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REDEFINING URBAN-RURAL BOUNDARIES FROM THE DIGITAL DISPARITY PERSPECTIVE

**Zakaria Alcheikh Mahmoud¹, Nikmatul Adha Nordin², Melasutra Binti Md Dali³,
Yong Adilah SH⁴, Taiseer Mustafa Rawashdeh⁵, Sara Alcheikh Mahmoud⁶**

^{1,2}Department of Urban and Regional Planning, Faculty of Built Environment

^{3,4}Centre for Sustainable Planning and Real Estate

⁵Department of Civil Engineering, Faculty of Engineering

UNIVERSITI MALAYA, MALAYSIA

⁶Department of Architectural Engineering, Faculty of Engineering

ISRA UNIVERSITY, AMMAN, JORDAN

Abstract

There is no international consensus on a comprehensive criterion to classify human settlements into urban and rural settlements. Different national criteria are used for delineating the borders between the two types of settlements. The main components of the criteria are population size, population density, population economic activity, administrative and legal and services and facilities. Whether all these criteria have been used or some of them, an outright socio-cultural and economic distinction between the two categories of settlements have developed over years around the world. The widely used virtual space during the pandemic provided people with access to facilities and services and enabled them to work for places that usually require their physical presence. The literature has not yet covered this point. Therefore, this paper aims at revisiting the classification of urban and rural areas in the COVID-19 aftermath. Through desk work and employing qualitative and quantitative research approaches, secondary data was collected from published relevant journals, reports, books, and websites. Content and comparative analysis for analysing qualitative data and content and quantitative comparative analysis and tabulation were used to carry out the research. This paper suggested that the world is in a transitional period towards full urban status. During this period, accessibility to virtual space can be used as a comprehensive criterion for calcifying human settlements into urban and rural.

Keyword: Urbanisation, Urban areas, Rural areas, COVID 19, Virtual space, Smart technology

¹ Zakaria Alcheikh Mahmoud E-mail addresses: zakaria2009@um.edu.my

INTRODUCTION

Criteria for classifying human settlements into urban and rural vary from country to country. They include population size, population occupation, administrative criteria, population density and residential density. Whether all these criteria have been used or some of them, an outright socio-cultural and economic distinction between the two categories of settlements have developed over years around the world. Urban areas usually have higher densities, better and higher-level of education, economic activities other than agriculture and consequently better employment opportunities, business activities and better community facilities. Even the introduction of Information and Telecommunication Revolution products was better in urban areas before COVID 19. For instance, early in 2020, 95 percent of the world urban population were covered by 4G mobile-broadband while 71 percent of the world rural population had access to this service. The products broke physical and time barriers as they created and enhanced virtual spaces for various uses and provided effective communication between people around the clock regardless of their physical location. The responding measures to the widespread of COVID-19 (started late in 2020) of full or partial close-down and work from home revealed two important consequences. Firstly, the significance of virtuality has been recognised when it was applied to keep human activities on during the pandemic. Students were able to receive higher education and employees of many firms were able to carry out their work when they were staying in their rural areas. Secondly, an urgent need has emerged to enhance communication networks in rural as well as urban areas. Under all these circumstances and considering the fact that life after COVID 19 is never like it before the pandemic, the pre-pandemic dichotomy of Urban- Rural classification is getting more and more blurry by virtual boundaries. This will have tremendous consequences, some of which have started emerging. Based on this backdrop, the aim of the paper is to revisit the classification of urban and rural areas in coping with these consequences in an efficient manner.

RESEARCH BACKGROUND

Classification of human settlements into urban and rural

The roots of the modern concept of urban and rural areas dates back to the industrial revolution. Since then, the concept has been one of the major concerns of social and urban theories. The distinction between rural and urban areas in social theories is derived from the concept of modernisation. Rural areas represent the “pre-modern” period and urban areas are always described as “modern” in many respects. The differences between rural and urban areas in urban theories came into existence with the development of an industrial city which was different from its rural counterpart in many basic social and economic characteristics. City is traditionally known as the centre where services and

employment opportunities are available along with commercial, educational and recreational functions. The city is connected with its peripheries through road networks and transportation modes (Hurriyet G. Ogdul, 2010). As summarised by the United Nations (2018), many countries rely on population-based statistics systems in classifying their settlements to urban and rural. Other organisations such as USDA focused on the type and importance of activities that are performed by the people in a landscape whether the activity is primary, secondary or tertiary (Gregor-Fors M., Ian, Vazquez L.-B., 2020).

