

E-urbanism: E-commerce, migration, and the transformation of Taobao villages in urban China[☆]

Yanliu Lin

Department of Human Geography and Planning, Utrecht University, Vening Meineszgebouw A, Princetonlaan 8a, 3584 CB Utrecht, the Netherlands



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ABSTRACT

The development of information and communications technology (ICT) has promoted the rapid growth of e-commerce, which has gradually changed the city. Networking and migration are also key driving forces for contemporary urban development. Although a growing body of literature has studied e-commerce development, there is a lack of theoretical and empirical research to understand the impact of e-commerce and migration on urbanism. This study is an attempt to fill the gap. It firstly proposes a concept framework of E-urbanism that includes three interwoven layers, namely of ICT infrastructure and production networks, social networks and power relations, and urban form and land use. The framework is then applied to understand the influence of e-commerce and migration on the socio-spatial transformation of Taobao villages in Guangzhou city, China. This article concludes that ICT infrastructure and production networks form the foundation of e-commerce development, while social networks of rural migrants are important sources of social capital in the formation of Taobao villages. The existing physical forms provide opportunities for e-commerce growth, which has in turn reshaped them. E-commerce is fundamentally revolutionizing urbanism, the intertwinement of social and spatial reorganization of the city.

1. Introduction

The recent development of the Internet, smartphones and online social networks contributes to the rapid growth of e-commerce, which becomes more and more important in economic development and has gradually changed our society. In the United States, for example, its share in total manufacturing revenue surged from 19% in 2002 to more than half in 2012 (UNCTAD, 2015). Since enterprises and consumers have increasingly embraced online transactions, the global landscape is rapidly changing, with developing countries as a group assuming a more prominent role as both buyers and sellers of online goods and services. Besides the United States, China has most of the top e-commerce companies in the world.

Although there has been a growing scholarly interest in e-commerce development and management, there is a lack of theoretical and empirical evidence on the impact of e-commerce on urbanism. Recently, some Chinese studies have paid attention to the influence of e-commerce on rural development and rural life. The rapid development of e-commerce has led to the booming of Taobao villages, the number of

which dramatically increased from 3 in 2009 to more than 2100 in 2017 (AliResearch, 2017). Taobao village is a cluster of rural e-tailers, where at least 10% of rural households engage in e-commerce or at least 100 online shops are open in the village. E-commerce activities of Taobao village rely on the platform of Taobao.com - a top online shopping giant in China. Taobao villages have gradually changed the pattern of the rural economy as well as the social foundation of rural daily life throughout China. Zhu and Qi (2015) indicate that e-commerce plays an important role in increasing farmer's incomes, alleviating rural poverty, and promoting rural development. Lin, Xie, and Lv (2016) elaborate that the development of e-commerce and network technology has changed the common values held towards rural life and the pace of life of local people. Xu, Lv, and Wen (2015) point out that the growing popularity of e-commerce has led to more equal opportunities of human resources and economic entities in cities and villages. They argue that e-commerce has driven in-situ urbanization of counties and rural development will become a tendency of urbanization. The existing literature mainly focuses on Taobao villages in remote China, while few studies have been conducted to understand Taobao villages

[☆] Author information

I am an assistant professor at the Department of Human Geography and Planning in Utrecht University. I have conducted intensive research on Chinese "villages in the city", migration, and social housing provision. My recent research interests include the application of new technologies in urban planning, and the influence of sharing economy on urban and rural transformation.

E-mail address: y.lin@uu.nl.

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in the city. Let alone the impact of e-commerce on urban development remain questioned, despite its fundamental characters.

Hence, this study is an attempt to fill the gap by investigating the influence of e-commerce and migration on the formation and transformation of Taobao villages in urban China. Empirical works focus on Taobao villages in Guangzhou, which is one of the three Chinese cities with the largest number of online shops. These Taobao villages are also “villages in the city” (ViCs) or “urban villages” – informal settlements and migrant enclaves in contemporary Chinese cities (He, 2013; Lin, De Meulder, & Wang, 2011; Liu, He, Wu, & Webster, 2010). ViCs were once traditional rural settlements on the edges of cities, and swallowed by urban development in the process of rapid urbanization. Indigenous villagers have “illegally” extruded their houses to accommodate a large number of rural migrants, who are often excluded by the formal urban system due to a lack of urban hukou. They provide informal housing, cheap services, and job opportunities to these migrants. In Guangzhou, many ViCs are in close proximity to urban areas and access to public transportation. Although it might be true that ViCs as informal settlements are seen as problematic, it is clear that e-commerce has tactically and strategically exploited the locational assets (physical, social, and economic aspects) of ViCs that benefit to the development of e-commerce and facilitate socio-spatial changes.

This article will contribute to theories of urbanism by including the role of e-commerce. It firstly develops a conceptual framework of E-urbanism, which includes three interwoven layers, namely of ICT and production networks, social networks and power relations, and urban form and land use. This framework is then tested by case studies in Guangzhou. A mixed-methods approach, which combines field observation, photography, mapping, semi-structure interviews, and questionnaires, is adopted to survey the case studies. This article concludes that the layer of ICT infrastructure and production networks is the foundation of e-commerce growth, while social networks of rural migrants are important sources of social capital in the formation of Taobao villages. The existing physical forms provide opportunities for e-commerce growth, which has in turn reshaped them. E-commerce, as a technological innovation, is fundamentally revolutionizing urbanism, the intertwining of social and spatial reorganization of the city.

2. Theoretical background

2.1. Theories of urbanism

Theories of urbanism have been developed by scholars from different perspectives. According to the geographer Harvey (1973, 251), “urbanism, as a general phenomenon, should not be viewed as the history of particular cities, but as the history of the system of cities within, between and around which the surplus circulates”. He argues that the opening up of new resources (through technology or the opening up of new trade routes) can bring about rapid shifts in the circulation of surplus and important places into being. Similarly, Massey (1978) suggests that the analysis of uneven development should investigate the patterns of capital accumulation, from which geographical analysis must then produce the concepts in the terms of the spatial divisions of labour. Shin (2016) argues that China’s urbanization has become synonymous with accumulation, involving mutual reinforcement between the primary and secondary circuits of accumulation. Recently, the improvement and expansion of ICT infrastructure on a national scale and the development of e-commerce have provided more equal opportunities for cities and villages, and rural development is a new trend of urbanization (Xu et al., 2015). Consequently, many rural areas are becoming central to the circulation of capital, since cheap land and rural labour surplus are available for e-commerce growth.

Urbanism is also understood as human and social discourses by those scholars following the works of Lefebvre (1971) and Habermas (1984). A related concept is everyday urbanism (Chase, Grawford, &

Kaliski, 2008), in which the city is regarded as a social product, created out of the demands of everyday use and the social struggles of urban inhabitants. However, everyday urbanism mainly focuses on bottom-up initiatives, with little attention to structural forces and the impact of strong stakeholders. Recent studies emphasize social networks and power relations between various stakeholders (e.g. government, enterprises, civil society, and households) in spatial transformation (Healey, 2007).

