Working paper

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Six key trends in housing conditions in Rwanda from 2011 to 2017

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Summary

Rwandans are living in better housing conditions than they were at the start of the decade. As compared to 2011, in 2017 Rwandan households lived in houses with better roofs, floors and walls. Whilst a great deal of progress is yet to be made, our analysis shows that these households are living in better habitats; rural areas saw the growth of imidugudu (grouped rural settlements) at the expense of rural areas and urban areas witnessed the slow growth of modern planned settlements at the expense of unplanned settlements. Urban life is also changing – more households are taking advantage of the flexibility of renting to access urban job opportunities; there has also been significant progress on provision of electricity and internet. People are living closer together in urban areas in a process of densification which is generally to be welcomed, although one measure of household overcrowding is increasing in urban areas. Progress has been positive overall, a testament to the success of a range of Government policies on housing, Imidugudu, energy and information technology, as well as infrastructure investments and the broader pro-development policy framework. However, it is concerning that progress is slow on water provision, sanitation and waste.

Whilst the much-quoted national poverty statistics showed that poverty reduced from 2011 to 2014 but that progress slowed between 2014 and 2017, the trends presented in this paper relating to household quality of life tended to show clear improvement throughout both time periods.

In this policy note we describe six key trends in housing and services relating to housing, affecting Rwanda's households during the period 2011 to 2017, based on the 2018 release of the fifth Integrated Housing Living Conditions Survey (EICV 5). We have focused on housing policy issues substantively elsewhere (for example, Bower & Murray 2019); here the goal is to take advantage of the release of the new data set to draw out the following key trends:

1. **Housing construction materials are improving steadily**
2. **More households are renting, especially urban households**
3. **Imidugudu (grouped rural settlements) have expanded significantly, largely at the expense of isolated rural housing; habitats of urban living have improved in quality**
4. **Urban houses are densifying, and overcrowding is increasing or decreasing depending on the measure used; it is similar in urban and rural areas but diverging**
5. **Coverage of urban waste services has improved but progress has been slow on water and sanitation**
6. **There has been significant progress in access to home energy use and internet**

EICV 5 was collected in 2016/2017 permits a six-year comparison with similar data from EICV 3 (2010/2011), from EICV 4 (2013/2014). The EICV 5 Thematic Report on Utilities and Amenities gives a thorough treatment of similar content, but we differentiate from this in two important ways. First, we aim to extract and present clear messages relevant to the housing sector in a more digestible manner using graphs, instead of complex tables which are necessary for official statistical reporting but from which relevant narratives can be difficult to extract. Second, we compare almost all statistics across all three surveys conducted in 2011, 2014 and 2017, whereas the Thematic Report compares just the latter two.

1. Housing construction materials are improving

Wall materials in both rural and urban areas are improving steadily. Figure 1 below shows that walls built from higher quality materials such as oven-fired bricks, stones or bricks containing cement, increased from 27% to 41% of households nationally. The figure for urban areas increased from 63% to 78% of urban houses.

According to Figure 2, which covers wall materials in more detail, since 2011, usage of mud bricks covered with cement has increased mainly at the expense of tree trucks with mud, and is the dominant building material in urban areas. Use of oven-fired bricks has increased little in urban areas. Use of mud bricks remained roughly constant at around 40% in rural areas and decreased from 20% to 17% in urban areas. Rural households are more likely to use mud bricks and urban households are significantly more likely to use mud bricks covered with cement.

Figure 1: Overview of wall materials in Rwanda, rural areas, urban areas, and Kigali

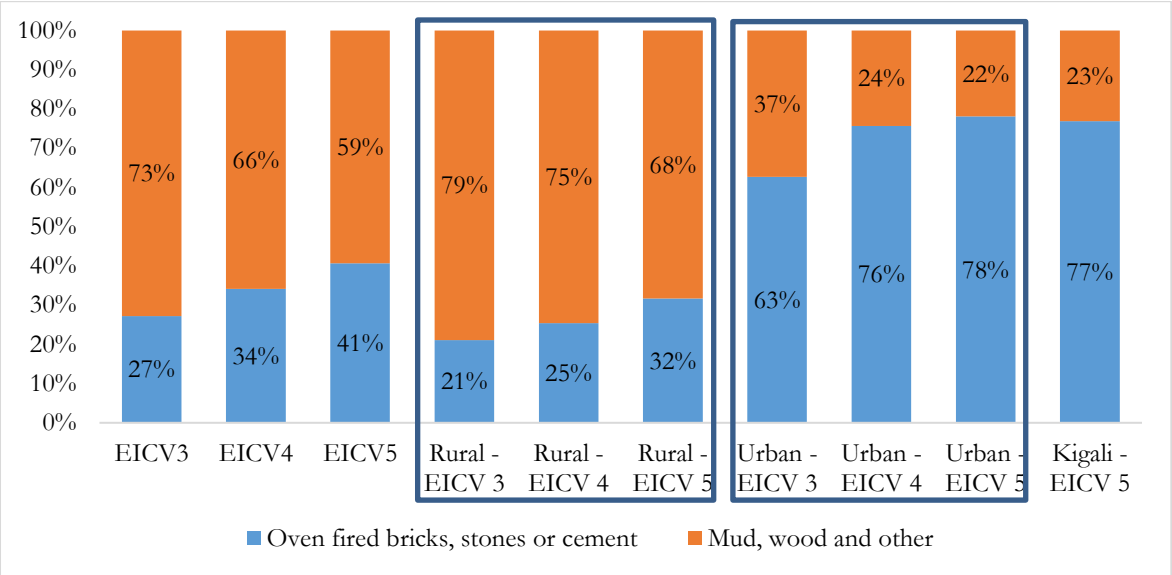
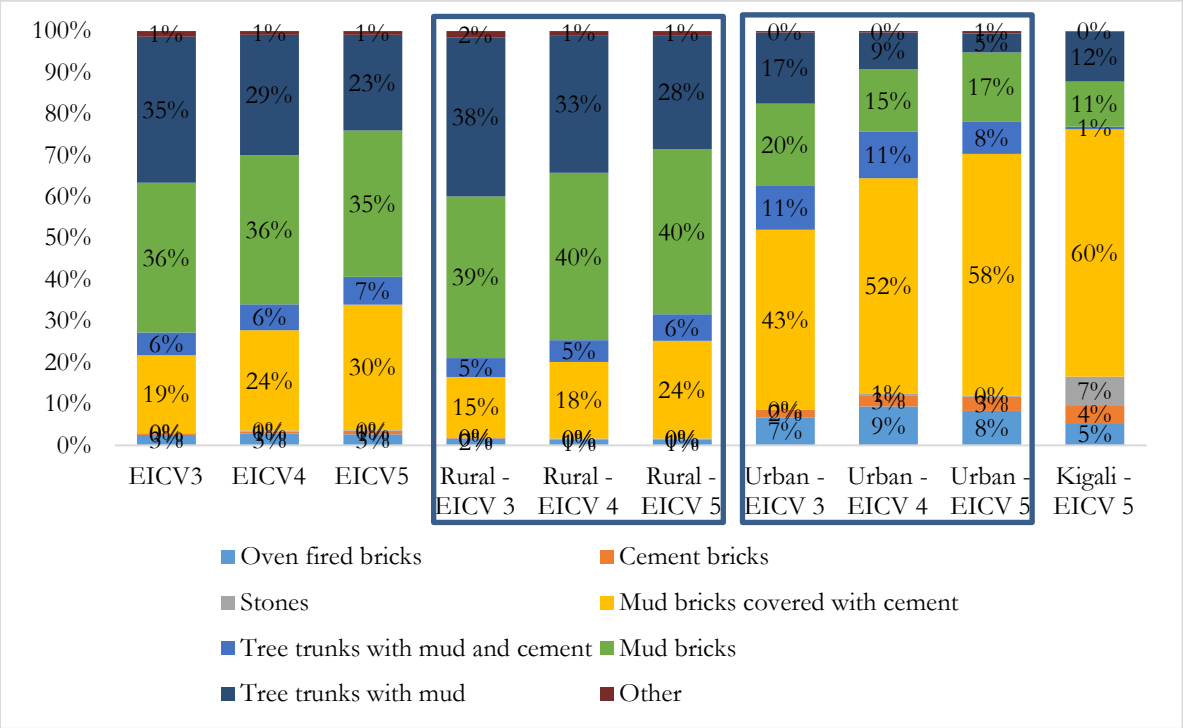


Figure 2: Detail - wall materials in Rwanda, rural areas, urban areas, and Kigali



Like urban households, richer households tend to substitute mud bricks for mud bricks with cement, according to the breakdown of wall materials by national-level income quintile in Figure 3. Only in the top 20% of households do oven-fired bricks make any significant appearance; this wall material type is used for 80% of households in the top quintile.