The definitions of urban and rural vary with time when political and administrative changes take place in a country. Various definitions are made by national statistical offices responding to the complexity and speciality of the urbanisation process of the respective country. For instance, in Australia, before 2001, urban areas were referred to urban centres with 10,000 inhabitants or more. Later, the urban areas are defined where their urban centre has a concentration of urban development and 10,000 people or more with a density of at least 200/km. In Brazil urban areas encompass cities and all towns, while in Canada, areas with a population of 1000 persons and more and a population density of 400 persons per KM² and more are classified as urban. India's urban areas include "statutory places with a municipality, corporation, cantonment board or notified town area committee and areas that inhabited by 5000 people and more, have at least 400 persons per square Kilometre and the economic activities of at least 75% of their male working population are non-agriculture" (International Labour Organisation, no date, p. 1).

Malaysia classified urban based on three types of places: "1) Gazetted areas with their adjoining built-up areas, which had a combined population of 10,000 or more at the time of the Census 2010 or the special development area that can be identified, which at least had a population of 10,000 with at least 60 percent of population (aged 15 years and above) were involved in non-agricultural activities. 2) Built-up areas were contiguous to a gazetted area and had at least 60% of their population (aged 15 years and above) engaged in non-agricultural activities. 3) Special development areas are areas of development that can be identified and separated from any gazetted area or built-up area more than 5 km and the area had a population of at least 10,000 with 60% of the population (aged 15 years and above) were involved in non-agricultural" (Department of Statistics Malaysia, 2021).

Urban and Rural areas disparities: A Narrowing Gap

From the 1950s through the 1980s, the world witnessed, particularly in developing countries, a large-scale people movement from rural to urban areas. The people movement resulted in large-scale informal development in cities and urban environment degradation. Governments reacted by initiating rural development policies and programmes such as electrification, expanding basic education and other services which in general narrowed the gap between rural and urban areas. Since the 1990s onwards, the people's movement to urban areas decreased significantly due to improvement in policies and programs which include the installation of telecommunication infrastructure in rural areas. (Alcheikh Mahmoud, Z., 1999) Nevertheless, rural areas are still lagging behind and will continue, according to the United Nations (2020), to be so in the coming years.

The level of urbanisation and the gap between urban and rural areas differ between the developed and developing countries. It is estimated that 56.2 percent of the world population in 2020, 79.1 percent of population lived in urban areas in developed regions and 51.7 percent in the less developed regions. (United Nations, 2018). Most developed countries have significantly decreased the disparities of economic structure and quality of physical infrastructure between rural and urban areas (Champion, 2011, UN, 2020). With the improvements in communication and transportation, for instance, people were able to leave cities and reside in the peripheral areas and keeping access to jobs and services in urban areas (Refer to Table 1)

Table 1: Selected development indicators in some countries

Country		Cameron	China	Indonesia	Ukraine	Colombia
Urban population	2014	54%	54%	53%	69%	76%
	2050	70%	76%	71%	79%	84%
Employment in Agriculture (% of total employment) 2004/2013		53%	35%	35%	17%	17%
Population Below National Poverty Line (%) 2004/2013	Urban	12%	-----	8%	2%	28%
	Rural	55%	10%	14%	5%	47%
Lower Secondary School Completion Rate (%) 2004/2012	Urban	43%	-----	86%	99%	71%
	Rural	11%	-----	67%	98%	41%
	Urban	94%	98%	93%	98%	97

Population With Access to Improved Drinking Water Source (%) 2006/2012	Rural	52%	85%	76%	98%	74
Population With Access to Improved Sanitation Facility (%) 2006/2012	Urban	62%	74%	71%	96%	85%
	Rural	27%	56%	46%	89%	66%
Skilled Attendance at Delivery (%) 2004/2014	Urban	87%	100	76%	99%	98%
	Rural	47%	100	43%	99%	86%

Source: Constructed by author based on data from International Telecommunication Union. (2020)

Initiatives for redefining urban and rural areas

The narrowing gap between rural and urban areas, the absence of a uniform definition of these areas and the impact of this absence on national and international comparison have been behind the calls to search for a comprehensive, clear cut and precise definition of the boundaries between rural and urban areas. To cite some examples, Ripplinger D., Beck N., Hough J., (2008) proposed “urban population” to individually delineate urban areas and population density to demarcate rural areas. The proposed system is associated with transportation services. Blanca Arellano and Josep Roca (2017) suggested night lights as a new indicator for defining urban and rural areas. They argue that electricity has almost covered every corner of the globe and electricity light can be used as a reliable indicator. Dijkstra L., et al (2018) produced a new methodology with the criterion of “Degree of Urbanisation” as a comprehensive method to delineate urban and rural areas. This method depends on the population grid to classify human settlements into three categories: cities, towns & suburbs, and rural areas. Based on local conditions, the classification can encompass six categories: “cities, towns, suburbs, villages, dispersed rural areas and mostly uninhabited areas” (p. 13).

