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ARTICLE

Exploring inequalities in India through housing overcrowding

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Abstract
The influence of economic development on the resorption of inequality levels in India is an open debate. Inequality shapes both the Indian society as a whole and, spatially, the different regions of this subcontinent-wide country. In this article, emphasis is given to the conception and to the spatial analysis of an indicator named "Non-Crowded Housing" (abbr. NCH). The latter uses official census data, is easily computed and focuses on the absence of housing overcrowding. This indicator offers a good alternative to explore the standard of living gap in India in terms of housing usage and unveil specific sub-spaces and trajectories within the 2001–2011 period. Census data are complemented with field studies in order to shed new light on the geography and nature of housing and spatial inequalities linked to rapid urbanization. The case studies reveal the strengths and weaknesses of the NCH index, which is able to provide a comprehensive overview of the human well-being, focusing on housing conditions only, though being scale-dependent and sensitive to urbanization levels.

Keywords India · Overcrowding · Housing conditions · Comparative housing · Social and spatial inequalities · Urbanization

1 Introduction

The recent economic growth of India has led to the formation of a strong middle-class,[1] but despite this fact; the country is also experiencing a steep increase in inequality levels. Large swaths of India's society are still considered as living under the international poverty threshold, let alone the deep social stratifications worsened by the caste system. The same can be said for city shapes, structures and dynamics since mass poverty and luxury integrated townships are sprawling and increasingly cohabitating over geographic space. For

[1] The increase of consumption in India is regularly highlighted by a large number of reports from private agencies (e.g. BCG, 2010; McKinsey Global Institute 2010).

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example, the Gini coefficient of household income rose from 0.32 to 0.38 between 1993 and 2009 thus further confirming rising inequality trends (OECD 2011). However, the Gini index has shown some limitations over time. For example, in a context where incomes are rising for the lower-class and rising even more for the upper-class, the extreme poverty is in a dynamic reduction phase while the Gini index increases. This is precisely what is currently happening in India. The percentage of the population living below the poverty line[2] declined from 37.2% in 2004–2005 to 29.8% in 2009–2010 and finally reached 21.92% in 2011–2012.[3] In India, we are thus in presence of a decreasing dynamic of extreme poverty associated with rising inequalities.

Both in term of human development and urban structure, the aforementioned appears even more relevant within megacities affected by faster urbanization processes. For a significant segment of the population, this dynamic is resulting in dramatic overcrowding, living and housing conditions, etc. (UN-Habitat 2001). Yet, we may not be in presence of spatial exclusion patterns in the conventional sense since poor areas are usually very dynamic and associated with low running costs. From this perspective, Saglio-Yatzimirsky and Landy (2013) point out that the Indian slums located in megacities are finally containing few real beggars.

This nation now faces rising inequality challenges associated with disproportionate population growth in some spaces,[4] insufficient job creation in the secondary and tertiary sectors (Census of India 2011), decreasing employment levels within the primary sector (a dynamic that accentuate the rural to urban migrations; Boillot 2007), etc. India is an intricate case study full of local and regional disparities that are too often neglected (e.g. Ramachandran 1989; Roy 2012; Fusco and Perez 2019). Moreover, with the more or less tight Indian caste system (here, too, geographical disparities exist), tensions between communities due to rising inequalities are unfortunately also a plausible and feared scenario. From this perspective, the aim of this article is to propose a new indicator using official census data in order to visualize and analyze in an alternative way inequalities and detect the areas with the greatest needs. The assumption is that it should be possible to characterize and quantify the Indian standards of living using a set of indicators focusing on the proportion of the population living in adequate housing conditions. As covered later in the text, some areas are particularly marked by high and/or low overcrowding values, sometimes in non-expected spaces. These results combined with the well-known urban/rural and local/regional disparities in India leads to a situation that requires further investigations in the form of qualitative fieldworks.

The text of the article is organized as follows. Section 2 recalls the urbanization and housing situation in India from an historical perspective. Section 3 gives a detailed review of societal well-being and housing conditions in India. The methodological Sect. 4 includes scale selection, housing indicators implementation and fieldwork methodology. Section 5 studies the spatial distribution and the evolution (2001–2011) of the calculated indicators. Sections 6 and 7 present the results of fieldwork performed in metropolitan and in non-metropolitan contexts in order to emphasize the results provided in Sect. 5. Section 8 concludes the article.

[2] As defined by the former Planning Commission: threshold of Rs. 27 in rural areas and Rs. 33 in urban areas per day.

[3] Reserve Bank of India database. https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/162T_BST130913.pdf.

[4] India is expected to become the most populous country by 2025 (UN World Population Prospects, 2017 Revision, https://population.un.org/wpp/).

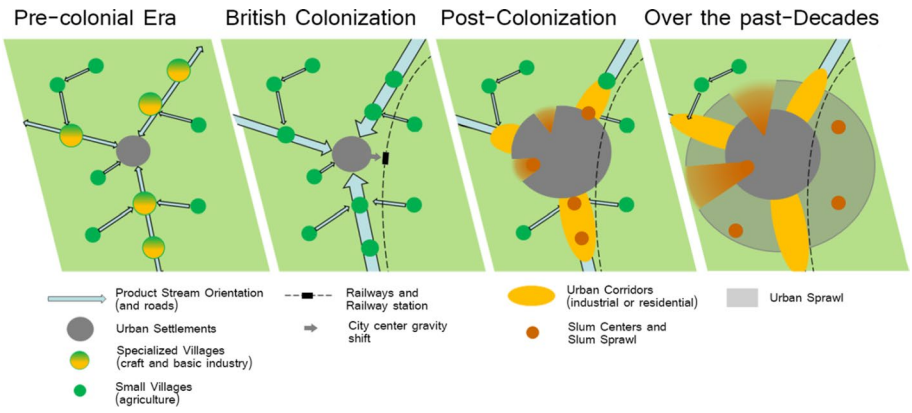

Fig. 1 Evolution of a Standard Indian Urban Center from the Pre-colonial Era up to the metropolitan phase

2 Rapid urbanization and rising housing inequalities in India

As compared to numerous countries (especially in America, Africa and Oceania), India possesses a complex and multilayered history of urbanization. *Harrapan*, *Aryan*, *Mughal Empire*, *Great Hindu Kingdoms*, *British Raj*, etc. are some examples of civilizations that, one after the other, have had an impact over India's global urban system. The interesting fact is that most of these urbanization waves were at some point in history associated with a de-urbanization dynamic. This section focuses on the rapid growth of India's cities and the housing challenges associated following the last rapid urbanization wave, the one that succeeded to the British colonization.[5]

Figure 1 model should be considered on a case-by-case basis since Indian cities progressed at different paces. Thumbnail 1 recalls that before the British colonization, villages close to main urban centers were usually specialized in craft and basic industry. Those settlements and the main urban centers were experiencing important demographic growth. Products were traded between cities and villages through the urban settlements and, as a result, the whole system was growing at a regular pace.

Figure 1, Thumbnail 2 shows the structural adjustments made during the *British Raj*. First, the development of railways (main frame completed in 1853) led to a shift of cities gravity centers toward the railway stations. Second, trade was drastically reduced since raw products were brought directly to the settlements possessing a railway station before being transported to the three new harbour cities (Bombay, Madras and Calcutta) and ultimately exported to Britain (vital asset to Britain's rapid industrialisation process). As a result, the majority of India's urban settlements declined or stagnated in term of industrialization and urbanization. The only exception is the new harbour cities that required extensive manpower and from which an important industry grew around. The combined population of these three cities grew from 500,000 inhabitants to 1.3 million between 1800 and 1850 (Bairoch 1985) while Calcutta alone, gained more than 500,000 inhabitants between 1850 and 1900. In these three cities, non-colonial suburbs started experiencing for the first time extremely dense and compact urbanization.

[5] Only the pre-British colonial era to nowadays are covered in this section. More information on urbanization and de-urbanization waves and their impacts over India's urban system: Sharma (1987, 2006), Ramachandran (1989) and Thapar (2006).