Figure 3: Wall materials, nationally, by consumption quintile – EICV 5

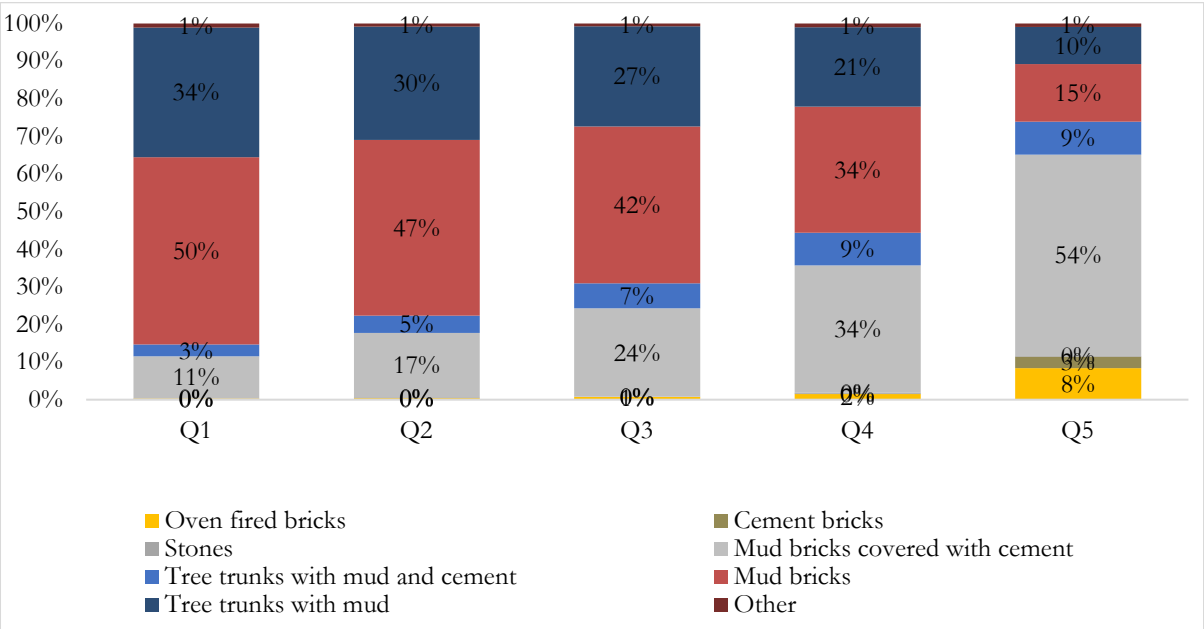


Figure 4: Roofing materials in Rwanda, rural areas, urban areas and Kigali

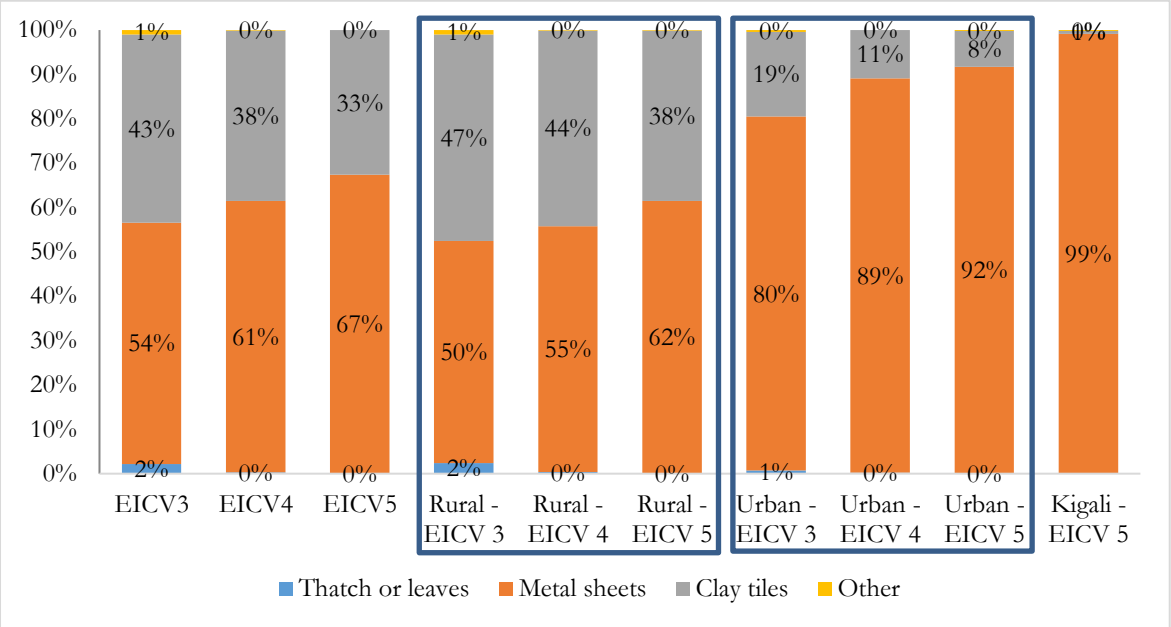
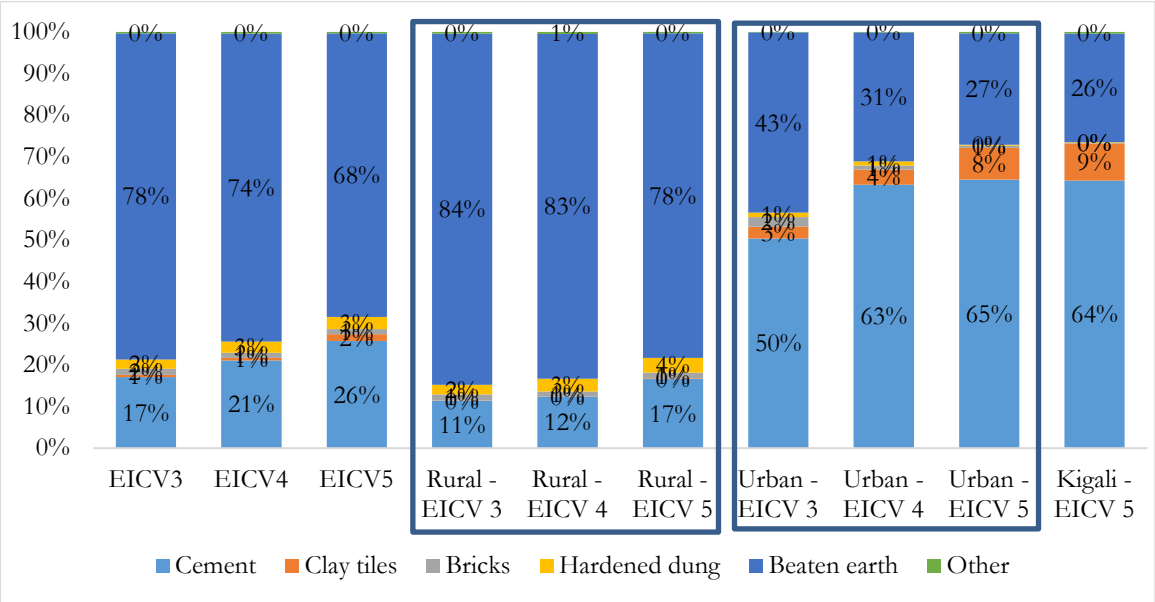


Figure 4 illustrates that in urban areas, metal sheets dominate at 92% in EICV 5 up from 80% six years earlier, and are used for 99% of households in 2017, whereas, clay tiles make up 38% of roofs in rural Rwanda up from around half in 2011.