Technological advances

The dawn of the 21st century has witnessed the transition from the fourth industrial revolution to the fifth which is characterised with a fast pace of innovation creating new environments for more efficient and effective work and technological solutions. The most important production of the fourth industrial revolution is the virtual space which allows people to communicate, meet and

perform work around the clock regardless of their location (Schwab K., 2016). Social media such as Meta (Facebook) and WhatsApp have changed people’s social networks and their goals. Artificial intelligence is the main product of the fifth revolution which is still going on. This revolution is producing smart tools and methods to reach smart solutions. Smart city, smart card, smart grid and smart roads are some examples. Smart technology helps to do many tasks at the same time with minimal effort. It utilises big data to help understand how improvements can be made (Kelly Bowers, 2019). Population coverage by 4G mobile networks in rural Europe has reached as high as 89 percent in 2019 and the percentage of households with Internet access at home in European rural areas was 78 percent, only 10 percent less than the rate in the urban areas in the same years (International Telecommunication Union, 2020). Refer Table 2.

Table 2: Achievement of urban and rural areas of the world, developing and developed world and selected countries in 2019

Country		Population coverage by 4G mobile network	Percentage of households with Internet access at home	Percentage of households with computer access at home, 2019
World	Urban	95%	72%	63%
	Rural	71%	37%	25%
Developed	Urban	100%	87%	84%
	Rural	86%	81%	66%
Developing	Urban	94%	65%	54%
	Rural	70%	28%	17%
Africa	Urban	77%	28%	17%
	Rural	22%	6%	2%
Arab States	Urban	76%	70%	67%
	Rural	44%	36%	34%
Asia & Pacific	Urban	100%	70%	60%
	Rural	89%	36%	22%
Europe	Urban	100%	88%	82%
	Rural	89%	78%	66%

Source: Constructed by author based on data from International Telecommunication Union. (2020)

To combat the widespread Corona virus and its consequences of infection and death, vast majority of the world's countries adopted full and partial closedown which imposed full or partial closure of real spaces where various functions used to take place. Despite the digital disparities between rural and urban areas in many places around the world, virtual space has been used very widely for various types of functions such as education, shopping and office work. Further, smart solutions have been a vital part of the measures that have been made to control the spread of the pandemic. (Sharif A., Khavarian-GAMsir

R. A., 2020). The expanding use of virtual space and smart technology significantly contributes to gradually removing the borders between rural and urban areas around the world (United Nations, 2020). However, no study concerns the potential of advanced technology as a comprehensive criterion to define urban and rural areas. Therefore, this paper aims at revisiting the delineation of urban and rural areas in the aftermath of COVIDS-19.

METHODOLOGY

To reach the above-mentioned aim, this research employed qualitative approach throughout the paper. Through desk work, data were collected from published secondary sources such as online database, websites, books and journal papers. Data was, then, analysed through component and comparison analysis for text data and tabulation and comparison analysis for numerical data. In the research process, a background was built up on classifying urban and rural areas, the narrowing gap between the two categories, initiatives on searching for new and more proper methods to delineate the borders between urban and rural areas, technological advances and COVID-19. In the last stage, the research concluded and suggested some research areas for future.

RESULT AND FINDINGS

During the pandemic, virtual space has been widely used in academic and other related activities at various levels of education, shopping, administrative and other types of works. The measures and the actions for combating the pandemic also provided a good opportunity to try smart solutions in dealing with societal issues. (Sharif A., Khavarian-Gamsir R. A., 2020). Analysing the situation during COVID-19 reveals the following facts

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- Virtual space is efficient in fully accommodating or in supporting the performance of various types of functions that are usually performed in real space.
- Smart technology has been applied to, among other things, enforce and maintain social distancing, identify infected individuals and facilitate quarantine measures.
- Digital divide, which means the differences seen between individuals, companies, organisations, countries and cities in terms of access and use of the information communication technologies, also occur between rural and urban areas within the same country. People who inhabit the rural areas are less digitally included because rural areas experience less technological connectivity in quantity and quality. For example, in all European states the national broadband coverage is higher in urban areas than the rural ones. 2018 statistics show that only 52.3 % of

European rural households had access to high-speed services. (Esteban-Navarro et al., 2020). In an online survey conducted in Malaysia and involved 738 participants, 69% believed that there is urban-rural disparity in terms of internet access users' ability. (Star, 2020).