With the increasingly influence of globalization and neoliberalism, enclave urbanism becomes the hallmark of a number of globalizing cities, featuring intensified spatial and temporal division (Marcuse, 2000). Informal settlements or migrant enclaves are articulations of enclave urbanism, characterized by the concentration of the poor or migrants, a lack of public facilities, socially and spatially segregated from formal cities. In China, ViCs are migrant enclaves with intangible boundaries imposed by the rural-urban division. He (2013) argues that ViCs are often regarded as the least desirable forms of urban enclave, but the social mobility of their residents is comparatively high and economically active and optimistic.

There is also a growing body of literature on the impact of ICT infrastructure and networks on urbanism. Dupuy (1991, 2008) applies network theory to the field of urbanism and presents three levels of networks in the context of urbanism: the technical networks, the production/consumption networks, and the individual household networks. Nevertheless, infrastructure networks and digital innovations can also lead to splintering urbanism, i.e. fragmentation and enclave formation in the restructuring of cities (Graham & Marvin, 2001). Recently, smart urbanism is emerging at the intersection of visions for the future of urban places, new technologies and infrastructures (Luque-Ayala & Marvin, 2015). A city is smart when the “utilization of networked infrastructure to improve economic and political efficiency and enable social, cultural and urban development” (Hollands, 2008). Smart urbanism emphasizes the importance of “infrastructure” which includes business services and ICTs (mobile phones, e-commerce, Internet services, etc.). However, smart cities are criticized for the dominance of economic interests and a lack of opportunities for marginalized groups (De Jong, Joss, Schraven, Zhan, & Weijnen, 2015).

Although recent studies on smart cities have paid attention to the important role of ICT infrastructure in urban development, there is a lack of theoretical and empirical research on the increasing influence of e-commerce on urbanism. Migration is another important factor that drives contemporary urban development on a global scale. This research fills the knowledge gap by establishing a conceptual framework to understand the influence of e-commerce and migration on urbanism, especially in the context of Taobao villages in urban China. Taobao villages are also ViCs, which are understood as a type of urbanism, i.e. the producers and assemblers of differentiation and vitality in the city and could be seen as the experimental scenes for unseen developments (De Meulder & Shannon, 2014). They are the receptacles of opportunities, with complex social and entrepreneurial networks and spontaneous spatial forms (ibid). Therefore, studies on urbanism in the context of Taobao villages should pay attention to the dynamic process of socio-spatial and economic transformation.

2.2. Conceptual framework

Building and extending the mentioned network urbanism (Dupuy, 1991, 2008), this framework combines the technical networks and the production/consumption networks into a layer of ICT network and production network, since these two types of networks are interweaved with each other in e-commerce activities. The framework also extends the network of individual householders by including power relations between various stakeholders, which is crucial to understand contemporary urban development (Healey, 2007). Since there is a complex relationship between the existing spatial features and the formation of Taobao villages, this framework also has a spatial dimension. The

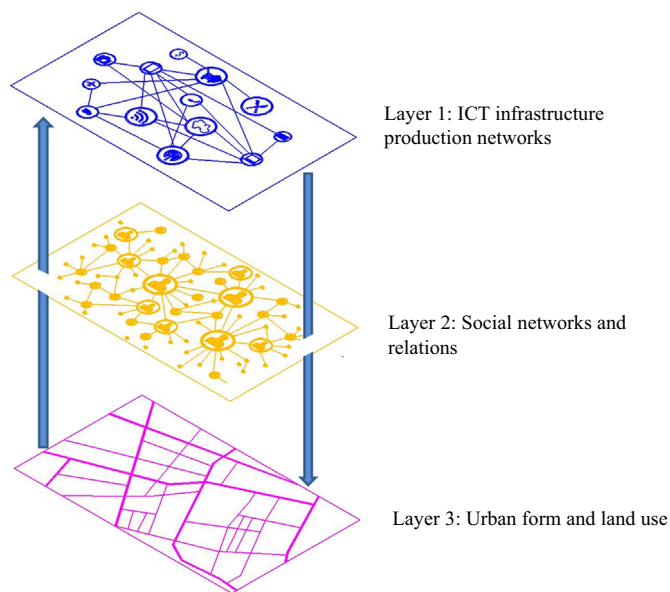


Fig. 1. Three interwoven layers.

transformation of ViCs is viewed as a territorialisation process (Hsing, 2010), since there are conflicts of interest among various stakeholders in reframing a bounded space. However, recent research shows that regions cannot be understood merely as self-contained entities, because of their relational positions as nodes in wider economic and cultural environment and processes (Paasi, 2013). The current resurgence of territory can be seen as a result of networked socio-technical practices and a product of relational networks (Paasi & Metzger, 2017; Painter, 2010). This suggests that there could be complex relationships between socio-technical networks, power relations and spatial reconfiguration inside and outside Taobao villages, which is the new varieties of ViCs. Therefore, the framework has three interwoven layers (Fig. 1).

- **Layer 1:** ICT infrastructure and production networks, including e-commerce platforms, the Internet, Wi-Fi, broadband, social media, smartphones, online and offline retail/wholesale systems, local industry, online payment systems, express delivery systems, and services;
- **Layer 2:** Social networks of households such as rural migrants, and power relations between various stakeholders (e.g. government, villagers, and migrant entrepreneurs);
- **Layer 3:** Urban form and land use, referring to location, proximity, physical forms (e.g. street patterns, building patterns), land ownership and property rights.

These three layers are interwoven with each other. The layer of ICT infrastructure and production networks forms a foundation for e-commerce development, provides new platforms for social networking, and drive spatial transformation. Social networks provide important social capital for the development of e-commerce and its production network. The existing physical forms provide opportunities for e-commerce development, which in turn reshape them.

- **ICT infrastructure and production networks**

ICT infrastructure and production networks are interwoven with each other in the context of e-commerce. E-commerce development requires technological innovation and accessibility of the Internet, Wi-Fi, social media, smartphone, devices, computers and other ICT infrastructure. It also needs effective online and offline retail systems, online payment systems, express delivery systems, and services.

The technical network and the production/consumption network

are two key layers of network urbanism (Dupuy, 1991, 2008). The technical network is the level-one operator, including road networks, public transport networks and communication networks. The production and consumption network is the level-two operator, including service providers such as retail and transport services. In the context of Taobao villages, traditionally offline wholesale and retail systems and local industry are parts of the production network, because e-tailers often buy goods from wholesale markets and local processing workshops or factories and then sell them in online shops (Alibaba Group, 2015). Nevertheless, to some extent the technical network and the production/consumption network are interwoven with each other. For instance, the online shopping system is not only a part of the technical network but also a component of the production/consumption network. Therefore, this research integrates the mentioned two layers of network urbanism into the layer of ICT infrastructure and production networks, which is a foundation of e-commerce growth.