Figure 5: Floor materials in Rwanda, rural areas, urban areas and Kigali



While beaten earth takes up a large but decreasing portion of rural household floors (78% in 2017), the material makes up just 27% in urban areas, down from 43% in 2011. In 2017 cement dominates urban areas at 65%. Nationally, the main floor material is increasingly cement (rising from 17% to 26%) instead of beaten earth (falling slightly from 78% to 68%).

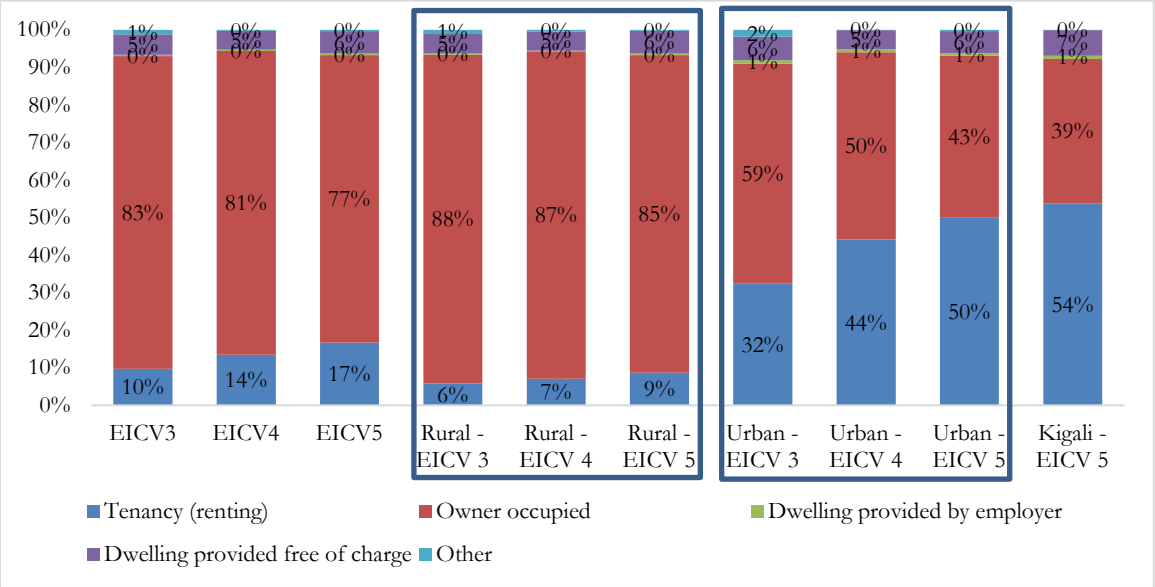
These improvements in housing conditions are laudable and have important health and development consequences; Snyman et al (2015) found that houses with mud walls, thatched roofs and mud floors

increase malaria incidence, and Cattaneo et al. (2008) found that replacing dirt floors with concrete "significantly improves the health of young children", "leads to a 78 percent reduction in parasitic infestations, a 49 percent reduction in diarrhea, an 81 percent reduction in anemia and a 36 to 96 percent improvement in cognitive development". As noted in Buckley & Bower (2019) the Government might consider directing any social housing expenditure towards subsidising hard floors.

2. More households are renting, especially urban households

Renting is on the rise in urban areas and to a lesser extent in rural areas. As Figure 6 shows, in 2011, 10% of households were renting; this role by 7% by 2017. Owner-occupation fell from 83% to 77% in the same period. Renting in urban areas rose a full 18% to 50% of households, and rose from 6% to just 9% in rural areas. In Kigali Province, 54% of households rent, compared to only 10% outside of Kigali. Moreover, the proportion of households that are tenants is as high as 63% for urban Kigali.

Figure 6: Occupancy status in Rwanda, rural areas, urban areas and Kigali



The rent share of consumption is 14% in urban areas, and 8% in rural areas for 2017. Kigali renters pay 15% compared to 8% outside Kigali.

3. Imidugudu have expanded significantly, largely at the expense of isolated rural housing; urban habitats have improved in quality

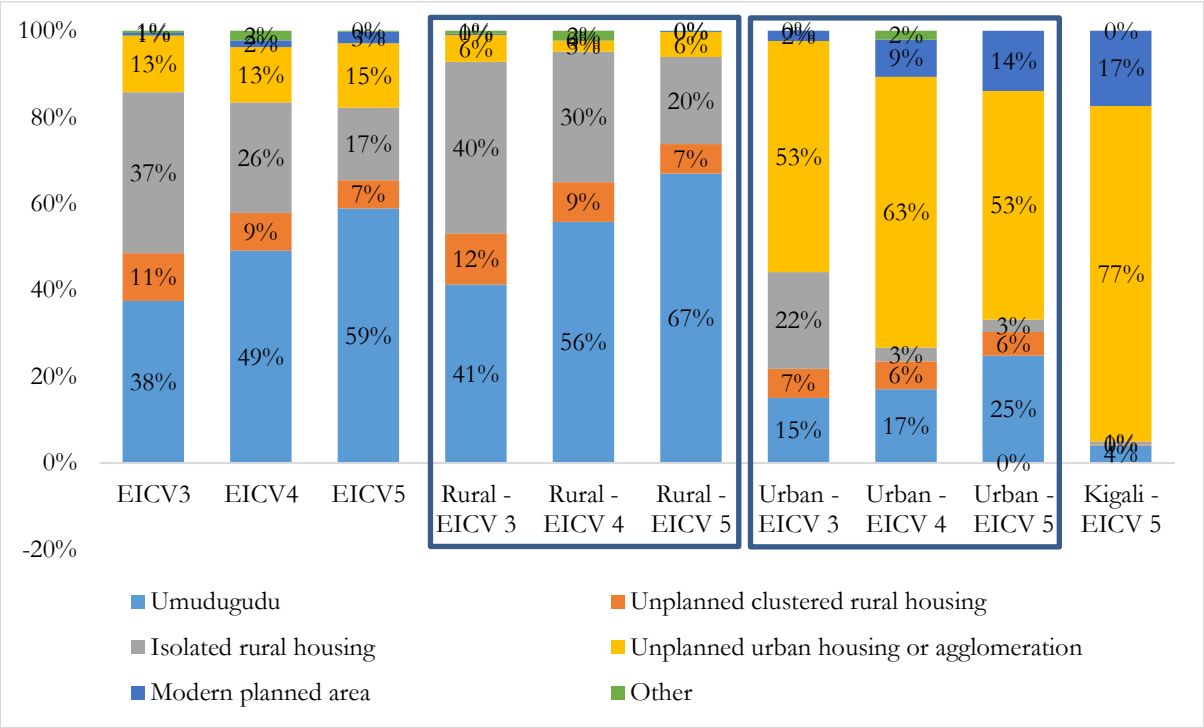
Since 1996, Rwanda has pursued a policy of grouped villages called Imidugudu (the plural of Umudugudu), to "encourage the development of well-planned rural centers, and to improve the living conditions by availing social and economic services to the residents, along with the efficient use of land" (National Housing Policy 2015). According to the Future Drivers of Growth study, Imidugudu which have had some positive effects on land use efficiency and quality of life, but require large investments in many highly-scattered rural settlements; these investments may have a higher economic impact if they are focused on Imidugudu in better connected locations and on urban-rural connectivity (Government of Rwanda-World Bank 2018). Interestingly, whilst there has been an apparent reduction in prominence of the Imidugudu policy[1], its influence has strongly continued in its second decade: Figure 7 shows that during the period

[1] The policy appears prominently in pre-2010 human settlement policies and Ministerial order n° 001/07.05 of May 19, 2009, but receives only a brief mention in the National Housing Policy or other recent policy documents post 2010

from 2011 to 2017, the number of households in rural areas classified as being situated in Imidugudu, rose dramatically from 38% to 61% nationally, and from 41% to 67% in rural areas. They even rose from 15% to 25% in areas classified as urban.