After the independence in 1947 (Fig. 1, Thumbnail 3) the revival of national trade, industrialization and urbanization created new employment opportunities in urban centers; instrumental in the historical industrialization process of India (Bharadwaj et al. 2009). Urban migrations were further reinforced following the partition of the Indian subcontinent (division of the former British India). Even if urban centers and hinterlands were working together again, the strong migration flows toward urban areas were not planned nor desired, and left the authorities unprepared to handle such large inward flows. As shown in the third thumbnail, this led to the constitution of the first real Indian slums located at the city outskirts or within the cores of towns and villages that were absorbed by urban corridors. While urban corridors developed industrial or residential functions (Ramachandran 1989), poor housing conditions and overcrowding were at the same time rising in the poorest city areas. With the addition of economic activities along urban corridors, multi-centrality, a major feature of the Indian cities, was again reinforced.

The growth of the industrial sector, particularly after the reforms of the 80s, contributed to both expansion and reinforcement of corridors as well as general urban growth. Figure 1, Thumbnail 4 shows the situation of the past decades in which the physical boundaries of urbanization have considerably widened. In central locations associated with high land and housing prices, strong urban pressure hinders further slums spreading. Slums are even sometimes removed following expropriations, resettlements or evictions (Patel et al. 2002; Hingorani 2011). According to Coelho et al. (2012), the slum resettlement processes often enhance the precariousness of the former residents instead of improving their conditions. These urban restructurings gradually bring new socio-spatial configurations of urban poverty with settlements continually supplying unskilled workers for local firms.

Further away, old villages and small towns caught up in the fast urbanization processes are transformed into overcrowded slums. Amongst them, places not benefiting from any locational advantages (proximity to infrastructures, central areas, etc.) keep on growing and spreading. In today's India, 200 million people are officially living in slums, those areas being sometimes even home of more than half of the population in some saturated megacities (Roy et al. 2011; Dewan-Verma 2002). Nowadays, urban centers are even merging through their corridors thus giving shape to impressive urban macrostructures (Perez et al. 2018). In these spaces, urban transition remains the hardest challenge due to lagging development in term of infrastructure and service (Bhagat 2011), increasing socio-economic inequalities, unplanned urban sprawl, etc.

3 Societal well-being and housing conditions in India

The decades that followed the Indian independence were characterized by socialist policies, a model that led to expensive governmental programs of income and wealth redistribution (Thakur et al. 2012). However, since the middle of the 80s, India is trying to reduce poverty by prioritizing economic growth.[6] This period matches the apparition of numerous studies demonstrating the link between urban, economic and per capita income growths in

[6] Following this logic, India has experienced several major waves of reform in the 80s, 90s and 2000s decades which have brought positive results to the GDP growth (around 3% in the late 80s, 6% in the early 90s, 8–9% in the early 2000s).

India (e.g. Mills and Becker 1986). In the last few decades, these researches have matured in establishing that low-income households are likely to be better off in large cities than in small settlements and rural areas (Mills and Mitra 1997; Mitra 2014) or that per capita economic growth is reducing the incidence of slums (Arimah 2010). At the same time, economic growth (even more than per capita economic growth) leads to better job opportunities thus enhancing migrations to large cities, a key factor influencing the emergence and growth of slums (UN-HABITAT 2016). Before going further, it should be noticed that incomes are not inquired by the Census of India (the government nonetheless regularly release its own calculated HDI at the state level). As a result, the study of the prevalence of slums, "*the face of urban poverty*" (Arimah 2010), has stood as a proxy for the study of urban poverty in general (IIHS Publication 2014).

In 1990, the first Human Development Report opened with the following premise "*People are the real wealth of a nation*" (United Nations 1995). This report introduced for the first time a new paradigm to shift from top-down macroeconomic approaches to more people-centered policies. Indeed, growing concerns about the inability of GDP and per capita GDP increase to improve quality of life appeared by the beginning of the 90s. Sen (1988) had already paved the way by stating that desire fulfillment (obtainable through per capita GDP increase) as a method of valuation was often defective since "well off" and "being well" should be considered as fundamentally different concepts. The methods using owned amenities and assets to assess societal well-being levels were ruled out and gradually replaced by composite indicators such as the *Human Development Index* (HDI, made of income, education and life expectancy), the Gini coefficient, *Gross National Happiness* (GNH, used by Bhutan and recognized by the UN), the *Better Life Index* (eleven dimensions of well-being identified by the OECD), etc. The issue with increasing per capita income was that such dynamic does not lead to a balanced redistribution of the standards of living, a fact especially true in India's urban environments (Jha 2000; Acharyya 2006). Indeed, urban environments are deepening income inequalities, thus offsetting "*the benefits of increasing per capita income* […]" (IIHS Publication 2014). The shift in how to address urban poverty reached its peak in 2015 with the presentation of the Sustainable Development Goals (SDGs). This UN initiative identify 17 global goals as targets to achieve by 2030. First target of the SDG 11: Sustainable Cities and Communities is to "*ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums*". This denotes that slums are more and more considered as perennial part of the urban environment that shall now be "upgraded". The Participatory Slum Upgrading Programme (PSUP) reflects this trend by trying to integrate "*slum dwellers into the broader urban fabric*".

To sum up, in India, high levels of per capita income tend to increase urbanization, rapid urbanization tends to increase slum prevalence and researchers tend to use slum prevalence as a proxy for studying urban poverty. Yet, there are various definitions of the term "slum" according to the national laws, the state laws, the United Nations, the common parlance, etc. In India, *"slum dwellers are in a twilight zone of illegality in which they may be tacitly permitted to reside till the law, and power are exerted to forcibly evict them"* (Ramanathan 2005). In this article (and because of the ambiguity of the term), a slum is simply considered as a place where the urban poor find shelter and housing thus forming a dense cluster with coherent physical features. Moreover, the goal of this research is to measure the proportion of the population living in non-crowded housing conditions. When it comes to living conditions, "slum" is only a term used to categorize poor housing. Urban poverty is not only located in slums and clusters of poor suburbs are sometime more excluded and vulnerable than slum dwellers (IIHS Publication 2014). The Indian government, not

blind of these issues, implemented a 'National Urban Housing and Habitat Policy' (Government of India 2007) within the aim of promoting '*sustainable development of habitat in the country* […]' and reach '*affordable housing for all*'. This brings the following question, at a national or international scale, what kind of data/systems of measure are available to assess dwelling's quality? Three possibilities appear:

1. Census data or composite indicators derived from Census data. The advantage of this category is that it allows international comparisons since national censuses are usually enquiring identical topics (or almost identical).
2. Distinct systems of measure made by governmental entities, associations or agencies. Data are usually more detailed than the previous category. The whole population may be enquired but these systems of measure remain national initiatives thus limiting international comparisons. Examples of such are the United Kingdom's 'Housing Quality Indicators' system measuring housing quality using 10 indicators (location, accessibility, size, sustainability, etc.); Switzerland's 'Système d'évaluation de logements' using 25 criteria (mostly on building quality criteria), etc.
3. Distinct surveys/approaches made by research institutes or researcher teams. Detailed and custom-made data are usually gathered since these studies cannot afford to target more than a small fraction of the population or a study area. Kurian and Thampuran (2011) conducted for example questionnaire surveys of a selected group in Kerala to assess housing quality requirements. The questionnaire had 47 factors ranked from 1 (not important) to 5 (very important) by the enquired population.

A prerequisite for this research is to build an indicator that can be calculated at any scale using open-source data (in order to be applied in other countries than India if needed). In addition, the indicator shall not focus on a specific category of housing (slums, gated communities, etc.) or population (poor urban, rural areas, etc.) but it shall be possible to apply it to some specific categories if needed. The inequalities we want to study are not only those reflecting social divides in a given place, but also spatial inequalities in geographic space. This, of course, poses the question of the spatial units over which the analyses will be carried out. Last but not least, owned assets as a method of valuation of societal well-being are ruled out (Sect. 2 discussion).