Most studies of e-commerce mainly arise in the field of economics and business. The development of social media and Web 2.0 has provided a huge potential to transform e-commerce from a product-oriented environment to a social and customer-centred one (Wigand, Renjamine, & Birkland, 2008). This new phenomenon is commonly referred to as social commerce, which involves the use of Internet-based media that allows people to participate in the marketing, selling, comparing, curating, buying and sharing of products and services in both online and offline marketplaces (Zhou, Zhang, & Zimmermann, 2013). Nevertheless, the development of e-commerce has been constrained by a number of factors, such as social networking activities, Internet access, effective financial and logistics systems (UNCTAD, 2015). Due to the rapid development of ICT infrastructure, e-commerce has rapidly developed in China and Mobile Taobao becomes the world's largest social commerce platform, where customers can buy online goods, interact with e-tailers, and share their contents with friends and other people. Some recent research has paid attention to the increasing influence of e-commerce in poverty alleviation and the socio-spatial transformation of rural areas in China (e.g. Xu et al., 2015).

- **Social networks of migrants and power relations of various actors**

With the emergence of the network society, Castells (1996) argues that networks constitute the new social morphology of our societies and they reframe power relations. Considering the impact of the network society, Dupuy (1991) suggests that the network of individual households is one of the crucial layers of network urbanism. The personal network makes up of “all of the points crucial to one's personal life, including close family and parents' friends, for example, together, in the case of households with children, with crèches, schools and various children's activities located in various places” (Dupuy, 2008, p.47).

Networks have also attracted increasing attention in the field of migration studies. Social networks provide migrants with emotional, informational and instrumental support in both every day and crisis situations (Boost & Oosterlynck, 2016). A related term is “translocality” that originally refers to the importance of localities in migrants' transnational connections and practice (Smith, 1998). It is recently used to understand how rural migrants create their social spaces through enclave-based or translocal networks and practices (Liu, Li, & Chen, 2014). The translocal networks facilitate the emergence of migrant entrepreneurs and the formation and development of migrant enclaves – ViCs in Chinese cities. Compared with their counterparts in the general economy, migrant entrepreneurs and employees involved in the enclave economy are more capable of mobilising market resources and therefore achieve greater economic success (Zhou, 1992). Informal economic activities relying on social networks and reciprocity are important survival strategies for rural migrants, as they reduce the transaction cost and supply opportunities for migrant entrepreneurs (Lin et al., 2011). Therefore, social networks are crucial to the everyday life and work of migrants, and can influence the transformation of

migrant enclaves. It is also widely discussed in the previous studies that these networks are formed based on specific places or translocality. Nevertheless, recent research show that the networks of migrants can be influenced by social media, which is the virtual infrastructure of media rich, synchronous and relatively open contacts actively transforming the nature of these networks and thus facilitating migration (Dekker & Engbersen, 2014). In other words, ICT infrastructure facilitates the communication of migrants and transforms their networks.

Besides household networks, the relationships between various stakeholders (households, government, civil society organizations, etc.) have gained increasing attention. Urban areas have always some forms of place-governance, i.e. the interactions between different webs of relations and spheres of governance activities work out to affect the experience of place quality (Healey, 2007). Regions are produced and reproduced by social actors in and through variegated social practices and discourses (Paasi & Metzger, 2017). In the context of ViCs in China, special attention is paid to the interests and power relations of the village organization, villagers, migrants (including migrant elites), and local governments in producing and reproducing space (Lai, Chan, & Choy, 2016; Lin et al., 2011).

• Urban form and land use

Since Dupuy's three original network levels could not operate dissociated from the spatial setting, Rocco (2008) introduces additional geographic features to the network approach in order to make it able to be used for analyzing and evaluating spatial planning. These geographical features include location, proximity, and distance. Location and clustering effects have traditionally been the focus of geographic and economic studies. Porter (1998) argues that cluster-driven agglomerations are sources of productivity and innovation, since they can reduce the transaction cost and improve the flow of information. Guo, Liang, and Luo (2014) find the cluster effects generated by the agglomeration of e-tailers in Taobao villages in China.

In the Chinese context, the dual land use system also largely affects urban form such as street and building patterns. There are two types of land, i.e. urban land owned by the state and collective land owned by the village. The village can possess, use and benefit from the ownership of land (including residential land and collective industrial land), but does not have the right to dispose of the land. Each village household can acquire a small piece of residential land from the village for self-housing, but the household cannot sell or rent it out. In practice, it is common that villagers of ViCs extrude their houses to accommodate the housing demand of rural migrants in Chinese cities (Hao, Hooimeijer, Sliuzas, & Geertman, 2013; Liu et al., 2010). Villagers may also sell their houses to rural migrants, resulting in the so-called “Small Property Rights Housing” which is not recognized by the state regulation. The village organizations are responsible for the construction of infrastructure such as streets and often collaborate with external enterprises to investigate in the constructions on collective industrial land (Lai et al., 2016). Therefore, the proximity to urban land uses, cheap collective land and informal housing have provided opportunities for the rapid development of e-commerce in ViCs and driven them to become Taobao villages in urban China.

3. Data collection and methods

This study selected three cases (villages of Lirendong, Xi'niujiao, and Yushatan) in Guangzhou city for in-depth analysis. With a large number of online shops, the villages of Lirendong and Xi'niujiao rank the top ten Taobao villages at the national level. They are representative cases of Taobao villages in the city and even in a national scale. Yushatan is transforming into a mature Taobao village. It is interesting to examine whether there are similarities and differences between the mature and growing Taobao villages and understand what kinds of socio-spatial factors drive their transformation.

Since it was difficult to find rural migrants who were e-tailers and their concentrated areas in Taobao villages, I conducted two periods of in-depth fieldwork in the mentioned three Taobao villages in December 2015 and in March and April 2016. In the first period of fieldwork in 2015, I used the technique of snowball sampling to reach some migrant elites and a group of migrants, who had strong social networks in the three Taobao villages. Through the support of scholars and students at South China University of Technology, I successfully interviewed some migrant elites and entrepreneurs, who employed their relatives and friends to work in their companies. These migrant elites were the initial contacts, using their networks to nominate other migrants for interviews. A number of in-depth interviews lasting 1–2 h were conducted with the migrants to understand the role of social networks in facilitating e-commerce development and the emergence of migrant entrepreneurs as well as reframing power relations. They also led to understand social, economic and technical factors that drove the spatial transformation of Taobao villages. The contents of the interview include interviewees' professional and educational backgrounds, the spatial conditions of their living and working places, housing property rights, their social networks with other migrants and the leadership in the networks, and their relations with villagers and local governments in e-commerce development and the transformation process. Besides, I visited the three Taobao villages, observing building and street patterns and different social and economic activities along the main streets and other parts of the villages. I also visited several villager's houses and had informal talks with villagers and migrants about the functions of different floors and units of the houses. I documented how rural migrants and villagers used and transformed spaces through every day practices, based on photos and field notes. This documentation allowed me to understand the daily practices of migrants and villagers in transforming physical forms, and identify the spatial concentration of migrants in these villages.