In Kigali, few households are in Imidugudu (4%), a figure which has decreased since 2011. The national increase in Imidugudu holds across all quintiles (by consumption), although higher quintiles (with higher consumption) are less likely to live in Imidugudu.

Figure 7: Type of habitat in Rwanda, rural areas, urban areas and Kigali



Simultaneously, isolated rural housing has more than halved from 37% of overall housing to 17% nationally and from 40% to 20% rurally, a similar percentage point difference to the increase in Imidugudu. In areas classified urban, isolated rural housing has almost disappeared (from 22% to 3%). Unplanned urban housing or agglomeration appear to be similar categories, but this is unclear; therefore it is hard to interpret the statistics, which appear to say that in urban areas this category increased from 53% in 2011 up to 63% in 2014, largely at the expense of isolated rural housing, and then back down to 53% in 2017; the 10% gap between 2014 and 2017 was taken up with an increase in modern planned areas and Imidigudu. This trend would be consistent with a significant increase in the quality of urban habitat types over this period. However, Kigali remains dominated by unplanned urban housing or agglomeration, with 77% of houses in this category. Households in urban areas living in modern planned areas have increased from 2% to 14% during the six years to 2017.

4. Urban houses are densifying, and overcrowding is increasing or decreasing depending on the measure used; it is similar in urban and rural areas but diverging

In this section we distinguish between densification, which is a pillar of the National Urbanisation Policy, and overcrowding, which has negative consequences for health and income. We interpret increases in measures such as the average floor space per adult equivalent, as densification, but we sourced accepted measures of overcrowding in the literature that could be found in EICV data. These include the proportion of households with more than two adult equivalents per bedroom and more than three adult equivalents per bedroom.

From 2011 to 2017, a measure of densification, floor space per adult equivalent, decreased slightly in urban areas but particularly in Kigali, to around 14 square meters. Interestingly, it is lower in rural areas but increased to just over 12 square metres as shown in an overall increase nationally, representing densification in urban areas and the reverse in rural areas.

Figure 8. This represents an urban-rural convergence in floor space per adult equivalent and an overall increase nationally, representing densification in urban areas and the reverse in rural areas.

Figure 8: Floor space per adult equivalent (square metres), in Rwanda, urban areas, rural areas and Kigali

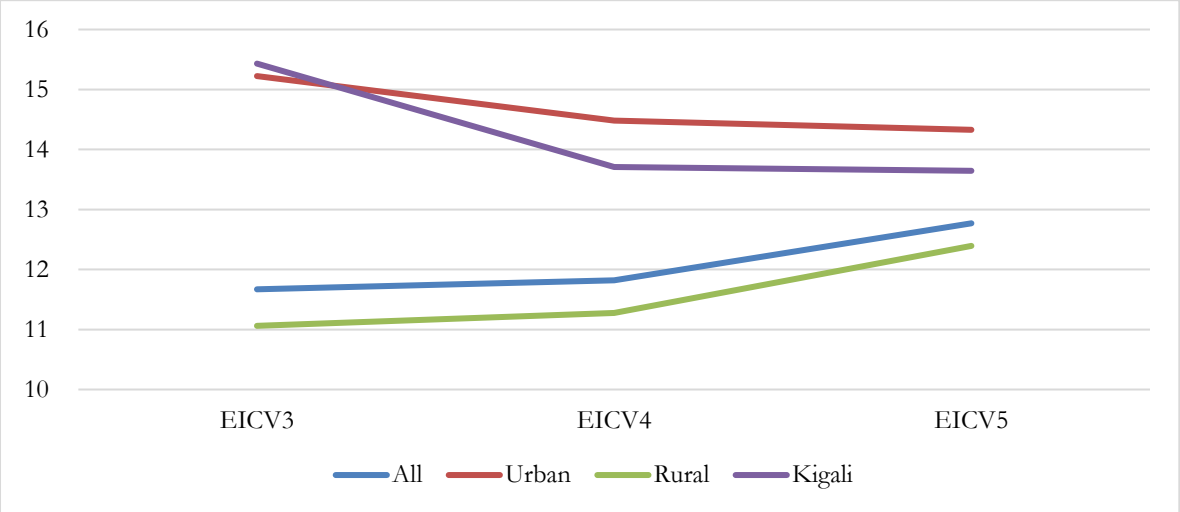
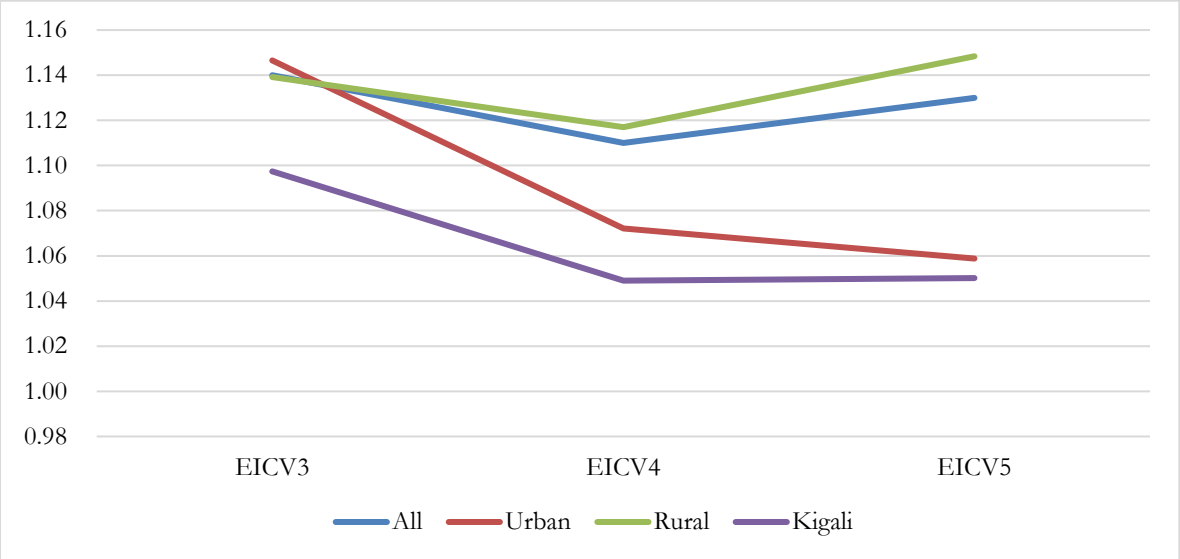


Figure 9: Rooms per adult equivalent, for Rwanda, urban areas, rural areas and Kigali



Another measure of densification, the number of rooms per adult equivalent, has also decreased in urban areas and especially in Kigali, as Figure 9 shows, from around 1.14 in 2011 to 1.06 in 2017. In rural areas this figure first decreased then increased in 2017 back to around 1.15. As for Figure 8, this is roughly consistent with densification in urban areas and the opposite, to a smaller extent, in rural areas.

In spite of a larger number of rooms per adult equivalent in rural areas, rural households have a lower number of *bedrooms* per adult equivalent, which fell slightly to around 0.63 in 2017, as Figure 10 illustrates. The figures for urban households and for Kigali, which are slightly higher, dropped between 2011 and 2014, rising again in 2017 but at a higher rate for Kigali.