4 Methodology

4.1 Scale selection

In order to study the geography of housing conditions in the whole of India, administrative districts have been chosen as unit of the analysis. At the national scale, the district is a practical window for observing India's diversity. Some districts are almost completely rural (with practically no urban areas within them), others host several small and mid-sized cities, and others coincide with a larger metropolitan area or are just part of it. The Indian territory, as of 2011 (last census) is composed of 640 districts with an average of 5136 km^2. Administrative boundaries are dependent upon the administrative entity that has the authority to conduct the census but yet this average remains representative due to the spatial homogeneity of these units. Still, there are a few exceptions such as:

- The very center of large cities and metropolitan areas that often possess its own district (such as Chennai, Kolkata, etc.).
- The largest metropolitan areas (namely Delhi and Mumbai), which are subdivided into several districts.
- The seven union territories which are smaller and less populated than the average (Pondicherry, Andaman and Nicobar Islands, etc.).
- A handful of very large districts (such as Kutch, Kashmir, etc.).

Overall, the spatial homogeneity of this level is relatively satisfactory. Knowing that individual trajectories of households are influenced by the environment in which people are living, this level of analysis may allow identifying relevant sub-spaces at the national scale.

4.2 Non-crowded housing conditions (NCH Index) calculation

As discussed in Sect. 3, studying how societal well-being is distributed at a macro-scale is a complex issue. Part of the challenge is to focus on specific aspects which may be considered, at least to some extent, as close to the realities experienced by the population. The indicator built in this section aims at quantifying the housing condition levels based on the weighted average of the dwelling size (number of rooms) in relation to the household size (number of peoples). The Oxford English Dictionary defines overcrowd as "fill (accommodation or a space) beyond *what is* comfortable*, safe, or permissible*". In light of the Sustainable Development Goal 11 and of the 'National Urban Housing and Habitat Policy' discussed previously, overcrowding shall be considered in this study as accommodations filled with inhabitants beyond what is safe or adequate. The indicator is then going to focus on the rate of household per district living in non-crowded housing conditions (abbr. NCH). Before proceeding, we stress out that more detailed data, such as the house sizes, could be used to ponder the NCH indicator. However, as stated before, these are rarely enquired within censuses.

After acquiring the 2001 and 2011 housing and amenities censuses,[7] the first step was to define a required minimum number of dwelling units by category of household size based on international benchmarks of living conditions. The increase of dwelling surfaces per inhabitant for the middle and upper middle-classes is a global trend which can be observed in most developing economies. However, the criteria used to calculate poor and inadequate housing conditions are diverse and non-standardized between countries (Join-Lambert et al. 2011). For the French census agency (INSEE), a minimum number of dwelling units by household size is used to identify overcrowded conditions: a couple without children needs at least two dwelling units in order to not be considered as living in overcrowded conditions, while a couple with one child needs three dwelling units. In the Indian census, as in most censuses, the number of dwelling units is enquired but not analyzed in terms of overcrowding.

[7] Are enquired in the Indian housing and amenities Census: the material out of which a house is built, the number of dwelling units, the source of drinking water, the source of lighting, the fuel used for cooking and the assets available (computer, phone, etc.). A household is defined as "[…] a group of persons who normally live together and take their meals from a common kitchen unless the exigencies of work prevent any of them from doing so. Persons in a household may be related or unrelated or a mix of both. However, if a group of unrelated persons live in a census house but do not take their meals from the common kitchen, then they are not constituent of a common household. Each such person should be treated as a separate household. The important link in finding out whether it is a household or not, is a common kitchen. There may be one member households, two member households or multi-member households […]" Census of India (2011).

Fig. 2 Number of dwelling units (rooms) in the Census of India. *Source*: Office of the Registrar General (Census of India 2011)

Table 1 Thresholds of required number of rooms by number of people within the household

Acronym	Household size	Dwelling room threshold
H_1	1–2	1
H_2	3–4	2
H_3	5	3
H_4	6–8	4
H_5	More than 9	5

According to the housing census *"a dwelling room does not include kitchen, bathroom, latrine, store room, passageway and veranda which are not normally usable for living.* […] *In another situation when there is only one room in a Census house used as a shop or office the unit will not be recorded as a dwelling room."* Census of India (2011). A dwelling unit used as a shop or as a workshop is not considered as a potential room (Fig. 2) within the Census of India while it is common knowledge (also confirmed by fieldwork, Sect. 6) that in poor suburbs and slums in India, such kinds of units are used as sleeping units during night-time. To counterbalance this fact, the minimum number of dwelling rooms required for each category of household size has been reduced by one as compared to the French benchmark of the INSEE.

NCH formula

$$\mathrm{NCH.D_X} = \left(\frac{H_1 + H_2 + H_3 + H_4 + H_5}{Hx} \right) * 100 \tag{1}$$

$\mathrm{NCH.D_x}$ = Share of Non-Crowded Housing within district x; Hx: Total number of household within district x; Hi = households not suffering from overcrowding (by category of size).

Households possessing the required minimum number of dwelling rooms according to their household sizes are not considered overcrowded (thresholds are given in Table 1). Equation (1) is then calculated for every district. The indicator outcome is the share of households not suffering from overcrowded conditions. This indicator has been calculated for 2011 and 2001, which allowed studying the 2001–2011 evolution. It has also been calculated for the Scheduled Castes (SC) only. The scheduled castes term refers to the lower caste in India. It is important to note that for this research, no assumptions are made at this stage between housing conditions and scheduled castes.

4.3 Fieldwork methodology

The fieldwork selection has been made following a clustering of Indian districts (Fusco and Perez 2019) using a dataset made of several indicators (housing, urbanization and socio-demography) from which the index discussed in this article is of uttermost importance.[8] Section 6 reports on fieldwork from four different locations picked amongst the metropolitan districts: the Dharavi slum cluster in Mumbai, another slum cluster in Bangalore, two gated communities in Bangalore. The last section reports on fieldwork in urban follower and well-off ecosystem districts: the Hubli-Dharwad twin city region in north Karnataka and the Himalayan region of Kullu in Himachal Pradesh.

NGOs, private foundations and companies introduced our team to some case studies and key peoples living in them. The SELCO foundation (specialized in affordable lighting systems for low-income customers) introduced us to the slum cluster in Bangalore and provided contacts in Dharwad, Biodiversity Conservation India Pvt. Ltd. (BCIL) introduced our team to the ZED gated community and their inhabitants while URBZ consultancy was of a great help in Dharavi.

The methodology for the fieldwork is made of field observations, semi-directive interviews and open discussions with dwellers, land owners and promoters. The objective is twofold: (1) check if the NCH indicator is well conceived and truly closer to the reality experienced by the people than some indicators that may appear too technical (HDI, Gini index, etc.). This shall be done by obtaining, for each case study, an overview of housing conditions before comparing these overviews to the index scores. (2) Obtain a preliminary assessment of the indicator general results through the concomitant study of housing, urbanization and economic development levels. Fieldwork was conducted in April 2013 (Mumbai), March 2014 (Kullu and Bangalore) and February 2014 (Dharwad). All pictures have been taken be the authors of this article.

5 Exploring the living conditions through the non-crowded housing indicator

Mapping the indicator results for Indian districts is a good way to visualize the spatial inequalities in housing conditions. Districts with high share of NCH are close to or similar to western average values. Inversely, a low share means widespread overcrowded living conditions.

Left map of Fig. 3 displays the spatial distribution of the NCH indicator at the district level. The first striking peculiarity of the Indian space is the high level of NCH of the coastal part of south-western India, especially within Kerala. In this sub-space, the urbanization processes along the coast do not follow the general framework detailed in Fig. 1. Firoz et al. (2014) points out that Kerala was ruled by more than 100 principalities before the *British Raj* and that the confluence of exogenous factors prevented the establishment of a unified Kingdom. Today, a gigantic continuous urban area in which rural and urban habitats and lifestyles are strongly interconnected stands out without the presence of a metropolitan core (Perez et al. 2018). Some districts located in high grounds (and thus also

[8] Dataset including the NCH indicator (under the name of RES_WELLF) all the indicators used in the cross-analyze and a geospatial layer of the Indian districts is available at: https://zenodo.org/record/2563213#.XOz6Pc2YS8E.

