Sustainable Cities and Society 43 (2018) 578–586

Contents lists available at ScienceDirect

Sustainable Cities and Society

journal homepage: www.elsevier.com/locate/scs

The complexity of high-density neighbourhood development in China: Intensification, deregulation and social sustainability challenges

Yu Wang[a,*], David Shaw[b]

[a] Urban Studies, School of Social and Political Sciences, University of Glasgow, 25 Bute Gardens, Glasgow, G12 8RS, UK
[b] Geography and Planning, School of Environmental Sciences, University of Liverpool, Roxby Building, 74 Bedford Street South, Liverpool, L69 7ZT, UK

ARTICLE INFO

Keywords:
Social sustainability
High-density urban form
Neighbourhood development
Planning regulation

ABSTRACT

There have been wide ranging and ongoing debates regarding the relative advantages and disadvantages of high-density development for the context of social sustainability. However, little of this discussion has focused on the high-density small-scale development (HDSS), which has emerged as the typical urban form in many large Chinese cities. This paper examines the processes that shape the HDSS neighbourhood and the subsequent social consequences of this development. Document analysis and interview methods were used in a case study of neighbourhood development in the city of Shenzhen. Revealing the trade-offs behind the development of these neighbourhoods, the result reflects the varied roles and interests of different stakeholders and highlights how inadequate consideration is given to the social dimensions of sustainability in contemporary high-density small-scale urban development in China. This is now becoming a great challenge for both the Chinese city and society.

1. Introduction

Creating sustainable urban form has been accepted as a key global challenge for both researchers and planners (Arundel & Ronald, 2017; Jabareen, 2006; Liu, Song, & Arp, 2012). It is often argued that the design of urban form can be an important way to build a sustainable urban environment and have significant impacts on residents quality of life and wellbeing (Dempsey, 2008). Urban planning policies in many Western cities have placed an increasing emphasis on reducing a sprawling form, promoting a more compact form by increasing density and using more pedestrian-friendly urban design to encourage more social interaction (Bamford, 2009; Gordon & Vipond, 2005). The residents themselves, through their individual and collective activities and rituals, could also create a positive socio-spatial reinforcing sense of place (Friedmann & Chen, 2009). There is substantial evidence of the positive influences that well designed, high-quality and well maintained public realm and open spaces can have for neighbourhood wellbeing (Dave, 2009). Whilst high density development in many Asian economies and China in particular is seen as a rational approach to reconcile balancing the needs of land scarcity and population growth (Bardhan, Kurisu, & Hanaki, 2015; Zhu, 2012; Shen, 2017), often justified by Western arguments that this is the most sustainable urban form, there is a growing concern that high-density in China is leading to unintended and unanticipated negative social consequences.

It is well accepted that sustainability can only be achieved through a balance between all three dimensions, environment, economy and society (Jones & Evans, 2008; McDonald, 1996; Roseland, 2000) and social sustainability should undoubtedly be an important perspective for urban planners (Magis, 2010; Roseland, 2000). However, social sustainability itself is a vague and contested notion, with relevant discussions often being at two levels (Dempsey, Bramley, Power, & Brown, 2011). From an individual perspective research mainly focuses on quality of life and access to facilities or public spaces. From a community perspective, social interaction and social cohesion are also commonly highlighted as important aspects of social sustainability. These debates are having profound effects on the creation of urban form. Increasingly, commentators are questioning whether different types of urban form can be considered more or less sustainable, especially when linked to ideas of compactness (Chen, Jia, & Lau, 2008; Jabareen, 2006). However, even from a Western perspective, exploration of the relationship between urban form and social sustainability remains contested (Coppola, Papa, Angiello, & Carpentieri, 2014; Gatrell, Jensen, Patterson, Hoalst-Pullen, & Springerlink, 2016; Westerink-Petersen et al., 2013). The development of sustainable city and neighbourhood cannot simply be based on technical regulations but should also be concerned with the real social consequences of the development. This can be best achieved through the ongoing participation of different stakeholders throughout the entire development process. As

* Corresponding author.
E-mail addresses: Yu.Wang@glasgow.ac.uk, rainky420@163.com (Y. Wang), David.Shaw@liverpool.ac.uk (D. Shaw).

https://doi.org/10.1016/j.scs.2018.08.024
Received 2 March 2018; Received in revised form 13 July 2018; Accepted 17 August 2018
Available online 18 August 2018

Healey has suggested, a collaborative planning approach to create the 'good city' requires attention to be paid to both the qualities of 'place' and of 'process' ensuring that all stakeholders participate in the development debate (Healey, 2003, p.116).