The second period of fieldwork was conducted based on the outputs of the first period of fieldwork. The mentioned interviews and observation helped me to identify the major areas of the three Taobao villages, where there were a high concentration of rural migrants involved in e-commerce activities, for cluster sampling. With the support of scholars and students from South China University of Technology, a total number of 288 questionnaires were randomly distributed to rural migrants in the mentioned major areas of the three Taobao villages, and 283 valid ones were retrieved. Since indigenous villagers can earn a living through renting their houses and collective properties, very few of them are involved in e-commerce activities. Therefore, the questionnaire survey did not select them as a sample group. The contents of the questionnaire included genders, education, age, occupation, the use of ICT infrastructure (computer, Internet, smartphone, social media, etc.), e-commerce facilities and services (purchase channels, express delivery, etc.), and their opinions on the further improvement of Taobao villages. For instance, do you use smart phone? What kinds of social media do you use for your jobs and daily communication? In your opinion, what kinds of supporting facilities should be established or improved by the government in order to promote the further development of Taobao villages? What are the main reasons for the concentration of e-tailers in the village? The outcomes of questionnaires reflected the influence of social networks and the ICT and production networks on the transformation of Taobao villages. They also led to understand a number of issues related to e-commerce development, such as finance, express delivery, and sanitation.

4. The emergence of Taobao villages in China

The recent development of ICT in China has promoted the widespread use of the Internet and the emergence of e-commerce and new patterns of socio-spatial transformation. With the rapid expansion and diffusion of the Internet since the 1990s, consumers have adopted Internet technology into their daily lives. The Chinese Internet becomes

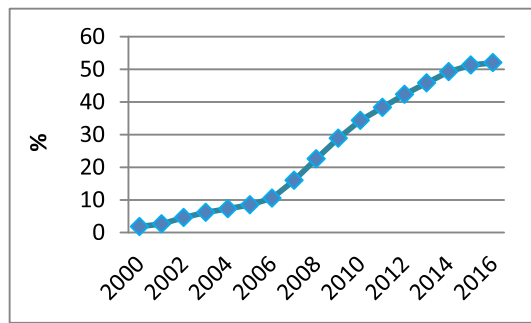


Fig. 2. Internet Penetration in China (based on Internet Live Stats, 2016).

the world's largest network in terms of numbers of users and websites. The internet penetration rate rapidly increased from 1.8% in 2000 to 52.2% in 2016; China's netizen population reached 721 million (Fig. 2). In December 2016, China's mobile phone users had a number of 695 million, and mobile internet users comprised 95.1% of the total mobile phone users (CNNIC, 2017). Three major social media apps (WeChat, QQ and Weibo) were widely used by different social groups in China. The usage rates of these social media were respectively 85.8%, 67.8% and 37.1% (ibid).

At the same time, e-commerce has quickly established itself and is estimated to achieve a faster growth speed in the coming years (Fig. 3). The most batch of domestic e-commerce websites emerged in the 1990s, including Alibaba.com, which is a notable e-commerce generalist player pursuing economies of scale with a focus on the mass market. Founded by Alibaba Group in 2003, Taobao Marketplace facilitates consumer-to-consumer retail and provides a platform for small business and individual entrepreneurs to open online shops that cater consumers in China and Broad. The widespread use of the Internet, smartphone apps, and social media in recent years has promoted e-commerce growth, resulting in an increase in the number of online shoppers and e-tailers. Especially, the rapid development of Taobao has been facilitated by its social commerce efforts on two popular mobile apps, namely of Qianqiu App for e-tailers and Taobao Mobile App for online shoppers. Consequently, China's online shoppers reached 467 million, accounting for 63.8% of the total internet users, of which mobile phone online shoppers had a number of 441 million (CNNIC, 2017).

In such a context, Taobao villages have emerged in both rural and urban areas and their number has dramatically increased in the past few years (Fig. 4). Rural households can directly sell all kinds of products, such as agriculture products, electronics, toys, and clothing, throughout Taobao.com with relatively little transaction costs. E-commerce provides an innovative approach for poverty alleviation in rural areas, since it brings new income for villagers and promotes the development of many poor villages (Qi, 2018; Qian, Chen, Liu, Zhang, et al., 2017). Besides its fundamental effects on remote villages, e-commerce has provided new economic opportunities for rural migrants

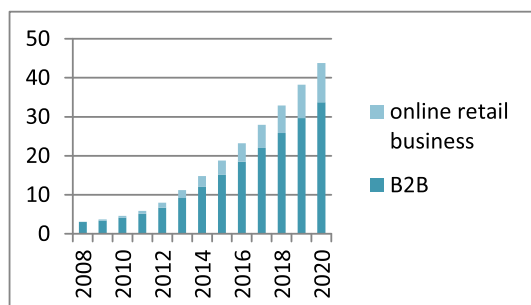


Fig. 3. The growth of e-commerce in China (based on AliResearch).

in the city and becomes a new driving force of socio-spatial transformation in urban China.

5. Empirical works in Guangzhou city

Guangzhou is an important and historically commercial centre in South China. Its tertiary sector is crucial to the urban economy and has dramatically developed in the past few decades, comprising 70.6% of GDP in 2015 (Guangzhou Statistical Bureau, 2016). There are a large number of wholesale markets, which sell clothing, leather goods, auto parts, electronic appliance and many other goods to the rest of China and abroad. The wholesale markets are supported by the major industrial sector in the city. Auto parts manufacturing and electronic appliance manufacturing are two of three pillar industries, while garments and leather shoes are the products of major industries in the city (ibid).

As one of the three Chinese cities with the largest number of online shops, Guangzhou had 106 Taobao villages in 2017 (AliResearch and SRN, 2017), selling different kinds of goods, such as clothing, auto parts, and electronic appliance, though online shops. Taobao villages have a close relation with the wholesale markets in the city. They are also ViCs, which were once traditional rural settlements and swallowed by urban areas. ViCs are migrant enclaves that provide informal housing, cheap services, and job opportunities for rural migrants in Chinese cities (Lin et al., 2011). They are often in a close proximity to urban areas such as commercial and industrial areas and public facilities such as public transportation. The cheap collective land, informal characteristics and the proximity to urban land uses offers ViCs many opportunities for e-commerce development.

5.1. ICT infrastructure, production networks, and skilled young migrants

Taobao villages have good ICT infrastructure, such as broadband networks and Wi-Fi, which are crucial for e-commerce development. ICT infrastructure provides a foundation for the production network, so e-tailers can access to the Internet, the seller mobile work platform, and social media by using their computers and smartphones to operate their online shops, communicate with customers, and deal with online orders and payments. Besides, these villages have a larger number of skilled young migrants, who play a crucial role in e-commerce development and socio-spatial transformation.