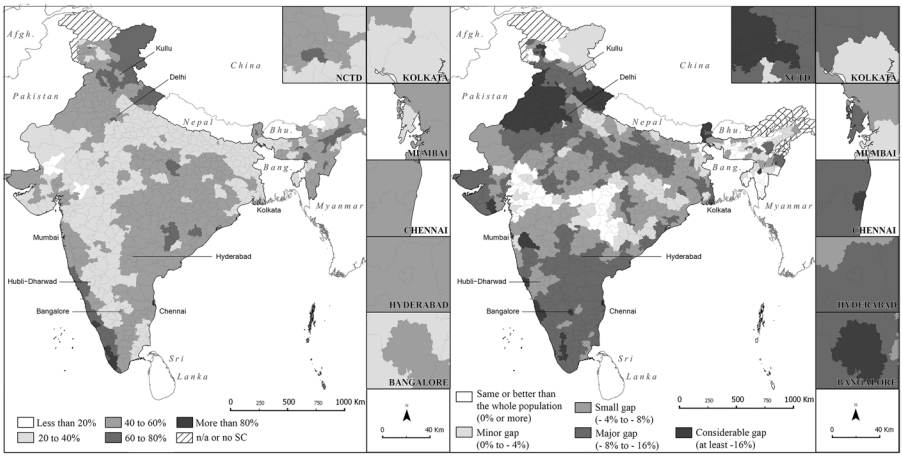

Fig. 3 Left: 2011 NCH for the Whole Population. Right: NCH for scheduled castes in 2011, difference between the whole Population

deviating from Fig. 1) are not suffering from overcrowded housing conditions such as in Himachal Pradesh, Uttarakhand, Meghalaya, eastern part of Assam, etc. These districts are located far away from the heavy transportation infrastructures (few or no highway, railway stations, airports, etc.). Access to infrastructures and services are often correlated with economic growth, with for example the road density likely to increase the income index (Sapkota 2014). However, in this case, infrastructures endowment and services cannot explain the high levels of NCH thus suggesting cultural peculiarities. In order to obtain a better understanding of these results, a field study will be performed within a district located in Himachal Pradesh (Sect. 7).

The most overcrowded areas of India can be divided into two sub-spaces. The first one is a horizontal strip starting in Delhi and reaching the Bay of Bengal. This space goes through Uttar Pradesh, Bihar and West Bengal and finally mostly follows the Ganges River. With an average of only 20 to 40% of people not living in overcrowded houses, this first zoning shows a part of India with strong traditional characteristics. These three states sustain for example the biggest demographic growths of India (Census of India 2011), poverty is important and stagnating (e.g. World Bank Poverty threshold), they contain a lot of small and mid-sized cities and villages (Ramachandran 1989), etc. Moreover, in most of Bihar and Uttar Pradesh districts, half of the households are composed of at least 6 members (Census of India 2011) thus showing strong socio-demographic resistance to the general trend of reduction of household size. The second sub-space is a vertical strip starting from Delhi and going through the Deccan plateau toward southern India. This area contains few big cities and not a single metropolitan area. The lifestyles here are definitely rural-oriented but it should be noted that Orissa and Madhya Pradesh states (located East of continental India), which are also rural-oriented, show better values (40–60% of non-overcrowded dwellings). It is interesting to note that if the poor living conditions in dense cities in the eastern belt (Uttar Pradesh, Bihar and West Bengal) are notorious facts, there is at this stage no explanation for the comparable results displayed by this vertical belt. From this perspective, a field study has been performed in a mid-sized city located right in the middle of this strip: the Hubli-Dharwad conurbation (Sect. 7).

The six main metropolitan areas of India are magnified in the map. As far as housing conditions are concerned, their situations are on the Indian average (40–60%). The exceptions here are Mumbai, with much overcrowding in its central district, and New Delhi. Like other large metropolitan areas, the capital city of India is characterized by intermediate housing condition levels in its most central districts, but also by sharp contrasts within its southern peripheral districts, in the Haryana state. Delhi being subdivided into several districts, it can be assumed that strong housing condition disparities characterize other large Indian metropolises. Bangalore, a metropolitan area particularly disconnected from its regional environment is also worth mentioning, the latter being characterized by low values of NCH contrary to the central district.

NCH only allows to assess housing quantity, and even this in a rather qualitative way (by using number of rooms, more easily available in official census, in India as in other countries, than actual dwelling surface). Nevertheless, in addition to deal with housing quality through fieldwork (Sects. 6 and 7), we can deepen the study of living conditions in India's districts by cross-analyzing NCH with building quality, amenities and household equipment. As in Switzerland's already cited database, information about housing stocks, conditions and amenities are available within the 'housing and amenities Census' section of the Indian census. From the 2011 census we thus retrieved the percentage of households having stone, metal or concrete walls (as opposed to having grass/thatch/bamboo/plastic/polythene/mud or unburnt brick), the percentage of households having hard concrete floors (mosaic, tiles and cement as opposed to mud), the location of the latrines (inside the premises or not) and the share of household possessing none of the following assets, which are considered to be normally present in most middle-class dwellings in affluent countries: a car, a motorbike, a telephone, a computer, a TV-set.

This overall description of housing quality, amenities and household deprivation seem weakly correlated with housing overcrowding (R^2 of 0.03 for wall materials, 0.14 for floor materials, 0.24 for latrines and 0.12 for household deprivation). By using median values as dividing thresholds, we can thus identify four subgroups of Indian districts (Fig. 4) for each combination of indicators. The cross-analyze of NCH with wall and floor materials follows the same spatial distribution. Latrine locations and household deprivation also follow a similar distribution (household deprivation has thus not been mapped). The only exception is Uttar Pradesh showing less household asset deprivation and walls of better quality than the poorer districts of Bihar and West Bengal. The two main sub-spaces of housing overcrowding, the Deccan and the Ganges axes, show further inner differentiations. In the Deccan for example, the distinction between the eastern and the western part is striking. In Eastern Deccan, Orissa, Chhattisgarh and Jharkhand show relatively low housing overcrowding despites similar levels of amenities and assets thus showing potential cultural differences in heavily rural contexts. Low housing overcrowding, good amenities and low asset deprivation is once again the specificity of districts in Kerala, coastal Karnataka, inner Tamil Nadu, the southern metropolitan areas of Bangalore, Chennai and Hyderabad, but also of the northern states (rural and urban Punjab and mountain districts with tourism and residential-based economies). Overall, if we focus only on building materials (walls and floors), a richer India stands out in the South and around Delhi.

The NCH indicator for the scheduled castes shows the same spatial distribution than the whole population. Mapping differences (Fig. 5, right) is thus necessary in order to highlight eventual gaps between scheduled castes and the rest of the population in terms of living conditions. Overall, overcrowding is more common among the scheduled castes, producing negative gaps of NCH in almost all Indian districts. This is a legacy of inequalities