Encouraged by 'compact city' thinking which has gained increasing acceptance in China (Peng, 2008), high-density urban form has been frequently argued as providing a model for the rational use of the limited urban land. However, a compact city should not be at the expense of the environment, nor should it compromise the quality of life (Geng, 2008). At present, however, there is a lack of clarity from the literature, and supporting empirical case study evidence as to what extent the real social consequences of Chinese cities' highly intensified urban environment are. The focus of this paper is to explore the social outcomes that have been contingent upon the planning and development process of high-density small-scale neighbourhood in modern China, which has come to characterise so much of the current urban form. The key questions asked in this paper include: What are the planning processes that lead to high-density small-scale neighbourhood development? What are the advantages and weaknesses of the current development mode? What are the social consequences of the development form? We begin by exploring the way that high-density neighbourhood is planned and developed in China, before turning our attention to an empirical study exploring the experienced social outcomes from this form of development.

2. Rethinking the social sustainability of high-density neighbourhoods in China

2.1. The contested high-density approach and its social impact

From a macro perspective, China's recent urban expansion and intensification have been intrinsically driven by the state policy (Yu, Wu, Zheng, Zhang, & Shen, 2014). The drive to promote the urban economy has led to a concentration of population in cities, especially as rural migrants flock to the urban areas seeking new job opportunities. Most Chinese local governments and planners have endorsed a compact city approach with associated high-density urban environment. Indeed, at the city level this is often regarded as being the most 'sustainable' choice because of limited availability of urban land combined with the intensity of local growth pressures. Furthermore, high-density urban form often helps to create an efficient public transport system and enhances the mixed use of urban spaces (Chen, Liu, & Lu, 2016; Shi & Yang, 2015).

However, more recently there is a growing worry that this policy impetus has led to super compactness, overcrowding and liveability challenges (Chen et al., 2016; Geng, 2008; Peng, 2008). Positive environmental efficiency generated by a compact urban form is evident to a certain level, and thereafter, negative consequences may become more apparent (Chen et al., 2008, 2016). Extreme intensification of the development pattern is being associated with an increase in the social burden because of the scarcity of supporting amenities and space, particularly within an enclosed environment. Nevertheless, and often neglected by scholars, the intensifying of space is a consequence of the state-led development processes, which largely pursue economic goals through urban development (Ma, 2004). In addition, the entrepreneurial nature of Chinese local government has demonstrated an instinct to promote urban development that increases the income they can receive from the urban land (Shen & Wu, 2013; Wang, 2014). Since the late 1990s, contemporary urban development in Chinese cities has been a process that enables local government to gain significant profits from commodity housing and the related charges on the lease of state-owned land. This results in increased fragmentation of urban land and higher density development as both can bring higher income to local government.

2.2. The creation of high-density form in China

In recent decades, the experience of developing high-density urban form in China, especially for the residential function, has been led by detailed regulations shaped by the interactions between key variables used in the planning and development processes (Tian & Shen, 2011). In this paper, we first aim to understand how the urban form is being managed through the Chinese planning system. The identification of the key variables that shape the urban form is from a review of China's hierarchical planning structure. A regulatory plan in China is a technical plan that determines the future shape of urban blocks through predetermining detailed spatial controls. The land-use purpose of urban blocks is determined at this stage, as are the external and internal road networks. Then controlling indexes are determined by the local planning bureaus, as key guidelines for site development (Cao & Wong, 2006). These indexes include site boundaries, floor area ratio, built-up area, greening ratio and so on. Thus, a regulatory plan controls the main capacity of the site and intensity of urban development. A detailed site plan is then used to highlight and understand detailed development proposals either for a specific site or across the whole urban block (Wu & Li, 2010). This then provides the context within which detail neighbourhood design work will take place. After these design proposals are submitted by the developers and subsequently approved by the local planning bureaus, a statutory site plan will be created. This will include the exact coordinates for each road, the layouts of the buildings, the space requirements for public amenities and a detailed design for the public and green spaces. Only then, will the actually planned contents and information for the site be published, and made accessible to the public.