In this survey, the contents of the questionnaires, which were distributed to rural migrants in the three Taobao villages in the second period of in-depth fieldwork, include migrants' gender, education, age, and occupation as well as whether they are smartphone users (Table 1). The results of the questionnaires show that about 86% of the interviewees are less than 35 years old. This suggests that rural migrants in the villages are mainly the new regeneration of rural migrants, who were born after 1980. A considerable amount of them also have good educational backgrounds: 37.7% of them graduated in senior high schools and 24.6% of them graduated in universities or above. As the second-regeneration labour migrants, young migrants have generally received higher level of education than the first-generation labour migrants who mainly work in labour-intensive industries (Liu, Geertman, Lin, & van Oort, 2017). They have better skills in operating mobile phones, computers and the Internet than the old generation of rural migrants. It also seems that e-commerce has a gender preference, since the number of male migrants is larger than that of female migrants. This finding is similar to a report of the Alibaba Research Center, which shows that 61% of the owners of online shops is male and 59.5% of the employees of online shops is male (RTCAEP, 2014). The report points out that the online entrepreneurs are mainly young men under 34 years old, and most of them completed the senior high school education or attained a higher level of education. This may be because e-commerce activities require skilled workers, who receive good education and are good at computers and the Internet.

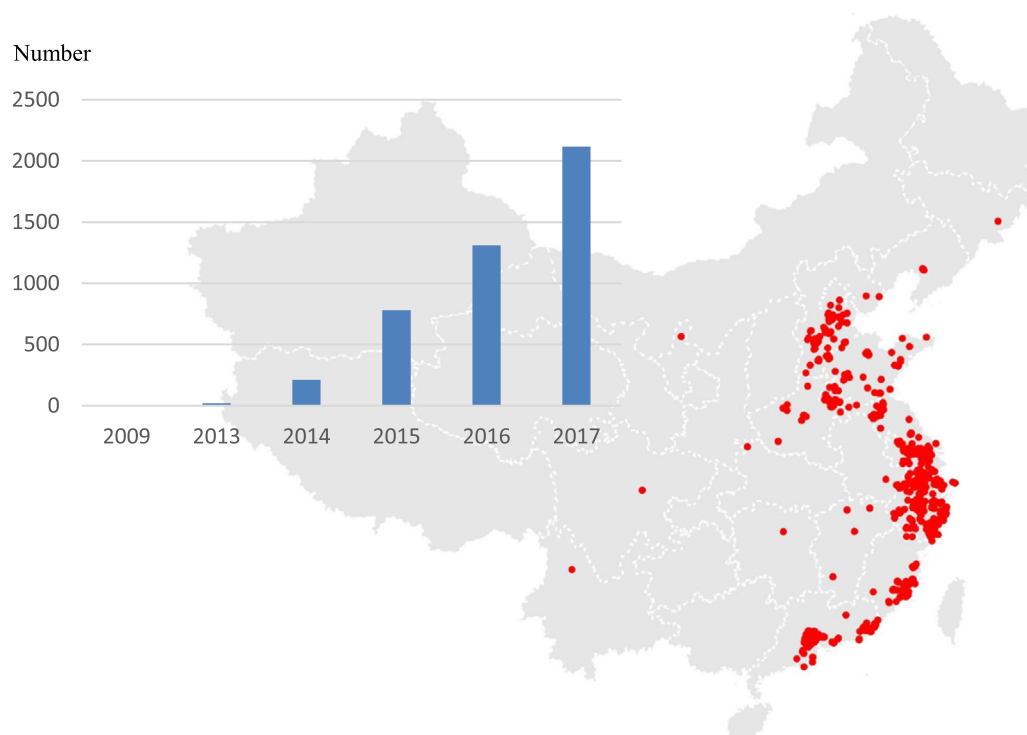


Fig. 4. The distribution of Taobao villages in China (based on AliResearch).

Table 1

Basic information of the sample.

Variable (n = 283)	Properties	Percent (%)
Gender	Male	60.1
	Female	39.9
Education	Primary school	6.5
	Junior middle school	31.2
	Senior high school	37.7
	University and above	24.6
Age distribution	Under 15	3.6
	15–25	39.3
	25–35	42.9
	35–45	12.4
	Above 45	1.8
Occupation	Shop owner	14.2
	Entrepreneur	3.3
	E-tailer	25.9
	Courier	3.3
	Worker	41.5
Smartphone	Other	11.8
	Smartphone user	89.0
	Non-smartphone user	11.0

About 26% of the interviewees are e-tailers who are indirectly involved in e-commerce, while others are shop owners, entrepreneurs, workers, and couriers. The development of e-commerce requires a good logistics system (express courier services, etc.), daily services (photo studios, catering, grocery stores, etc.), and small processing workshops or factories. It is thus not surprising that a considerable number of rural migrants in these Taobao villages have been involved related service and manufacturing sectors, becoming a part of the production network. As observed during my fieldwork, there were dozens of express delivery companies in each Taobao village. Workers of these companies delivered goods even in the evening, so e-tailers could send the goods on the same day after customer orders. The effective deliver system promotes the satisfactions of online shoppers and facilitates e-commerce growth. As showed in the results of the questionnaire survey (Fig. 5), “good services and facilities” is the most important reason why rural migrants

concentrate in the villages for e-commerce business.

The majority of rural migrants (89%) have smartphones, using for online shop operation, daily calling, chatting and entertainment. Different from the old rural migrants, these young migrants are “smarter” equipped with affordable smartphones and computers, and familiar with the Internet and social media. They manage their online shops through taobao.com by using computers in their apartments (Fig. 6). They can also freely download a mobile app called Qianniu (Kilonewton), which is a seller mobile work platform of Taobao.com. They use this app for managing their shops, dealing with orders, and chatting with customers in real time. This seller mobile app together with the buyer mobile app (Taobao Mobile App) makes Taobao having social commerce features. The former enables e-tailers to communicate with online shoppers anytime, while the later makes online shoppers easily get the information about products and share it with their friends and others.

The outcomes of the questionnaires also reflect that WeChat is the most popular social media platform for migrants' daily communication, exchange of job information, social networking, and broadcasting information of their shops. Therefore, smartphones, mobile apps, and social media have not only been the key components of the ICT infrastructure and production networks for e-commerce growth, but also provided new platforms for migrants' networking and information exchange.

