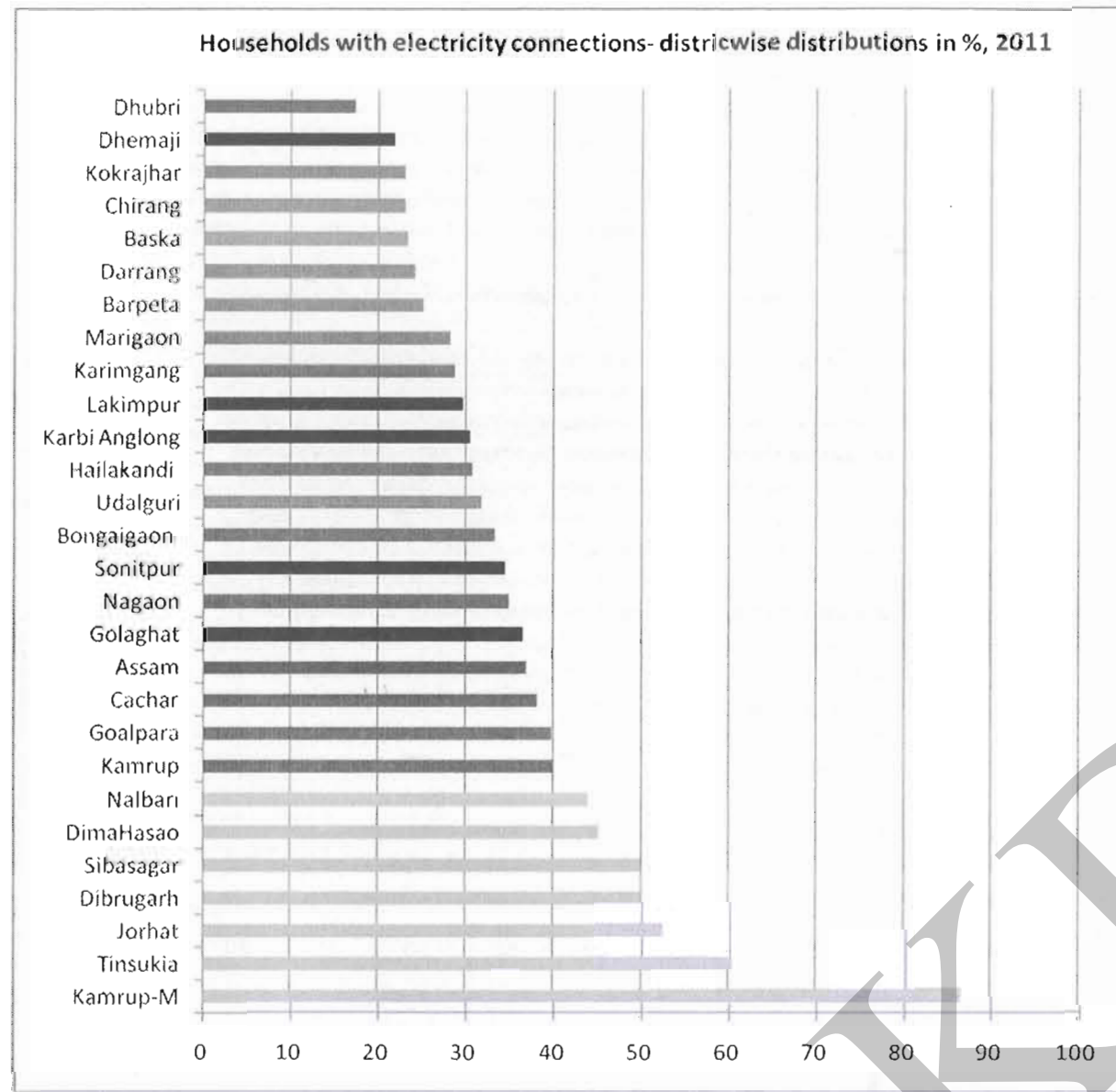


Figure: 5