Figure 10: Bedrooms per adult equivalent, in Rwanda, urban areas, rural areas and Kigali

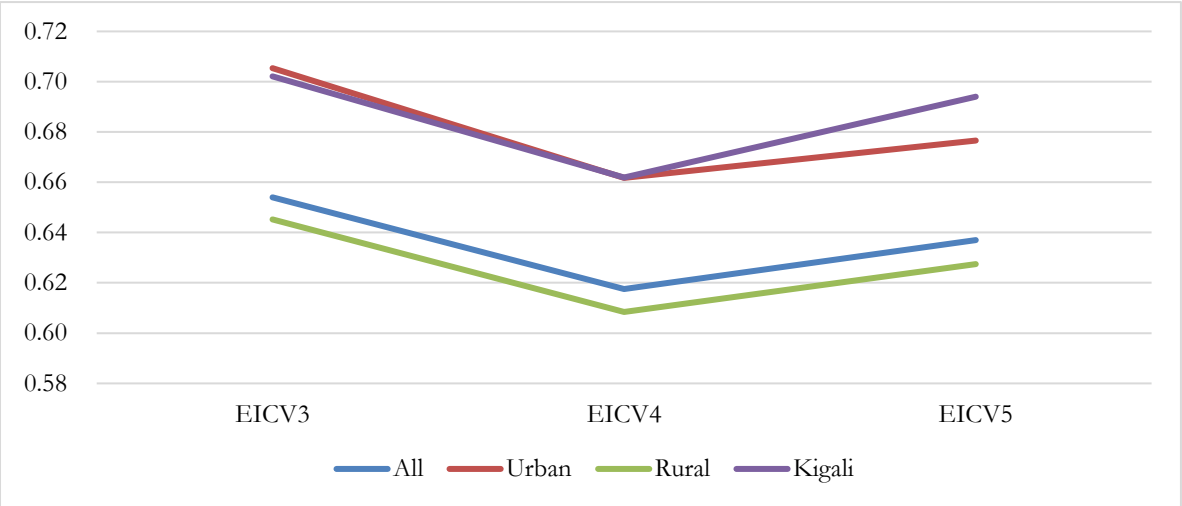


Figure 11: Percentage of households with more than 3 adult equivalents per bedroom, in Rwanda, urban areas, rural areas and Kigali

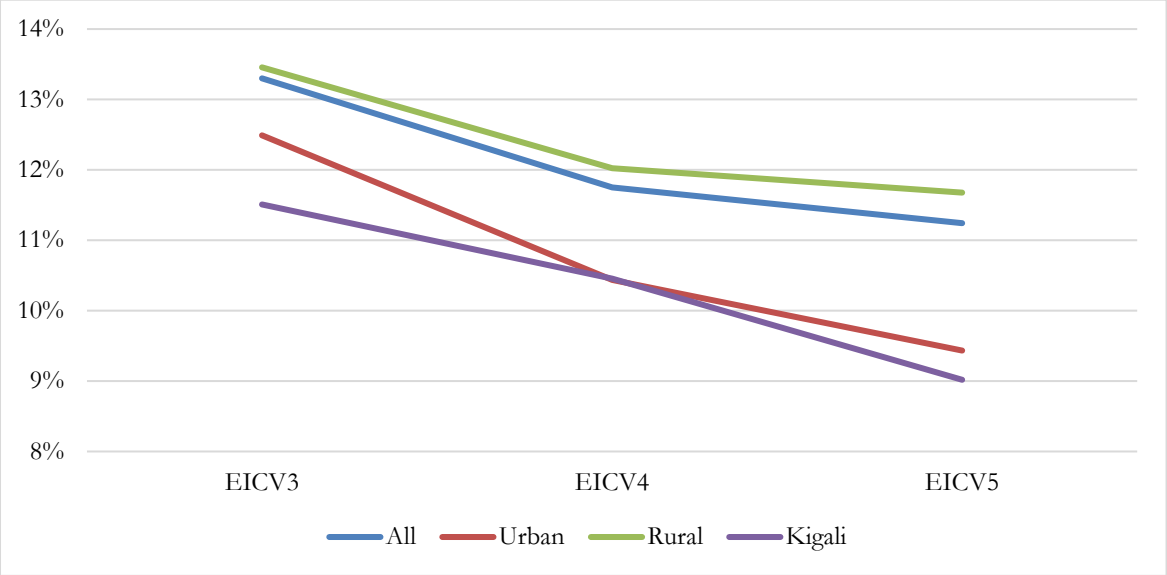
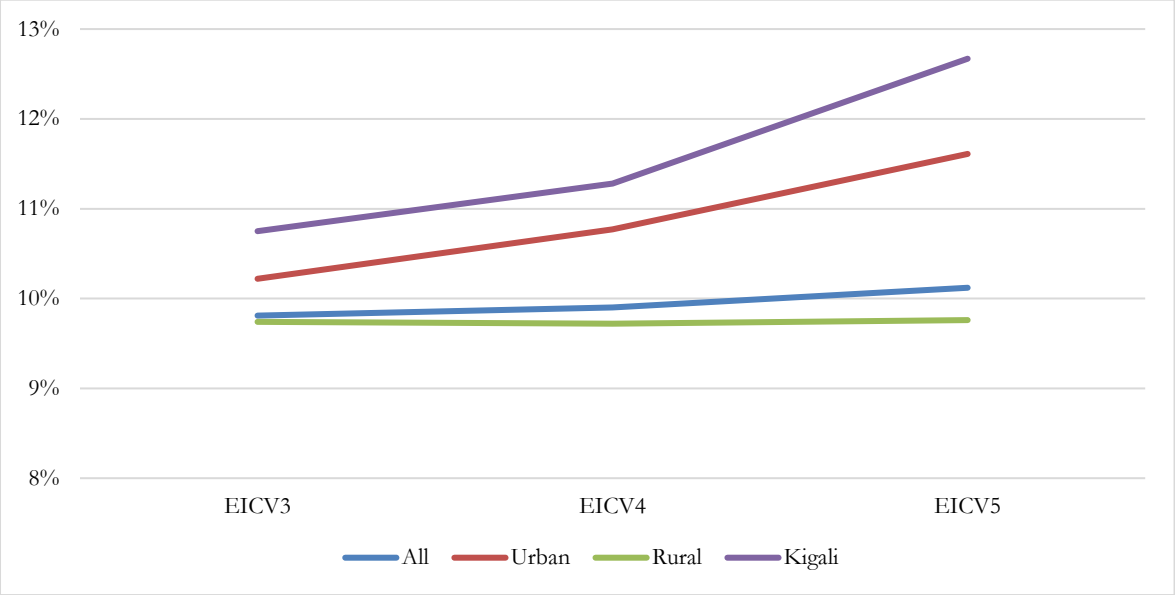


Figure 11 presents a convincing measure of critical overcrowding which is the percentage of households that have more than three adult equivalents per bedroom (see Gray 2001 for a literature review of overcrowding measures, of which this one is at the higher end of standard measures). This measure of overcrowding is a little worse in rural areas than urban areas, but fell from just over 13% in 2011 to just under 12% in 2017. Overcrowding in urban areas and Kigali fell to just under 10%. Perhaps surprisingly, according to this measure Kigali is less overcrowded than rural areas or urban areas in general.

A final overcrowding measure we examine is the percentage of households that have more than two adult equivalents per room. Gray (2001) state that the standard of two people per room was a measure applied in the US in the 1940s, but the standard has become more stringent with both US and Europe now using a standard of one person per room as their household sizes went down and income levels went up. Here we use two adult equivalents per room. Figure 12 shows that across the 2011-2017 period this figure was stable at just below 10% in rural areas, but is rising in urban areas particularly Kigali which stood at just below 13% in 2017.