As a special characteristic of urban form, and prescribed in various plans, density refers to the number of persons, households or dwellings per unit of land (Boyko & Cooper, 2011). In China, density is a key controlling variable for urban development. The Floor Area Ratio (FAR), also named as 'Plot Ratio', is critical in understanding the Chinese system of regulating development (Sun, 2009). It is calculated as a ratio of the total built-up floor area to the total site area. Thus, the FAR can represent the intensity of construction on a specific site. The site scale of development, also known as the variable 'plot area' in planning practice, is another key variable that also greatly influences urban form in China. It is also related to density, as density is not meaningful until the territory for measurement is defined (Dovey & Pafka, 2014) and the calculation of FAR (floor area/site area) also has to be area based. Because most new neighbourhoods in Chinese cities are characterised by an enclosed pattern, neighbourhood development takes place within clearly defined physical boundaries.

There have been many debates about the sustainability of high-density urban form in China (Chen, Yue, Qun, & Dene, 2015; Wang & Yang, 2011; Yang & Chen, 2005). Initially Chinese planners exhibited a cautious attitude towards high-density development. The Ministry of Construction and Housing Development published national planning standards that suggested that neighbourhood developments with a FAR of over 3.5 should be considered as 'inappropriate' particularly with regards the liveability criteria for a residential environment (Ministry of Construction, 1993, 2002). Additionally, the building coverage ratio (BCR) should not exceed 22%, so that sufficient green and public spaces could be provided to the residents. However, whilst these national standards have been set for many years, in practice, these have been locally re-interpreted during the recent and rapid urbanisation processes. The above technical discussions expose some potential disadvantages being associated with a high-density development pattern. The negative impacts of high-density are often linked with overcrowding and, over time, a decline in the quality of the local environment, both from a social and physical perspective (Churchman, 1999; Yang, Shen, Shen, & He, 2012). Geng (2008) has argued that new higher density urban development has led to a relative loss of public amenities, because residents of Chinese neighbourhoods increasingly

have to share amenities which have notionally been allocated for a larger urban area (urban block). Furthermore, the more intensive use of facilities, combined with a lack of management and maintenance, often leads to further deterioration in service provision. Such experiences are becoming more serious when the property development process has less consideration of the provision of public facilities. Furthermore, despite the close proximity of a large number of people, some studies are reporting that a lack of social contact can also be a problem of high-density neighbourhoods (Chen et al., 2008; Yip, 2012). Consequently, a sense of community and social cohesion is often lacking, which many residents feel needs to be addressed (Bretherton & Pleace, 2008; Wang & Yang, 2011; Yang, 1999).

Two points emerge from the above discussions. First, density itself is not the only variable worthy of a special consideration. For neighbourhood development in China, high-density urban patterns are usually the consequence of an increase, or maintenance in the FAR that has been applied to smaller sites. Thus, a higher FAR, a smaller site or a combination of both can result in a high-density small-scale pattern (HDSS) of neighbourhood development. Secondly, despite nationally developed technical planning regulations have intended to create a robust urban form and included general sustainability considerations, social problems are increasingly occurring within many of high-density small-scale development in many Chinese cities. The negative consequences of such development has led to reduced liveability inside neighbourhoods, poor access to local facilities and a deterioration in perceived quality of life, especially for large single blocked buildings or small residential clusters (Chen, Zhang, & Liao, 2000; Ying, 2004). This direct increase in urban density and compactness reflects a lack of concern for social sustainability in neighbourhood development. Hence, it is important to explore, despite the national guidelines, what the real processes that lead to the construction of unsustainable high-density neighbourhoods are in practice.

3. Case study: the control and out of control of high-density development in Shenzhen

3.1. Case study methods

Our case study focuses on a particularly distinctive type of high-density small-scale urban neighbourhood in the city of Shenzhen (Fig. 1). Shenzhen, located in southern China currently with an urban population of over 11 million, has experienced extremely rapid development within a short, forty-year period. It has been catapulted from a small fishing town of some 30,000 inhabitants to China's fourth wealthiest city. The planning system in Shenzhen mirrors the national system, although within Shenzhen the term 'statutory planning' is used, in preference to the more common nationally used 'regulatory planning' (Fig. 2). The Shenzhen Planning Bureau (SPB), whose formal name is the 'Urban Planning and Land Resources Commission of Shenzhen Municipality', administers planning and land use regulations. Its subsidiary institution, the Shenzhen Urban and Land Resources Planning Research Centre (SPRC), supports the formulation of governmental plans. Officers in the SPB are responsible for city-level planning strategies. Planners in the SPRC are 'governmental planners' because of the technical support they provide to plan-making. The SPB largely operates at city level, issuing master plans and other special plans at this scale. Operationally the district branches of SPB determine the detailed plans and regulations for specific urban projects. These district branches should follow the directives of the SPB, fulfilling the requirements of a centralised planning administration at the more localised district level.