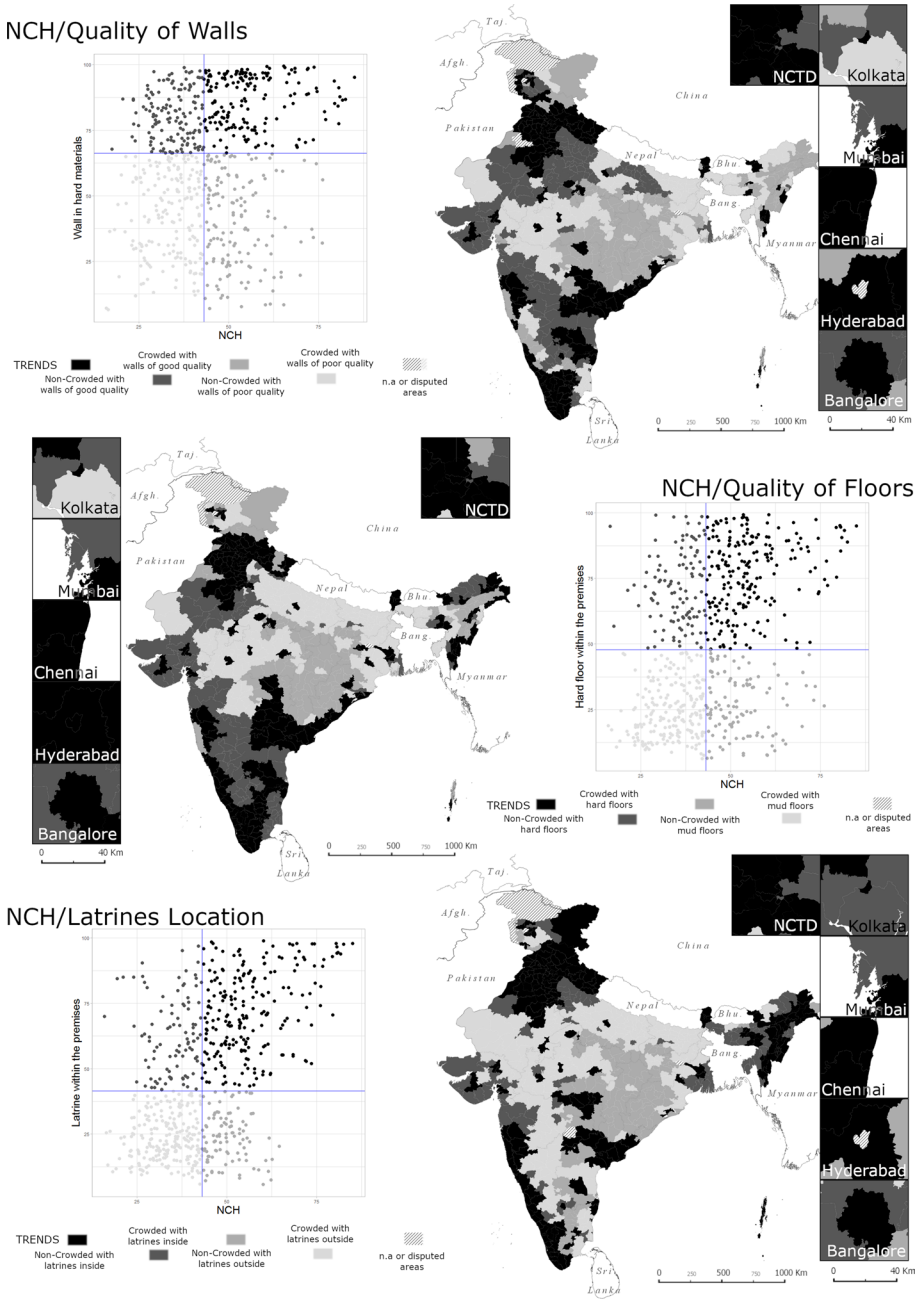

Fig. 4 Non-Crowded Housing and Walls quality, Floors Quality and Latrines Location

linked to the traditional cast system (Bayly 1999) despite Aiyar's claim of the catching up of living standards of the scheduled castes during the last 20 years of economic reforms (Aiyar 2011).

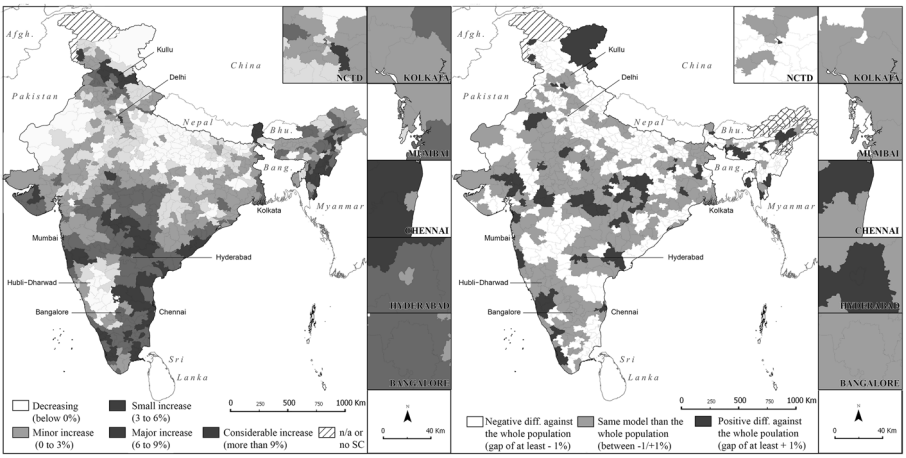

Fig. 5 Left: 2001–2011 NCH evolution. Right: 2001–2011 NCH evolution for scheduled castes, difference between the whole population

This is another way to show the endurance of the caste system in modern India. NCH disparities are stronger in the North (and particularly in Punjab and in the North-East) and in the South. They are less intense in the central state of Madhya Pradesh, where overcrowding is the lot of most of the inhabitants. Maharashtra, Gujarat and Chhattisgarh are more complex to analyze, with strong internal disparities among districts. The case of the largest metropolitan areas is also interesting. Far from abolishing the influence of the caste system, the migration from rural areas to globalized metropolises preserves caste disparities. Housing well-being gaps are thus stronger in the metropolitan areas than in the surrounding regions, with the noticeable exception of Kolkata. Presuming that scheduled castes are poorer than the rest of the population, we may wonder if, as discussed in Sect. 3, low incomes are really better off in large cities.

The short-time dynamics of NCH between 2001 and 2011 are also interesting in order to understand development trajectories within India. For the overall population (Fig. 5, left) the most important improvements of housing conditions are to be found in districts which also show the highest well-being values in 2011 (Kerala, Himachal Pradesh, etc.). Nevertheless, the coastal area of Tamil Nadu (in the South) or of Gujarat (in the North) show strong improvements despite less than average values in 2011. Their trajectories are typical of areas where socioeconomic development is particularly intense and recent. Overcrowding was particularly severe in 2001 and is being gradually resorbed. At the opposite, the northern strip along the Ganges River was not only characterized by widespread overcrowding in 2001, but also by decreasing housing conditions over the 2001–2011 decade.

Several authors indeed argue that the development levels of Indian States are converging (Banerjee 2015), or at least not worsening (Singh et al. 2003, 2013). Dholakia (2003) even suggests that economic growth at the state level should address the issue of disparities in income and human development. However, there is a dispute on this subject since other authors highlight the rising disparities in term of human development between the different Indian states (Ahluwalia 2002; Roy 2012). Our findings, although focused on housing condition evolutions only, are supporting the latter trend, since in term of housing conditions, the poorer states are not catching up with richer ones. The cores of the main metropolitan

areas are usually characterized by lower improvement of housing conditions than their peripheral regions. Are negative and positive externalities of metropolitan growth differently distributed between center and periphery, or are the evolutions possibly hampered within the Indian megacities due to strong population and urbanization density? Bangalore is once again an exception: the observed independence of the metropolitan NCH opposed to the overcrowding of the surrounding rural districts (Fig. 3) is to be correlated with the concomitant increase of housing conditions in both subspaces.

The spatial structure of the evolution of the gap between the overall population and the scheduled castes (Fig. 5, right) is much less clear within the Indian Union. Two-thirds of the eastern belt (Uttar Pradesh and Bihar) are nonetheless clustered and show a negative gap, thus showing that in addition to decreasing living conditions over the 2001–2011 decade the situation is also worsened for the scheduled castes.

6 Complementing results with field studies in the land of extremes: metropolitan India

Most of the slums in India are either old village centers caught up by the urban sprawl of larger cities or more recent constructions located in the interstices of urban areas of higher standards (Fig. 1). One of the most vivid example is Dharavi located in Mumbai (29% NCH, 01-11 evolution +3.4%), a suburb depicted as a living cliché of misery by mass media and at the same time as a place possessing strong links to global economy (e.g. Saglio-Yatzimirsky 2013; Weinstein 2014).

In term of housing, Dharavi urban landscape can be divided into two categories: the tool-houses (Fig. 6, pic.1) and the high-rise buildings (Fig. 6, pic.2). A tool-house can be considered as the combination of several working and living units within a compact house. Typically, a tool-house is a two or three story building with each floor divided into two units. Units exclusively used as residential dwellings are in minority and often occupied by a unique extended family renting the premises to local entrepreneurs possessing several tool-houses. Number of residents in such units was always reaching the upper threshold defined in Sect. 4.

A broad range of activities are performed within the tool-houses. Some units are specialized into leather and textile products (luxury wallets, shoes, etc. to be exported in India and aboard), chapati production (unleavened wheat flour bread), etc. In such workshops, each worker is assigned to a 1-m^2 workstation and the units are usually containing more than fifteen workers (Fig. 6, pic.3). The tool-houses ground floors are most of the time rented and transformed into non-industrial local businesses (grocery shops, restaurants, etc.), most of the time used as residential dwellings during night-time, thus not contradicting the dwelling room threshold defined in Sect. 4. Some blocks possessing more "industrial" features can be found (Fig. 6, pic.4) people are not living in this area since a wide range of activities involving heavy machineries and polluting materials are performed (recycling and reconditioning, sorting of wasted electronic components, textile chemical dyeing, plastic processing, etc.).