5.2. Social networks, migrant entrepreneurs, and power relations

The outcomes of questionnaires (see Fig. 5) show that the second important reason why rural migrants concentrate in the villages is that their relatives or tongxiang fellows (people from the same village or town) live and work there. Social network and reciprocity are crucial to migrants' daily lives, e-commerce businesses, and the formation of new migrant elites and entrepreneurs. As indicated by Boost and Oosterlynck (2016), social networks provide migrants with emotion, information and instrumental supports. The survey illustrates that rural migrants in Taobao villages use social networks to exchange resources

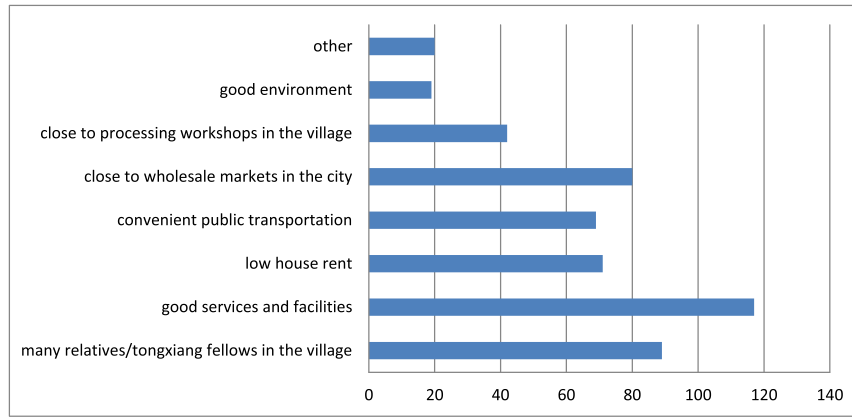


Fig. 5. The reasons why migrants concentrate in the villages for e-commerce businesses.

for daily lives, and get information and advices from their tongxiang fellows about how to open and manage online shops, where to buy goods, and how to communicate with online shoppers. They live closely to each other in order to facilitate various forms of exchange. Spatial proximity can facilitate social networks and reciprocity.

The in-depth interview with Mr. L, who is a leader of a group of migrants in Lirendong village, shows how rural migrants use social networks for e-commerce businesses and how migrant elites and entrepreneurs emerge. He came from a town in Chaoshan (Teochew), which is a unique region with specific culture, dialect and cuisine in China. He stated that:

“I firstly came to work in the village in 2008. At that time, the road network of the new village was planned, but only a quarter of the new village was under construction. The village was very quiet. I then brought dozens of my relatives to work in the village. I taught my relatives to start their online shops. After that, many people from my hometown came to work here. We helped each other for both jobs and daily lives. We ate together and chatted in the evening, so we could exchange information.”

Mr. L also told me that at the beginning, he worked very hard as an e-tailer of Taobao.com, but the income from e-commerce businesses

was much higher than that of manufacturing jobs. A few years later, he earned his first pot of gold and recently established his own e-commerce company. His company is a supply and demand platform for e-tailers (of Taobao, Alibaba, Ebay and others) and physical store retailers. The company is becoming one of influential innovative firms in Guangzhou. It has more than 20 employees, many of whom came from his hometown and other areas in the same region. The story of Mr. L illustrates the important role of social networks and translocal networks of migrants in facilitating the development of e-commerce, the emergence of migrant entrepreneurs, and the transformation of Taobao villages.

Although Mr. L is not a villager of the village, he has de facto become a “leader” of the village. Due to his achievement in e-commerce business, he is often interviewed by the media and becomes a representative of the village to meet officials of district and municipal governments. As a result, village leaders of the collective organization who once ignored or gave trouble to him now are respecting him and providing supports for his company. This suggests that e-commerce has reframed power relations between migrant elites, villager leaders and local governments.



Fig. 6. A migrant is simultaneously using three computers to operate his online shops (author's photography).

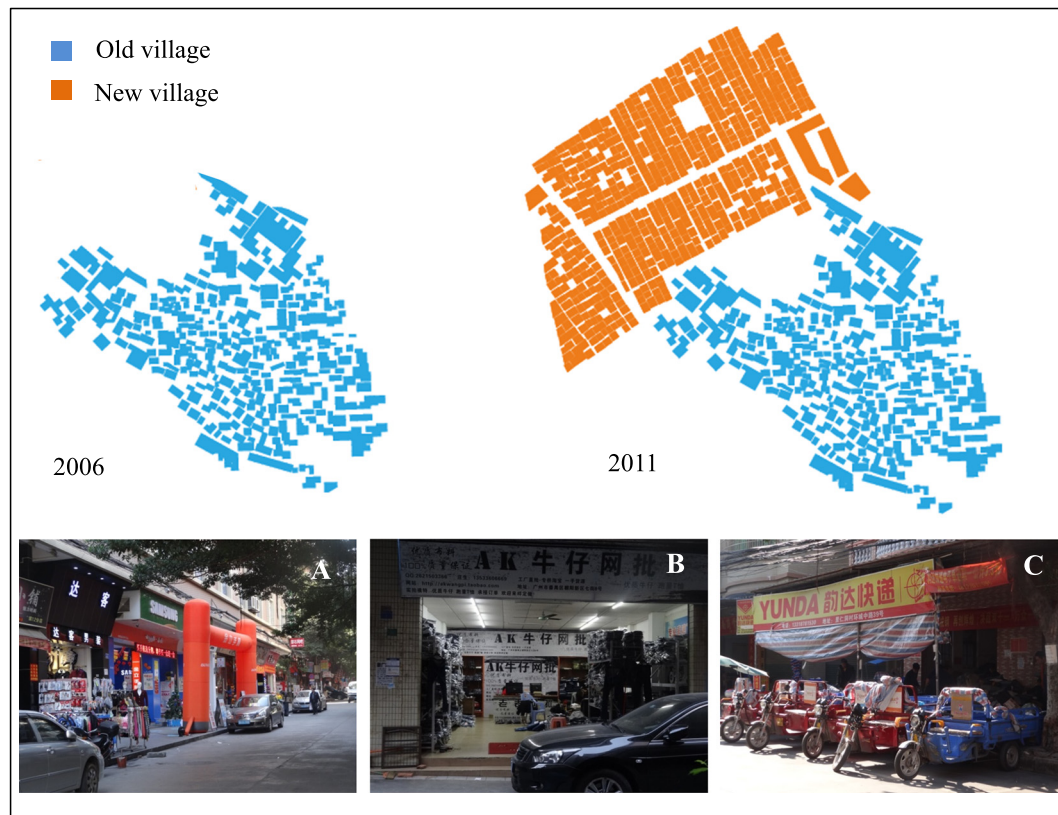


Fig. 7. Spatial transformation of Lirendong village. A: shops along the main street; B: a small garment processing workshop for online shops; C: a small express delivery company (author's mapping and photography).

5.3. E-commerce, collective land and spatial changes

The formation of Taobao villages are influenced by a number of spatial factors (e.g. location, proximity, clustering). The role of geography clustering in the growth of enterprises has traditionally been the focus of a range of economists and geographers (e.g. Marshall, 1920; Mercedes, Michael, & Scott, 2011). Agglomerations can reduce the transaction costs and improve the flow of information (Porter, 1998). They can lead to demand and supply conditions that are better in a cluster than in isolation, promoting the growth of incumbent firms as well as attracting the entry of new firms (Pandit, Cook, & Swam, 2001). Geographical clustering of e-tailers with a village has competitive advantages and economic effects (Guo et al., 2014).