Figure 12: Percentage of households with more than 2 adult equivalents per room, in Rwanda, urban areas, rural areas and Kigali



Single-house dwellings with one household* make up 89% of dwellings nationally in 2017, and only 5% of households in a house with multiple households share any rooms with other households. In urban areas, 20% of households live in a house occupied by multiple households (of which 2% share rooms with other households), and 16% are a group of enclosed dwellings. Twenty-six percent of renters live in a house occupied by multiple households.

5. Coverage of urban waste services has improved but progress has been slow on water and sanitation

As is well documented, progress on sanitation, water and waste services has profound health and development consequences and can prevent stunting. Although urban areas saw progress between 2011 and 2014, national and rural progress has been slow from 2011 to 2017 in terms of coverage. Two fifths of Rwandan households use protected springs or wells, around a quarter of Rwandan households use a public standpipe as their main source of drinking water, while just under three tenths use unprotected sources or the surface water of rivers or lakes. The percentage of households that get water piped into their yard or dwelling rose from 6% to 9% in 2017.

Provision of higher quality water sources – water piped into the dwelling or yard, or use of a public standpipe – improved dramatically in urban areas between 2011 and 2014, from 61% coverage to 76%, but remained at the same level in 2017. The National Water Supply Policy (2016) contains ambitious targets of 100% water supply coverage in both rural and urban areas by 2018, in line with EDPRS 2, although the targets were created based on higher figures of water supply coverage from the Census, which do not take distance into account, unlike later EICV data.

* *The household, defined as a group of persons who make common provision of food, shelter and other essentials for living. UN Economic & Social Affairs*

Figure 13: Main water source for households in Rwanda, rural areas, urban areas and Kigali

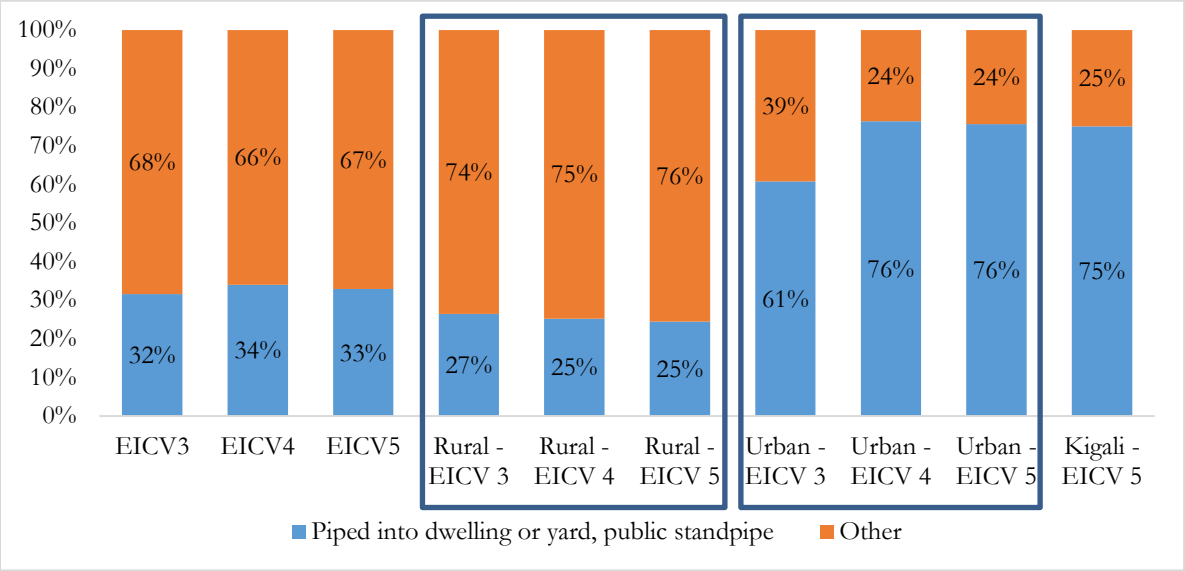
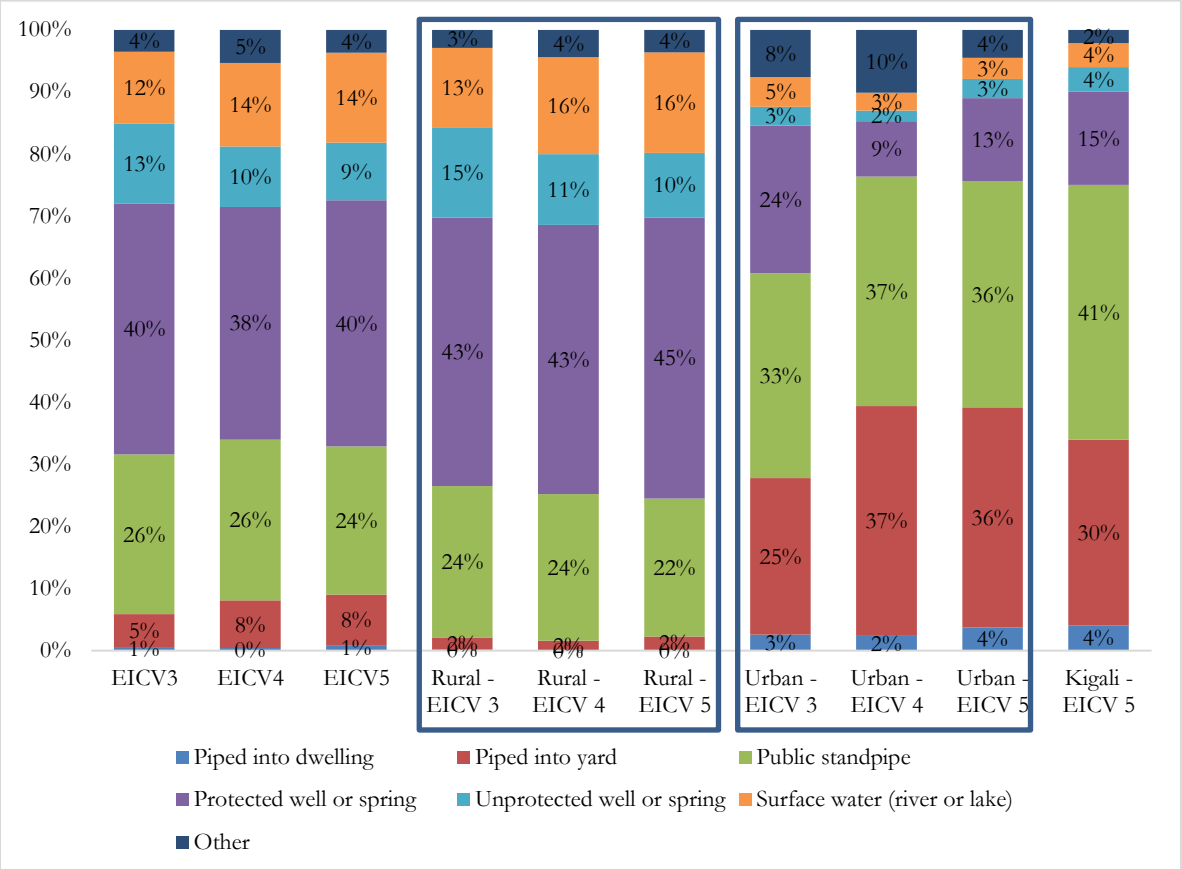


Figure 14: Main water source - detail, for households in Rwanda, rural areas, urban areas and Kigali



As Figure 13 shows, the urban increase was counterbalanced by a slight rural decrease from 27% to 25%; the net result nationally was that provision of higher quality sources changed little, from 32% in 2011 to 33% in 2017. Figure 14 shows water source in more detail, revealing that the increase in urban quality largely came at the expense of protected wells or springs. There is also a limited but troubling increase in rural households taking their water from surface water in lakes or rivers, from 13% in 2011 to 16% in 2017.