With such a system of workshops capable of rapid adaptations, daily wages in Dharavi are above the national average level (e.g. Weinstein 2014). However, this economic dynamism has not swept away the most recurring problems found in slums (child labor, insalubrities, lack of basic urban infrastructures, etc.). The Slum Rehabilitation Authority of Mumbai (SRA) has been trying to enhance the living conditions of the Dharavi's

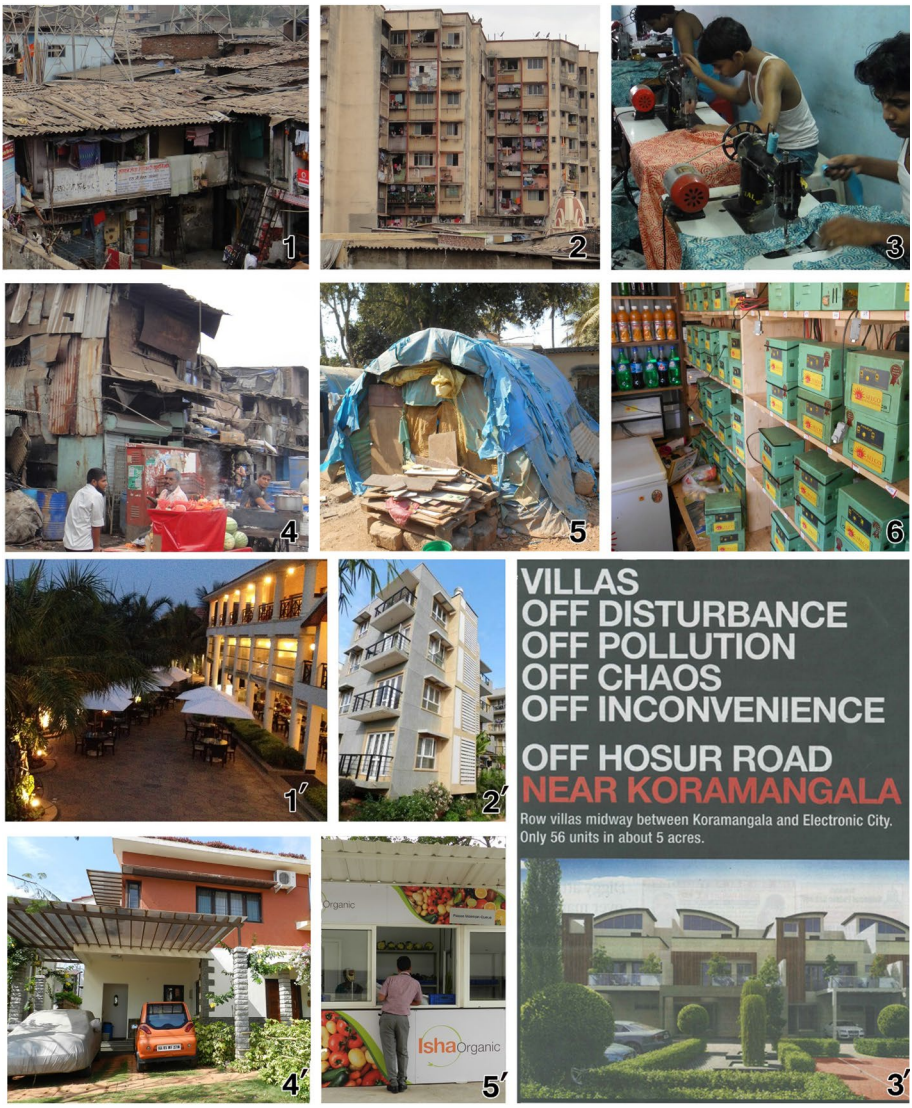

Fig. 6 Slums and gated communities picture set

inhabitants for more than 20 years.[9] Yet, their plans are today put on hold due to strong resistances from the community. A short glance at Fig. 6, pic.2 shows that the standardized, high-rise social housings proposed by the municipality are not at all suited for the

[9] The strategy of these rehabilitation plans was simple, the private sector had to build free housing for Dharavi inhabitants and in exchange, the state government gave to the builders the newly created land surplus (Zubrzycki 1997). The buildings found in Dharavi are social housings constructed through the Slum Redevelopment Scheme of 1991 or the Slum Rehabilitation Scheme of 1996.

auto-organized, cost-effective and dynamic daily routine of Dharavi. It is impossible to start a profitable activity in these new housing units, hence the resistances.

Slums in India are generally not as dynamic as Dharavi is. The worst living conditions are found in the off-grid slums built in the interstices of the city landscapes. Usually these slums are recent constructions related to the ongoing rural to urban migrations. They are not built in concrete materials and are totally disconnected from both electricity and water networks. No business or manufacturing activities are taking place in those settlements. Most of the inhabitants are newcomers from rural India that have migrated to cities for employment. Males living in these slums are often employed informally as unskilled workers into the construction sector and earn never more than a few hundred INR per day. Figure 6, pic.5 displays an example of such slums located in the southern outskirt of Bangalore (53% NCH, evolution of +7%). Each tent is composed of a single dwelling unit hosting an entire family, with a number people obviously reaching the upper threshold defined in Sect. 4. In this context, poor housing conditions and overcrowding are definitely to be associated with misery, a dynamic going beyond what the simple NCH indicator can measure. Moreover, despites the high quality of the Indian Census, these slums are built without any authorization and thus not perennial as a space like Dharavi is. It is interesting to note that during our visit a private foundation[10] built a community center and covered it with solar panels in order to improve the living conditions. It created a new centrality within the urban landscape. During the day, the solar panels are recharging batteries that are lent to the slum dwellers during the night (Fig. 6, pic.6). The batteries are powerful enough to provide lights in the tents until the next day.

Suburban development in Indian megacities is also characterized by a proliferation of gated communities, a phenomenon fostered by the return of former expatriates in India. These private neighborhoods are increasingly independent from the municipality in which they belong (amenities, power supply, etc.). The Indian gated communities are in all aspects similar to model found around the world (controlled entrances, cleaned streets, speed regulation, similar fashion in construction style, etc.). For example, the private neighborhood "Palm Meadows" in Bangalore contains 500 single-family houses with a monthly rent varying between 80 k INR and 400 k INR according to the villa size. More than a gated community, this suburb can be considered as a living complex since it possesses its own supermarket, several restaurants, varied sport and recreational facilities (Fig. 6, pic.1′), a luxury hotel, a night club, etc., making thus possible to stay within the community for all kinds of daily activities. According to one of Palm Meadows's promoters, this gated community was originally full of foreigners occupying senior positions in multinationals doing business in India, but now more than half of the inhabitants are Indian families possessing more dwelling units than their household size (number of children varying between 0 and 3).

As this model expands in megacities, a reject of the traditional features of the Indian society appears. Figure 6, pic.3′ shows an ad found in a local newspaper of Bangalore promoting a new complex *"off-disturbance, off-pollution, off-chaos, off-inconvenience"*. It seems that the promoters are intentionally highlighting the "off-India" features of their modern living complexes. Indeed, disturbance (or at least noise) and pollution are found in several megacities around the world, but the ad seems to suggest that chaos and inconveniences, too, are the norm in India's. Also, despite the importance of religious life within

[10] More information about this foundation in Sawamura and Amiraly (2015).

Indian society (Bayly 1999), it is interesting to note that not a single temple in all the visited gated communities has been found, showing the difficulty of introducing elements of traditional community life in the self-selected context of gated communities.