The results of questionnaires suggest that several spatial factors influence the decision of migrants to choose these villages for e-commerce businesses (Fig. 5). These villages are often located at the urban fringe where land is cheap, but they have a close proximity to wholesale markets in urban areas and there is convenient public transportation inside or outside the villages. Therefore, rural migrants can buy goods in the wholesale markets by bus within a short time. The proximity reduces transportation costs (time and money). For instance, Xi'niujiao village is not far away from Shahe Clothing Wholesale Market, which is one of the biggest clothing wholesale markets in Guangzhou. Yushatan village is close to Yongfu Auto Parts Wholesale Market. As a migrant said, "I chose to live in this village, because it is nearby the auto parts wholesale market. It only takes me about half hour to the market by bus" (Interview on December 2015). Another important factor is low house rent. Collective land of the villages is much cheaper than urban land. Villagers also built their houses in a low cost way and do not need to pay taxes of their properties. Therefore, rural migrants can rent a cheap house unit (e.g. a room or a small apartment of a villager house) in Taobao villages for living and working.

A complex spatial transformation has often occurred in the villages

in order to accommodate new forms of production and consumption. Lirendong village is a good example to show how a traditional village transforms into a Taobao village. The interviews with villagers and migrants show that since 1989, farmland of the village has requisitioned by the city government for real estate development. The village committee then planned a new village right next to the original old village in order to meet the increasing living demand of villagers. In the 1990s, there was almost no limited internet access in the village. In the 2000s, Lirendong village attracted a large number of migrants engaged in the garment processing industry, due to cheap housing and newly built roads in the surrounding urban areas connecting the village with several clothing wholesale markets. This industrial development laid the foundation for e-commerce growth at the later stage. During this period, there was also a great improvement of infrastructure (e.g. roads, water pipes, electronic power lines) and internet access. In 2008, the internet penetration rate in Guangdong province reached about 50% which was much higher than the average rate in China (Chen, 2009), and there were more than 4 million internet users in Guangzhou (Han, 2008). The improvement of infrastructure and internet access as well as an increase in internet users have provided opportunities for e-commerce development, driving a new type of socio-spatial and economic transformation in Lirendong village.

Since 2008, the new village of Lirendong has attracted a large number of e-tailers, becoming one of the largest e-commerce gathering place in Guangzhou. These e-tailers are mainly involved in clothing businesses. They buy clothes from the garment processing workshops in the villages or the clothing wholesale markets in urban areas. The new village has been built in a more regular form in order to meet the production and consumption demand of e-commerce businesses. The road network is neat and streets are wider than that of the old village (Fig. 8), so trucks and motorbikes can access to express delivery centres and to villagers' houses to pick up the goods. My observation during the two periods of fieldwork in 2015 and 2016 showed that a lot of e-

commerce services and facilities such as photo studio, training organizations, express delivery centres, and shops, were concentrated along the main streets. Two or three village houses (with 5–7 floors) were often built together, in order to enlarge the space of the ground floor, which was used for shops, small processing workshops and service sectors (Fig. 7). Besides wholesale markets in the nearby urban areas, small processing workshops or factories in the village also provided goods for online shops. Many villagers lived in one floor of the house and divided other floors into several small apartments renting migrants for their living and working. An apartment often had 2–3 small rooms. Migrants used the living room for working and other rooms for sleeping and storage. Some of the migrants worked in the processing workshop on the ground floor during the daytime and slept in their rooms or apartments on the other floors. Therefore, one can argue that to some extent e-commerce has affected the spatial layout and housing types in Lirendong villages. On the one hand, the new layout is more regular and modern in order to accommodate the new form of production and consumption. On the other hand, villager's house is designed to combine working and living functions to meet the need of e-tailers or online entrepreneurs.

During my fieldwork, I also observed that rural migrants often concentrated in certain areas of the villages. These areas were often the new parts of the villages, where there were newer and bigger houses and roads. In-depth interviews with a number of migrants showed that migrants collaborated with villagers to build a large number of houses in the new village. For instance, villagers firstly built a four-storey house, while migrants bought the roof and added four more storeys to the house. In some cases, migrants directly bought villagers' housing plots and constructed houses themselves. However, this form of collaboration is relatively informal. According to the regulation, each village household has a piece of land for residential use, but cannot sell the housing plot and properties above it in the market. Therefore, the contracts between villagers and migrants are illegal and the houses is the so-called “Small Property Rights Housing”.

6. Discussion

In China, e-commerce has become one of the key paths to absorb rural surplus labour (Lü, 2015). Rural areas where cheap land and labour are available have become the incubator of e-commerce and central to the circulation of capital. The emergence of numerous Taobao villages in China has gradually changed the traditional economic model in rural areas, resulting in a transition from an agricultural to an industrial and information society (Alibaba Group, 2015). While the existing literature on Taobao villages has mainly attuned to rural areas, this study focuses on the formation of Taobao villages in the city by taking Guangzhou as an example. It shows three crucial layers in the formation of Taobao villages, namely of ICT infrastructure and production networks, social networks and power relations, and urban form and land use. These three layers are interwoven with each other.

First, the layer of ICT infrastructure and production networks provides a foundation for e-commerce growth and the formation of Taobao villages. The recent development of ICT infrastructure in both urban and rural areas in China has largely contributed to e-commerce growth. In Guangzhou, Taobao villages have good ICT infrastructure such as broadband networks and Wi-Fi, so e-tailers can access to the Internet and social media by using their smartphones and computers to operate their online shops. Social media, smartphones and other online platforms have not only been important components of ICT infrastructure and production networks, but also provided a new platform for migrants' networking and information exchange. This suggests there is an interaction between ICT infrastructure and social networks. Besides, online retail is supported by offline retail and services, which is comprised of a large number of wholesale markets in the city, the industrial sector, an effective logistics system, and low cost services in Taobao villages. Since geographical settings and spatial features are crucial to

the development of offline retail and the provision of services, the production and consumption network thus has a spatial dimension.

Second, this study demonstrates the importance of social networks of rural migrants as sources of social capital in the formation of Taobao villages in the city. Based on two Taobao towns in Jiangsu province, Zhou and Liu (2018) point out that social capital of villagers, market environment, and operating conditions are three key factors for the formation of Taobao villages in rural areas. They mention two types of social capital, including the Chinese traditional acquaintance relationship network (built on clans and families) and e-commerce self-organizations. This study illustrates that a translocal network between Taobao villages and migrants' hometowns is important to the transformation of Taobao villages in the city. Rural migrants use social networks to get supports from their tongxiang fellows for working and living. Migrant elites play a crucial role in maintaining and expanding these networks and using the networks to get employees from their hometowns. They help their townxiang fellows to establish online or offline shops in the villages. To some extent, social networks of migrants facilitates the development of the production and consumption network that contains online shops and low cost service systems in Taobao villages. The social and economic production of space has also led to emerging migrant power and leadership, changing power relations.