- There is a need for enhancing internet networks in urban as well as rural areas. Globally, during Covid-9, some students suffered from Poor internet connection (Plitnichenko, 2020) limited resources and ability to access and be involved in online learning. (Selvanathan et al., 2020). Students and teachers in rural parts of India are not familiar with digital technologies, making online learning for them even more challenging. Rural population is in need for proper training about digital technologies and more user-friendly platforms for comfortable online teaching and learning in this country (Dham, 2020).
- During COVID19, governments adopted some urgent measures to compensate for the shortcomings of infrastructure for telecommunication and internet in rural areas. Governments also start working on medium- and long-term plans for enhancing these infrastructures in rural and urban areas.
- Nevertheless, the boundaries between urban and rural areas are getting more and more blurred by virtual space.
- Smart technology and the relevant emerging application started penetrating to rural areas. This is expected to continue in an accelerating pace in the coming years. The expansion of smart technology applications to cover rural affairs will contribute to eliminating the boundaries between rural and urban areas.

Virtual space, the product of the advances of telecommunication and information technology, through internet and mobile networks has provided people with several advantages that were never possible earlier. Virtual space has broken distance and time barriers and enabled people to meet and carry out various types of activities with no need to be present in one physical space. Through virtual space, people can communicate, discuss, and work individually or in groups regardless of time and location. A person who is present in Asia for instance, can do through virtual space, office work for a firm in Latin America and a student in Europe can attend a university lecture organised in a university hall in Asia.

Virtual work performance

- Fully performance: Virtual space enables people to fully carry out some activities such as classroom lectures. A theoretical class in a school or a university can be executed interactively through a web platform. The

class can be recorded, and any student can watch the recorded class any time later. Exams can be carried out in virtual spaces as well.

- Partially performance: some other activities can be partially performed in the virtual spaces. For example, some stages of the planning process can be completed in virtual space such as discussing with the client, submission of documents for planning permission. Other stages require physical presence of people to carry out the planning process such as site preparation and development.
- Performance that is not possible virtually: At present, there are some functions that need full people’s physical presence in the place of the activity. A barber is not able to conduct an online performance of a haircut (Schwab K., 2016). Figure 1 explains types of virtual work performance.

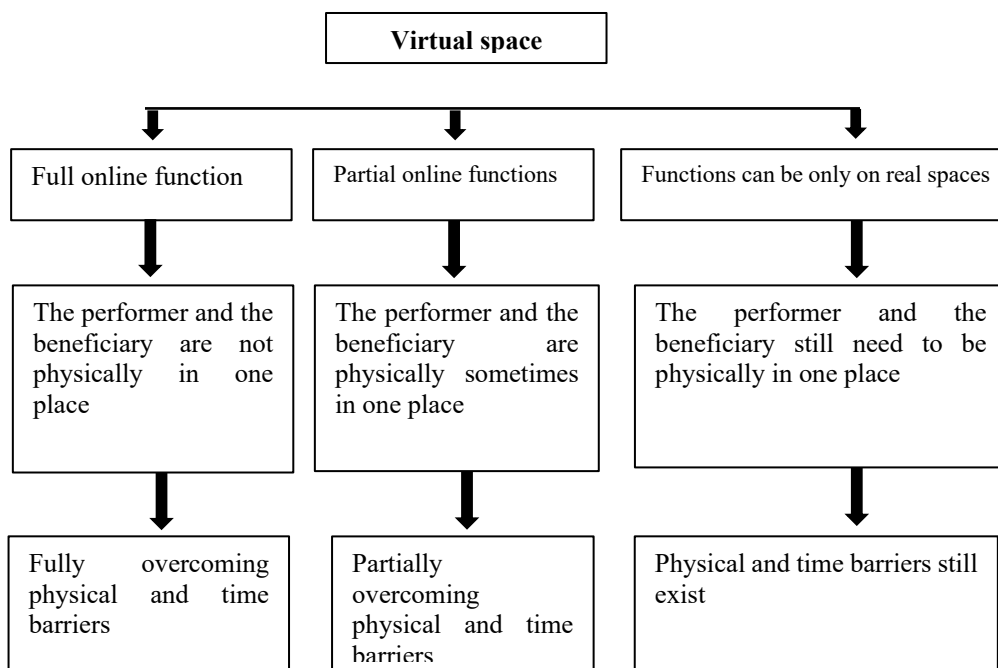


Figure 1: Types of virtual work performance
 Source: Authors, 2021

Smart technology can understand the performance of people by analysing it and producing an automated, personalised service. It considers external factors, analyses them and supports them in making decisions. Smart technology makes processes and systems more efficient, and people more productive through