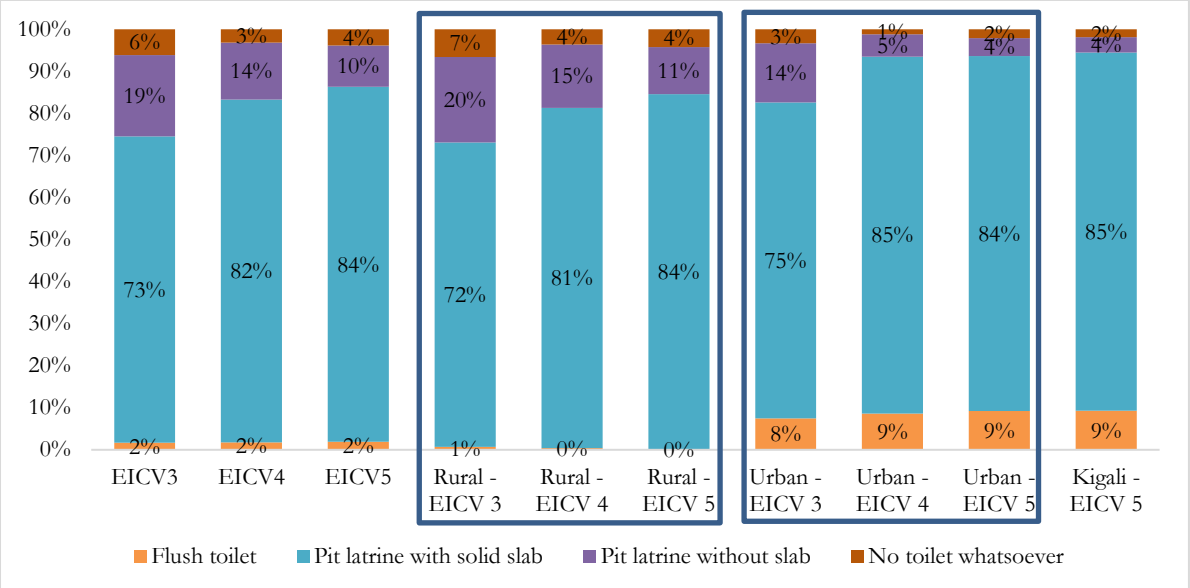
The mean distance between household dwellings and water sources (excluding those that have water piped to their dwelling or yard) is quite high, at 787 metres in 2017. This is down from 844 metres in 2014, but up from 666 metres in 2011. Some households do not use their nearest drinking water source - 18% in 2014, down to 16% in 2017.

In Kigali, 34% of the population have water piped into their yard/dwelling, while 41% use public standpipes and a further 13% use protected springs – an improvement from 2011 figures (37%, 31.3%, and 10%).

Figure 15 shows that Rwandan households are increasingly using pit latrines with solid slab, with 73% in 2011 rising to 84% in 2017, and the trends are roughly the same in urban and rural areas. This increase largely comes at the expense of pit latrines without slabs implying that households are simply adding slabs. The percentage of households without a toilet has also decreased, from 6% to 4%; it is slightly higher in rural areas than urban areas. Flush toilets are still relatively rare, making up 2% of household toilets, 9% of urban and Kigali household toilets, and 7% of toilets for households in the richest quintile nationally.

The National Sanitation Policy (2016) cites the 2014 figures for improved sanitation, defined as the percentage of households accessing flush toilets or pit latrines with a slab; these are 83% nationally, 81% in rural areas and 94% in urban areas. Given the availability of the 2017 data, we can now update these figures which rose to 86% nationally and to 84% in rural areas, but fell slightly to about 93% in urban areas.

Figure 15: Type of toilet, for households in Rwanda, rural areas, urban areas and Kigali

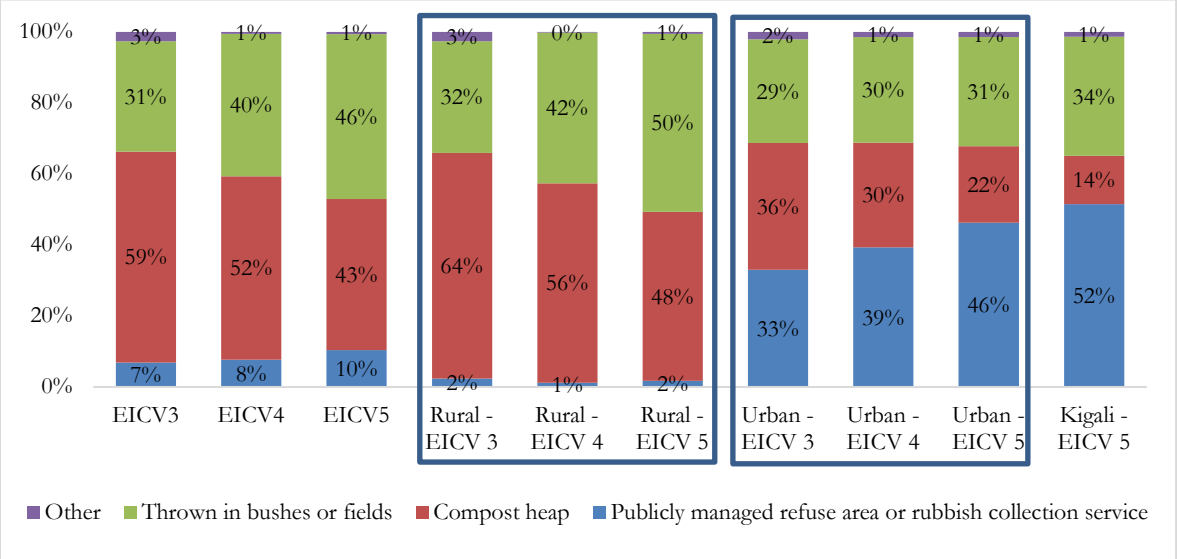


Toilet sharing has remained the same between 2014 and 2017; in urban areas around half of households share, and around 55% of households share in Kigali; the share drops to a fifth in rural areas.

Solid waste management is recognised as a major challenge for Rwanda which is improving slowly from a low base nationally, with just 7% of households receiving publicly managed refuse area or collection service in 2011 rising to 10% six years later. According to the National Sanitation Policy (2016), which covers solid waste management as a sub-sector of sanitation, solid waste management has been decentralized to municipalities and districts, but is not yet supported by a national task force. In spite of this, urban waste collection has improved, with households benefiting from a publicly managed refuse area or rubbish collection services rising from 33% to 46% between 2011 and 2017. The figure stood at 52% for Kigali in

2017 which faces well-known challenges with respect to converting a dump site into a well-managed land fill (IGC-Jerry Can 2019). Whilst there has been a steep rise in rural households throwing waste in bushes or fields compared to composting it, most rural waste is organic and it is thus unclear whether this is a harmful trend.

Figure 16: Mode of waste disposal for households in Rwanda, rural areas, urban areas and Kigali



Progress on water, sanitation and waste management are important for

6. There has been significant progress in access to home energy use and internet

By 2024, Rwanda's Energy Sector Strategic Plan targets 52% of households to access electricity on-grid and 48% of households to access it off-grid, for instance through solar home systems. The data on electricity use in this section are on the main source of energy for home lighting, which is not identical to energy provision but close enough to be informative. The national share of households' main source of energy for home lighting from largely government electricity distributors more than doubled from 11% to 27% from 2011 to 2017; the 2017 figure is not far from the 2018/2019 target of 34.5% in the Energy Sector Strategic Plan. Rurally this share rose from 5% to 16%; in urban areas the share, which is far higher, increased from 46% to 76%. Rwandans are increasingly using batteries, torches or phones – the proportion rose from 29% to 50% - of which rural areas witnessed a near-doubling from 32% to 60%. This mainly displaced other non-electric sources such as lanterns, which fell from 63% to just 16% as shown in Figure 17. Solar energy made an entrance in rural areas, growing from zero up to 9% in 2017, with some way to go to meet the 2018 target in the Energy Sector Strategic Plan of 17% off-grid access.