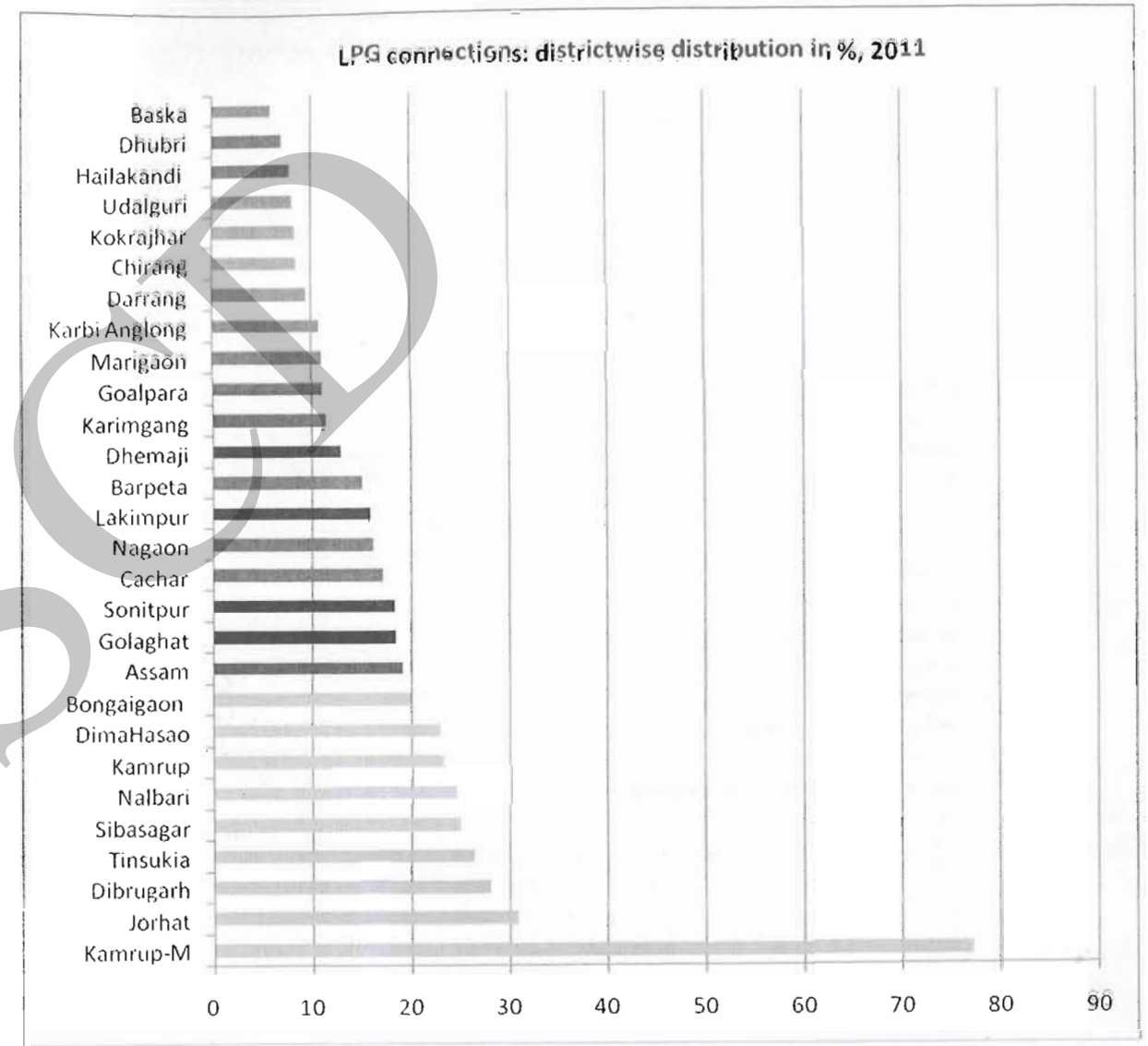


Figure: 6