making use of big data to track and analyse what is going on for better results in the future (Kelly Bowers, 2019).

DISCUSSION

Virtual space and social media have provided to urban and rural populations alike easy accessibility to education, banking services, government administration units and other urban facilities. Students can join online educational classes from their rural villages or remote places. Concerned persons can join virtual conferences in urban areas of their country and outside it. People can now perform various types of banking transactions from their homes. With the gradual penetration of smart solutions to rural areas and the promising application of smart villages around the world, efficient health facilities will be available to rural areas in the near future.

The three utilities of electricity, drinking water and sanitation are not used individually or in combination as an independent criterion for defining urban and rural areas. They are always used along with other infrastructure facilities and amenities such as roads (United Nations, 2018). Virtual space has nothing to do with the three utilities, but smart technology is promising in providing smart solutions to make electricity, water and sanitation more available. Smart management system for water, sanitation (African Union Development Agency, 2021), and electricity (Kelly Bowers, 2019), has been successfully tried to improve the accessibility to each of the three utilities. On the other hand, there is in general, no wide gap of access to electricity between rural and urban areas. This fact motivated some researchers to call for using the intensity of night lights as a criterion for human settlements classification (Blanca Arellano, Josep Roca, 2017). The increasing dependency on renewable power sources such as solar energy along with smart technology which proved that could save energy (Kelly Bowers, 2019), making the differences between rural and urban areas in the availability of electricity will be of minimal importance. It is worth mentioning here that there are still urban localities with no proper access to electricity. In 2019, the rate of urban areas with access to electricity was 45%, 92.7% and 87.9 % in Malawi, Myanmar, and South Africa respectively (The World Bank, 2020). With all these facts, the three utilities cannot be considered alone as an efficient criterion for delineating borders between urban and rural areas.

The discussion above clearly shows that the advances in technology and their productions of virtual space and smart technology are abating the borders between rural and urban areas. However, the digital disparities between rural and urban areas are expected to continue for a time that will be different from country to country. Technological advances are getting on unabated leading to total collapse of borders between urban and rural areas in the near future. Consequently, accessibility to virtual space is suggested to be used as the criterion

for classifying human settlements into urban and rural. Accessibility may include sub criteria such as mobile per person, speed of the internet, number of hours of using the internet or may some other or more indicators. This needs further research. The ongoing scenario of gap narrowing between rural and urban areas which is expected to lead to fully an urban world is and will be having significant development implications.

CONCLUSION

There is no international consensus on a comprehensive criterion to classify human settlements into urban and rural settlements. Different national criteria are used for delineating the borders between the two types of settlements. The main components of the criteria are population size, population density, population economic activity, administrative, legal, services and facilities. The gap between rural and urban areas are narrowing down. However, disparities between the two settlement categories still exist in various forms. Significant portion of the rural population in some countries like Cameroon (55%) is still below the poverty line of the country while the rate of urban population under the poverty line is 12% in this country. Even digital disparities can be found in world regions. 89% of Europe's rural areas are covered by 4G mobile networks and 44 % of the rural population of Arab states while 100% and 76 % of the population of the two regions respectively are covered by the same network. With the advancement of technology and the increasing usage of its products of virtual space and smart technology, particularly during the COVID-19 pandemic, the borders between rural and urban areas are getting more and more blurry. This paper has proved that virtual space and smart technology are abating the borders between rural and urban areas in particular economic activities and urban accessibility to urban facilities such as education. The continuity of digital disparities between rural and urban areas will depend on the national relevant development programme. However, with the enhancement of digitisation of rural and urban areas and with the increasing penetration of smart technology to rural areas, the borders between the two types of human settlements will collapse putting the world in full urban status. Till that day on which we do not need classification criteria, accessibility to virtual space is recommended as a comprehensive criterion for classifying human settlements into urban and rural. The move of the world to a fully urban world has significant consequences which needs special research attention and efforts.

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