Figure 17: Main source of home lighting for households in Rwanda, rural areas, urban areas and Kigali

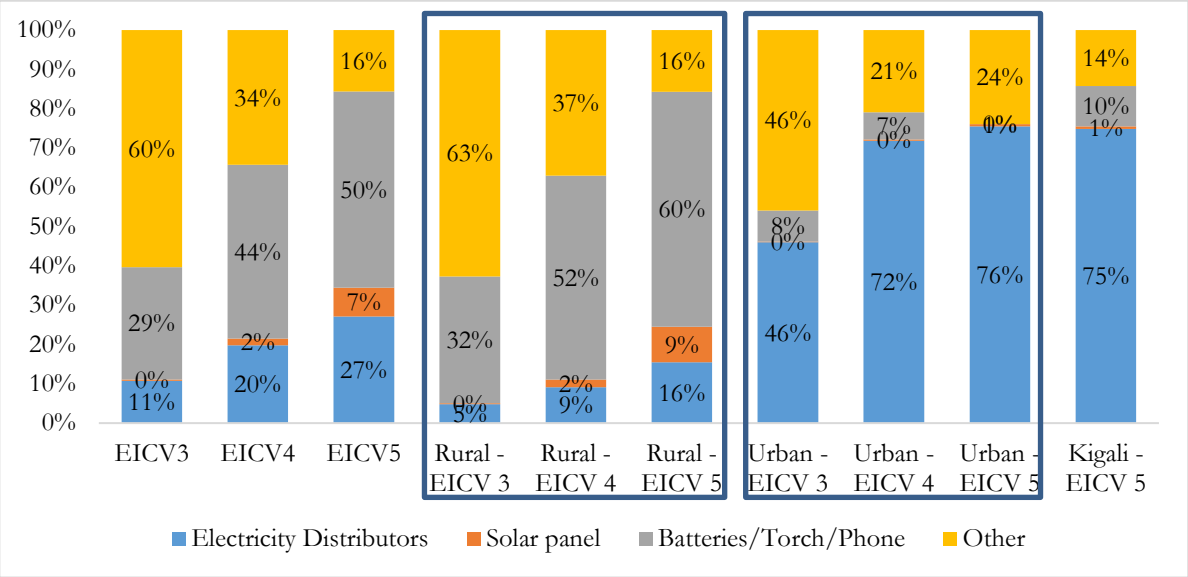


Figure 18: Main source of cooking fuel for households in Rwanda, rural areas, urban areas and Kigali

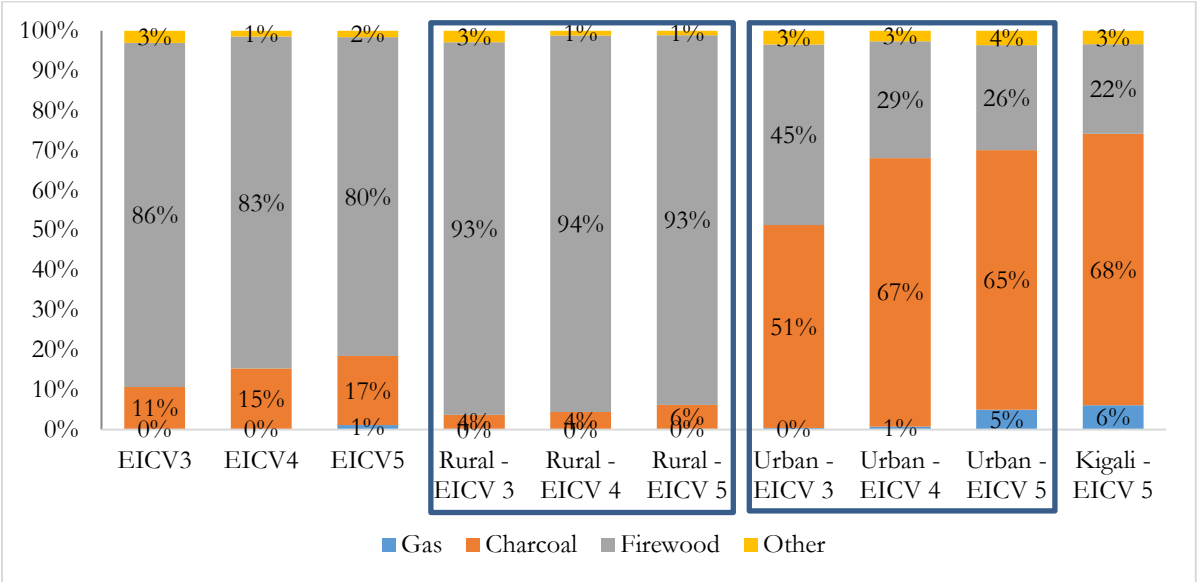
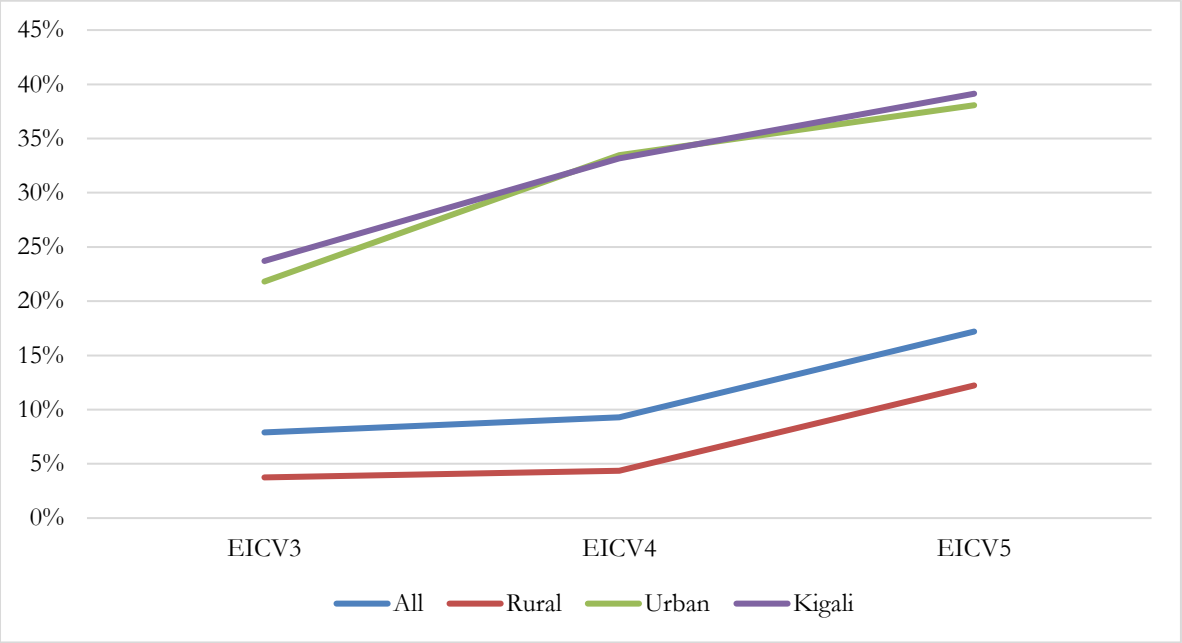


Figure 18 shows that whereas charcoal has increased from 11% to 17% from 2011 to 2017, four fifths of households still use firewood nationally and 93% rurally in 2017. In urban areas charcoal use has increased from 51% to 65% and firewood use has dropped from 45% to 26%. Gas is making an appearance in urban areas, growing to 5% in 2017, largely fuelled by its use in Kigali at 6%. The top income quintile is more likely to use charcoal than the poorest quintile (47% vs 1%); and less likely to use firewood as their main source (45% vs 97%).

Access to internet doubled nationally from 8% to 17% over the six-year period. Rural access tripled from a low point of 4% to 12%, and urban access rose from 22% to 38%; figures for Kigali were similar to overall urban figures.

Figure 19: Percent of households with access to internet in Rwanda, rural areas, urban areas and Kigali



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