Other cluster areas taking the shape of gated communities are also taking into account present-day environmental concerns. Such initiatives can be found in India with for example the ZED eco-districts[11] (Zero Energy Homes: Fig. 6, pic.2′ and 4′). In most of the cases found within our fieldwork, families living these eco-districts are Indian activists concerned by environmental issues. The studied ZED eco-district contains 120 households living in off-grid houses built with specific materials in accordance with the wet climate of Bangalore. Solar panels are covering each house, organic vegetable gardens are found all over the place and a collective harvesting/filtering rain water system is operating for the whole community. The average monthly income of the households living in ZED is about 5000€ (4–5 INR lakhs a month) ant the number of dwelling units is in accordance with the household sizes (average of 2–3 children per household). People living in these areas can be considered as trend forerunners testing new sustainable solutions. For example, some households living in ZED own an electric car (Fig. 6, pic.4′), other are buying organic food (Fig. 6, pic.5′), etc.

7 Complementing results with field studies in Dharwad and Kullu districts

Dharwad district[12] is located in the northern part of Karnataka within the Deccan plateau and within the vertical strip identified in Sect. 5. With only 36% of households living in adequate housing conditions, the score of this district is below the national average but remain nonetheless above a significant number of megacities. Yet, the housing conditions have worsened in 10 years (−2.8%). Hubli and Dharwad, the main cities of this district, possess a polycentric urban structure that follows the model displayed in Fig. 1. The southern parts of both cities contain the old urban centers, nowadays both popular and inexpensive neighborhoods. As compared to the previous case studies, the inquired households in these parts of the towns do not reach the upper limit (9+ as defined in Sect. 4) but are rather composed of 5–8 members. These areas remain dynamic with a large number of small scale workshops scattered all over the place. These small units can roughly be compared to the tool-houses found in Dharavi without any combined residential functions (Fig. 7, pic.2). A broad range of mixed urban fabrics are found around the old centers including even heavy industries. These neighborhoods are poorer and more densely populated (Fig. 7, pic.1) than the modern hyper-centers (Fig. 7, pic.5) but yet we are not in presence of extreme poverty. Some households living in poor conditions can be found in precise locations (along the railroads, behind Unkal Lake, etc.) but as displayed in Fig. 7,

[11] built by Biodiversity Conservation India Pvt. Ltd. (BCIL) http://www.zed.in/.

[12] Hubli and Dharwad: two main cities only 15 km away which have physically merged into a single built-up area are the economic nerve of this district. Due to their proximity, they are referred to as twin cities and considered as a single conurbation by the Indian Census. Hubli-Dharwad conurbation is composed of 943.788 inhabitants and the entire district of 1.84 million inhabitants. With a population of 786.018 inhabitants in 2001, Hubli-Dharwad sustained an impressive growth of 20.06% in only 10 years. Source: Census of India.

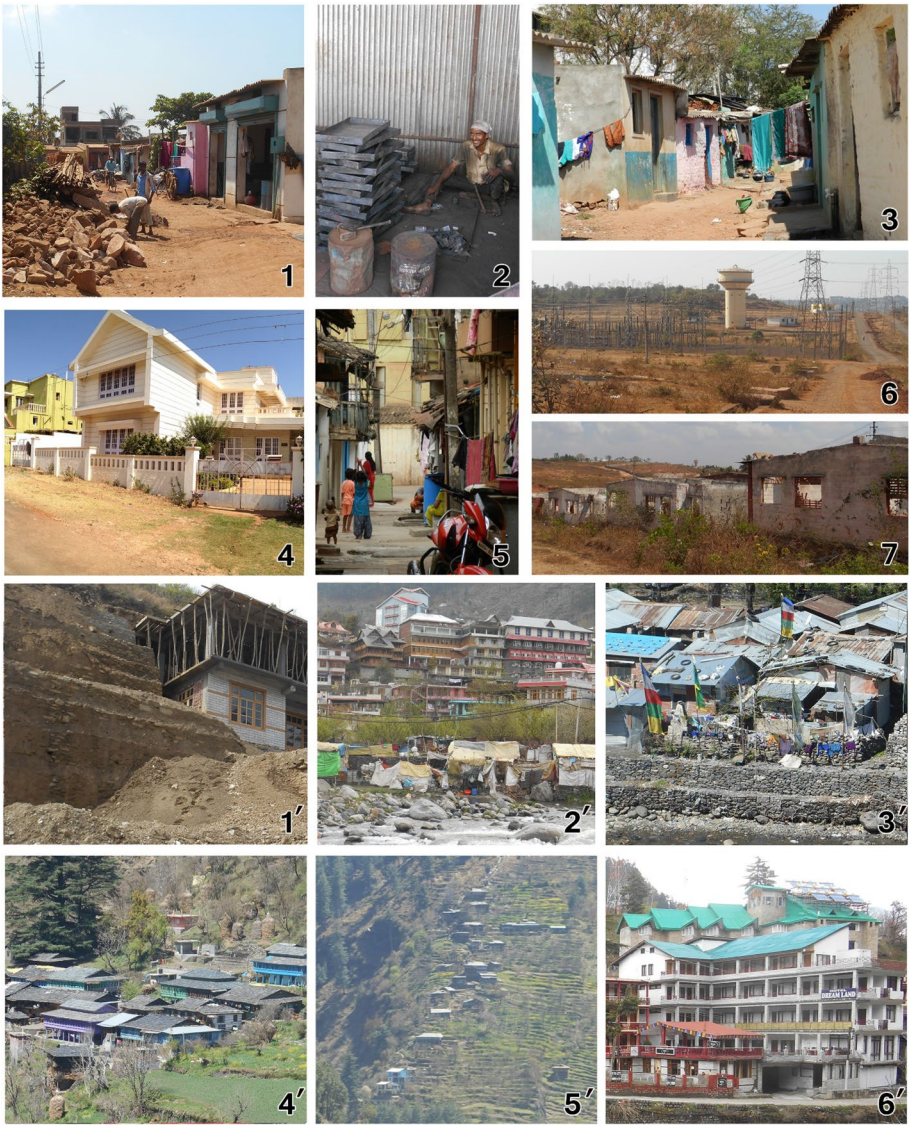

Fig. 7 Hubli-Dharwad and Kullu picture set

pic.3, these areas, composed of self-constructed houses are less vulnerable than the off-grid slums described in the previous section.

The northern part of Hubli is wealthier than the rest of the conurbation. This is reflected by an area covered by large single-family homes (Fig. 7, pic.4) which is growing faster than the rest of the city. Despite the presence of a large number of high-income households, not a single gated community can be found in this district. The dynamism of Hubli-Dharwad and the rise of the middle class are reflected in a rapid growth of urbanization within and along the main corridor linking Hubli and Dharwad. This corridor, focal point of the

current urban growth of the district, hosts several functions (hundreds of retailers and warehouses, administrative headquarters of the conurbation authority, luxury resorts, public and private colleges, etc.). The ongoing development of the residential function of this corridor follows three models: (a) Standardized layouts and houses built by promoters (b) Standardized layouts and houses built by promoters under arrangements with the municipally in order to provide social housing or official staff housings (c) Parcels connected to water and electricity networks that can be purchased and constructed on as desired.

At first glance, the urban growth related to the residential sector appears very impressive. However, the residential areas under construction and the parcels connected or in the process to be connected to water and electricity networks are nearly equivalent in terms of surface area than the current surface area covered by the conurbation. This provides a very strange landscape in which, in some cases, private owners have finished the construction of their parcels and now live within a deserted neighborhood. In such neighborhoods, less than one in ten parcels is inhabited or under construction while the others fail to find a buyer. Sometimes, there is only infrastructure and roads spread over several uninhabited squared kilometers (Fig. 7, pic.6). Paradoxically, these residential areas under development keep spreading while the offer is already far more important than the demand. Worse still, several projects fully or half developed lie abandoned. Figure 7, pic.7 shows for example a layout made of 70 social housing units constructed in 2012 by the Hubli-Dharwad Urban Development Authority and half finished. The housing conditions have worsened by 2.8% in ten years despite the increase of the dwelling offer within the district. This pattern highlights that in this case worsening housing conditions are not necessarily linked to urban densification.

Some districts located in elevated places like in Himachal Pradesh and the eastern parts of India (Meghalaya, Mizoram, etc.) possess a high NCH score (Fig. 2). The last case study, namely the Kullu district, is the heartland of Himachal Pradesh. Located in the Himalayan part of India, the geography of this district is constrained by a major valley crossing the area from north to south. Three small cities are located within the bottom of this valley: Bhuntar, Kullu and Manali. The NCH reaches 61% in this district (well above the 44% Indian average) associated with a strong positive evolution of 11 points in 10 years. According to the Census, this district contains a population of 437,474 inhabitants in 2011 (from which only 9.43% are urban). With a weak urbanization rate and still a primary sector in minority (Census of India 2011) but a high NCH, the preliminary hypothesis is that we can be in presence of a particular eco-system of well-being based on a service economy (namely tourism).