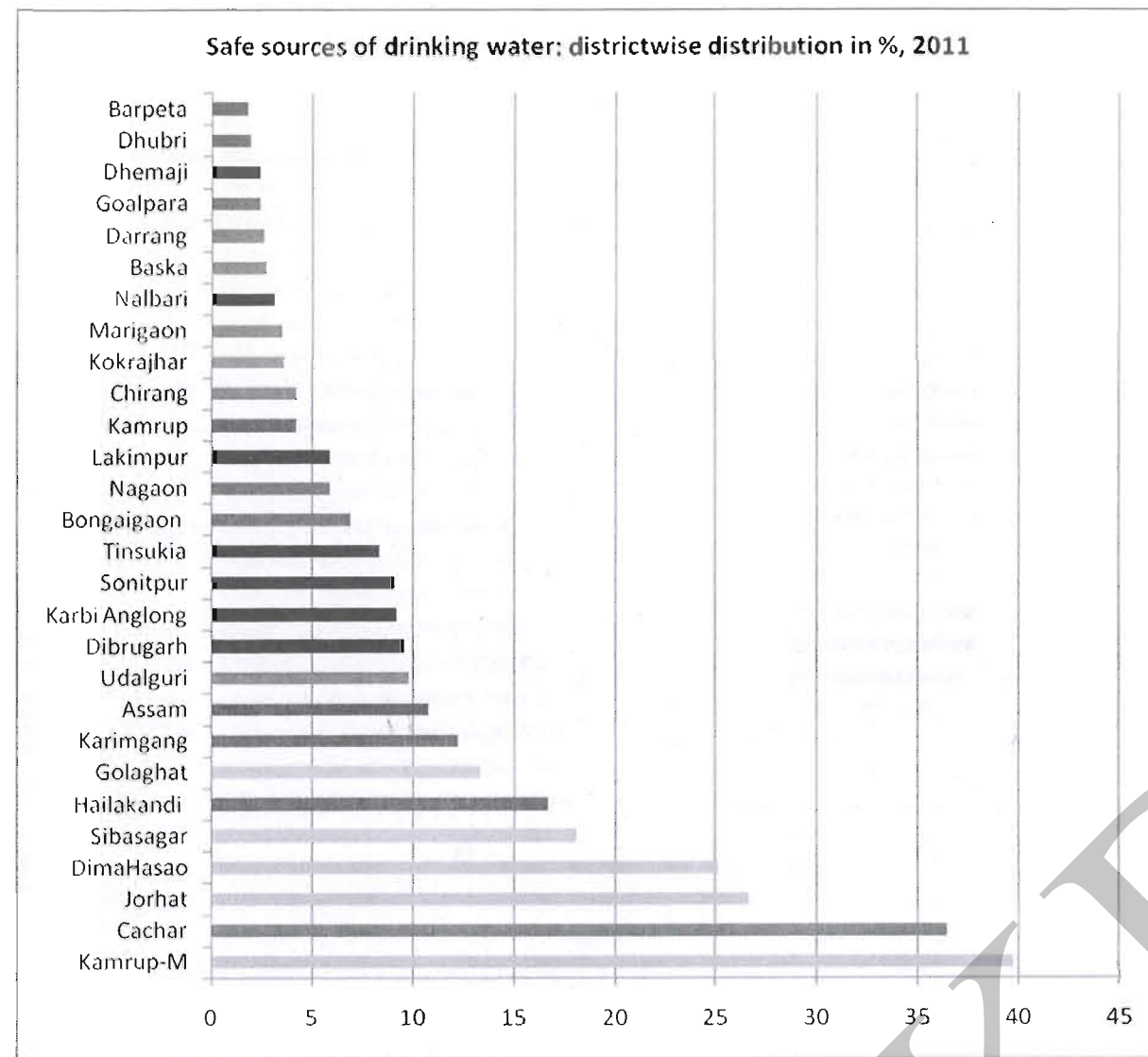


Figure: 7