Third, the existing physical forms provide opportunities for the development of e-commerce, which in turn reshapes them. There are complex relations between socio-economic factors and spatial transformation. On the one hand, Taobao villages are often in a close proximity to the wholesale markets in urban areas and have good access to public transport. The proximity and accessibility reduce transportation costs. In this sense, the layer of urban form and land use is interacted with the layer of infrastructure and production networks that contains road networks and wholesale systems. On the other hand, the cheap collective land and housing have attracted a large number of rural migrants to live and work there. Rural migrants have also informally collaborated with villagers in housing construction and land development, reshaping physical forms in the villages. New buildings and streets are constructed to meet the demand of new modes of production and consumption.

The study also reflects a number of issues that impede the future development of Taobao villages in Guangzhou. In the questionnaire survey, multi-choice questions were designed to understand migrants' opinions on the improvement of facilities and services in order to promote the further development of e-commerce in the villages. The results show that rural migrants concern on the improvement of the road network, public transportation, sanitation, migrant children's education, and government supports for migrants' e-commerce activities (Fig. 8). First, village roads become overcrowding with an increase of population and vehicles (including a number of small vehicles for delivering express). Second, rural migrants often go to wholesale markets in the surrounding urban areas by bus. With the flow of migrants into the villages, there are often not enough bus lines or bus stops inside and near the villages. Third, there is an issue of sanitation, which requires effective management and services from the village organization. Fourth, the education of migrant children is a big problem. Without urban hukou, migrants often cannot access to public schools in the city and village schools, unless they pay additional fees. Consequently, most of migrant children go back to their hometowns for education or study in private migrant children schools. Fifth, the survey show that there is a need to improve e-commerce related facilities and services, such as the establishment of large-scale photo studio, financial institutions, express centres, and community websites.

As shown in the results of the questionnaire survey, the supports from local governments are important for the further development of Taobao villages. The initial development of Taobao villages is often spontaneous, with few supports from the government. When they become well-known, they may attract attention from the local

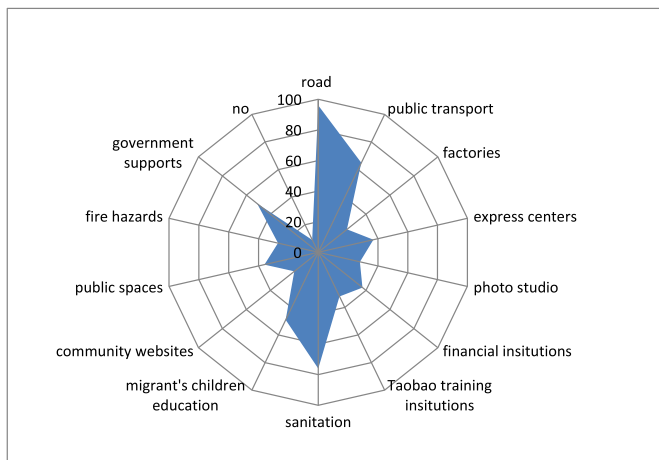


Fig. 8. Migrant's opinions on the improvement of facilities and services.

government and get more or less supports. According to the research of Alibaba Group (2015), local governments play an important role in supporting the further development of e-commerce in Taobao villages. When Taobao villages reaches a certain level of development, they may encounter issues such as land shortage, transportation problems, inadequate job training and insufficient facilities. In such a context, the supports from local governments are essential for their further development. For instance, in order to solve the problems of land shortages and other practical issues, the town government and village organizations in Shaji town established the E-commerce Industrial Development Office and the E-commerce Business Industrial Garden, and collaborated with local universities for e-tailer training (Alibaba Group, 2015). Local governments could help to deal with the bottleneck problems of Taobao villages and to upgrade the industrial cluster. The empirical works in Guangzhou reflects that the issues of transportation and inadequate facilities and services are complex and difficult for the villages to solve themselves. There is a need for the collaboration between the city government and the village organization to deal with these issues and integrate urban development and village development.

7. Conclusion

The rapid growth of e-commerce in China is largely attributed to an increase in the internet penetration rate and the widespread use of smartphones and social media in recent years. The social features of Taobao seller and shopper apps also make the communication and interaction between sellers and shoppers and the sharing information between shoppers much easily. These facilitate the rapid development of Taobao and the emergence of thousands of Taobao villages in China. Furthermore, ICT infrastructure becomes a part of the production network, since online shops are operated through mobile apps and websites. However, not all villages or villages in the city can become Taobao villages. Offline retail, service systems and their geographical settings are also crucial to the development of e-commerce. These refer to the proximity to wholesale markets and production areas and the accessibility of public transport in urban areas. These also include an effective logistics system and cheap services that rely on cheap collective land and cheap migrant labour in Taobao villages.

Young migrants play a crucial role in e-commerce development and the formation of Taobao villages. Different from old migrants who are often low skilled, most of young migrants received good education and have Internet skills. They use social networks to learn to establish online shops and some of them even become migrant entrepreneurs. The changes in economic status also lead to new power relations between migrants, villagers and local governments. One may argue that it is not so different from migrant economy in other contexts, since social

networks provide supports for migrants' employment and promote social mobility. However, it should be noted that the success of these migrants is not only attributed to their social networks, but also due to their capacity to learn the new skills. Besides, social networks of rural migrants can now be established and strengthened through social media and the Internet.

It goes without saying that e-commerce and migration has dramatically affected the formation and transformation of Taobao villages. E-commerce provides new economic opportunities for rural migrants, who were previously labelled as low-income and marginalized social groups in the city. However, this bottom-up urbanism has encountered several issues. There is a need to upgrade existing facilities and services in order to meet the demand of e-commerce growth. From a geographical perspective, Taobao villages can be viewed as the clustering of e-commerce and e-tailers in a certain region, and the resulting rise of agglomeration calls for further investment to provide necessary infrastructure and facilities. New partnerships between local governments, villagers and migrants are properly required to upgrade these infrastructure and facilities for and promote integrated development.

The growth of e-commerce and the flow of migrants have driven new forms of urban development. More research is needed to understand the impact of e-commerce and migration on urbanism, especially in those cities that are experiencing rapid social, economic, spatial and technical changes. However, the empirical analysis of this research is mainly limited to three case studies in Guangzhou. Further research is required to test the usefulness and validity of this proposed framework in other urban settings, and examine the interaction of the three layers. Since there is an increasing competition between traditional and online retailers, attention should also be paid to new forms of urban inequality and new planning approaches to deal with these challenges.

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