Due to the natural constraints, in some places, the bottom of the valley is too tight thus preventing any construction except the road. In order to build more, slopes are carved out when the valley is too tight (Fig. 6, pic.1′) thus revealing an important in-filling dynamic. The majority of the population within the main valley lives in small and mid-sized buildings within old towns/villages centers or in single-family houses located at the outskirts of these centers. Sometimes, constructions are built within the valley sharp slopes and are half supported by pillars. Several densely populated villages are found between Kullu and Manali on both sides of the River. It is interesting to note that these villages are growing thus revealing dynamism not based only upon the major urban centers (as it was the case in Hubli-Dharwad). Overall, the living conditions in this district are of an outstanding quality, thereby confirming here the indicator results.

Nonetheless, some slum areas can be found. These kinds of poor urban settlements can be divided into two main categories. First, there are some off-grid slums (similar to those discussed in the previous section) composed of migrant workers coming mostly from

Rajasthan, Bihar and Uttar Pradesh. They work in the construction sector, supporting the development of individual properties for locals and tourism-related facilities. These slum areas are directly positioned on the banks of the river thus generating a vertical stratification of the standards of living (Fig. 7, pic.2′). These settlements are only temporary installations not made of concrete materials and thus exposed to flash floods during heavy rain falls. Even if the living conditions are dramatically low in these locations, it is not in contradiction with the NCH results since as compared to the metropolitan profile, these slums contain barely a few percent of the district population. Moreover, as it was the case in Bangalore, these slums are built without any authorization and thus hard to take into account by both our indicator and the Census of India. Second, a handful of Tibetan refugee colonies can be found near the river but not directly on the banks (Fig. 7, pic.3′). The living conditions here are by far better than the migrant workers (connected to electricity/water networks, concrete materials, etc.).

The last kind of settlements are small villages that can be found all over the district beyond both sides of the Kullu valley (Fig. 7, pic.4′), sometimes even located on mountain slopes (Fig. 7, pic.5′). These villages are not connected to any transportation infrastructure and follow a traditional lifestyle with families definitely not concerned by overcrowding issues.

Manali, the biggest settlement in the northern part of the district follows a specific urbanization pattern related to mass tourism.[13] Two different profiles of tourists can be found. The first one is composed of native Indian people coming from all over the country. An unrestrained urbanization mainly constituted of first class hotels and small resorts is growing in order to accommodate the seasonal increasing inflow of the Indian upper-classes (Fig. 7, pic.6′) The second profile is made of tourists coming from all over the world and especially from Europe and North America. Western tourists are more in quest of simplicity and authenticity thus not directly influencing urbanization.

8 Conclusions and implications

The NCH indicator is a good alternative to explore an important dimension of the standard of living gap in India at a macro-scale: the overcrowding in housing conditions. The criteria used to calculate housing conditions are diverse and non-standardized between countries (HDI included) but the number of dwelling units and the household sizes are often inquired within national censuses. It can thus be used as a mean to compare the standards of living of different countries. Since overcrowding is the effect of external socioeconomic constrains on households, whether in urban or rural contexts, results are less influenced by lifestyle choices than the methods using owned amenities and assets to assess societal well-being levels. Another advantage is that all urban landscapes receive equal treatment, thus avoiding the "slum" categorization which can sometimes encompass widely different urban fabrics.

[13] Kullu district has experienced an accelerated development in tourism, agriculture, and hydroelectricity since 1985 (e.g. Gardner and Sinclair 2003). It has been followed by a remarkable social and economic development. For example, in 1971 there were two guesthouses and hotels in Manali against 700 30 years later (Pandey 1998). Today, the northern part of the district is totally dedicated to mass tourism with a number of guesthouses and hotels that keeps increasing.

Some districts may outperform or remain underneath the national average. But, the real benefit of this research performed at the district scale lies in the emergence of sub-spaces at a broader scale. The spatial structures detected through the analysis of this indicator are in most of the occurrences coherent with the regional boundaries of the Indian Union but some states are nonetheless showing strong internal disparities (Rajasthan, Gujarat, etc.). Two major strips of poor living conditions have been highlighted (Delhi to Bay of Bengal, Delhi to the southern part of the Deccan Plateau) whereas the coastal part of the Kerala and some cluster of districts located in high grounds are characterized by good scores. In terms of overcrowding, megacities are often self-sustained systems, disconnected from theirs regional environments. The perseverance of urban landscapes with poor living conditions (both economically dynamic and off-grid housings) right in the middle of India's metropolitan areas can be preliminary explanations of the poor housing conditions score in these districts (especially in water-locked Mumbai: 29% NCH, with an evolution of +3.4% between 2001 and 2011). Finally, the cross-analyze with housing conditions, amenities and household assets revealed where overcrowding is a real issue that should be addressed under the 'National Urban Housing and Habitat Policy' (discussed in Sect. 3) as opposed to some sub-spaces where it can be the outcome of cultural preferences and history.

Overall, overcrowding is more common among the scheduled castes thus showing the long-lasting effects of the old caste system in India. The 2001–2011 trajectories of some other sub-spaces are also typical of areas where socioeconomic development is particularly intense and recent (coastal part of Tamil Nadu, Gujarat, etc.). At the opposite, the many detected clusters of decreasing living conditions (eastern belt, Rajasthan, southern part of the Deccan Plateau) are not supporting a theoretical convergence between poor and affluent regions. Thus, despite the eye-catching performance of the Indian economy (Aiyar 2011), this country is likely to be headed toward increasing socio-economic disparities. Low income households may be financially better off in large cities but the gap in term of housing conditions between the whole population and the scheduled castes remains stronger in these spaces. With the perseverance of these inequalities, increasing tensions along social and regional dividing lines are unfortunately also a plausible and feared scenario and will add to the traditional community divides. Fieldwork showed that in metropolitan environments, gated communities and slums can cohabitate in the same (or in close by) neighborhoods. The advantage of the NCH indicator is that, off-grid housing or not, economic dynamism or not, all urban landscapes receive equal treatment. Since the Census of India is also collected at finer scales, it should be possible to detect these communities/cluster areas by calculating the indicator at the ward level.

Indeed, the choice of the district as scale of analysis results in a loss of information in intra-district variability. It is also from this perspective that fieldwork has been performed in varied contexts. Even if the fieldwork results of a few case studies cannot be generalized to the whole of India, it should be pointed out that the fieldwork findings are very consistent as regards to the indicator results. The scores of megacities like Mumbai and Bangalore are within the Indian average but, as expected, strong disparities within the housing conditions are found. The NCH results are far more relevant in districts lacking of megacities since less extremes inequalities are found within these case studies (no gated communities, few off-grid slums, etc.). Overall, NCH indicator seems closer to the living conditions experienced by the population than the usual macroeconomic indicators especially within less urbanized districts. However, in heavily rural contexts, cultural preferences and/or history can reveal different scores of overcrowding despites similar living conditions (difference between Eastern and Western Deccan). In Hubli-Dharwad, despites fewer extremes disparities than in megacities and physical capacities to absorb the current urban growth

the NCH decreased in 10 years. Fieldwork revealed that this score has to be put into perspective with regards to impressive economic development and real-estate bubble. Local contexts or even preferences are of utmost importance, as Dharavi showed, new housing units built by the government are indeed less overcrowded but at the same time not adapted to the daily routine of this neighborhood.

To conclude, as discussed for the Kullu district, a high NCH does not mean a situation without dramatically low housing conditions for some minorities, a situation clearly linked to seasonal working migrations. Kullu district is the perfect example of why we should not attempt to read India's diversity based on a dual model opposing wealth, urbanization, access to infrastructure to poverty and rurality. The housing conditions are indeed traditionally high and still increasing despite weak urbanization processes, an ongoing shift to the service sector and practically non-existent heavy infrastructure of transportation.

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Compliance with ethical standards

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