Fig. 1. The location of Shenzhen.

By looking for development projects which were small (under 1 ha) in combination with super high FARs (above 3.5), many high-density small-scale neighbourhood (HDSS) have been constructed in Shenzhen. There has been a considerable expansion in the number of extra-small (under 0.7 ha) developments in recent years. It accounted for 27.63% of all the neighbourhood developments across the city by year 2013. Two HDSS neighbourhoods in Shenzhen were selected for more detailed study (Table 1). Both are located in the Houhai area of Nanshan district, one of the most well-established living places in Shenzhen. Four different stakeholder groups were identified as having been involved, or having and interest, in the local neighbourhood development process. Representatives from each group were contacted and invited to participate in semi-structure interviews related to both the plan making process and the outcomes of high-density neighbourhood development. The first group represented governmental officials at the city scale: officers from the central SPB (interviewees A1) and the districts (interviewees A2, A3) were interviewed. The second group were public planners: one planner (interviewee B1) from the planning team of SPRC and a third-party planner (interviewee B2) from a local planning institution. The third group were property developers and property managers and included a senior manager of a local real estate developer (interviewee C1) and a representative from a property management company (interviewee C2) who was responsible for the management of one of the two neighbourhoods selected for study. Finally, resident's group concerned about social sustainability within the neighbourhood (interviewees D1–D3) were interviewed. Full ethical considerations were given in the design of the study with participation involvement requiring voluntary informed consent, an ability to withdraw for the interviews at any time and the promise of complete anonymity (hence the use of the codes identified above). In total ten individuals drawn from the four groups were interviewed, with each interview lasing between twenty and forty minutes depending on the availability of interviewees.

3.2. The creation of high-density pattern- review the technical route

Fig. 3 shows the planning stages that, in theory, control urban form. It is clear to see that the critical variables (site scale, FAR etc.) are shaped by a complex system of individual site-by-site decisions, not simply determined by one or two planners. Although the previously discussed variable density patterns, such as the HDSS, do, in theory exist, in practice they are not available to planners as multiple choices that can be easily adopted for neighbourhood development. Urban form is shaped as the process through a set of incremental decisions. In Shenzhen, the main urban form variables are controlled via a three-level hierarchy of regulations (Fig. 3). The 1st-level variable, site scale, is determined at the very beginning of the process through a land use plan. Its value is determined with reference to Shenzhen's Urban Planning Standards and Guidelines (SPSG). In the core areas of the city, it is normally in blocks of 1–2 hectares, but can be enlarged to 2–5

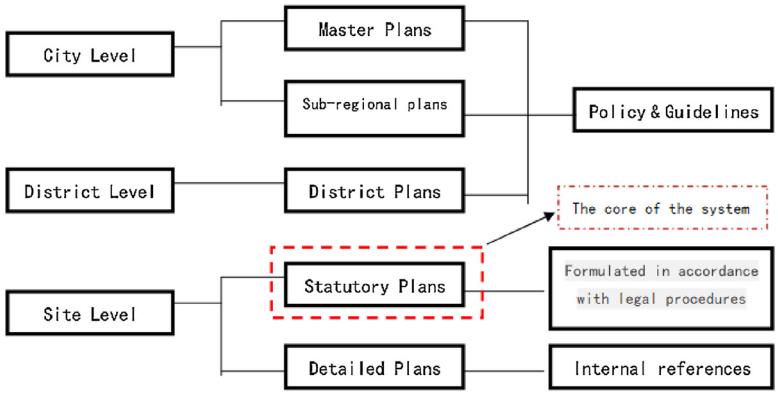

Fig. 2. The planning system in Shenzhen (Drawn by the author, according to Du, 2010).

hectares elsewhere. However, this determination only makes sense for new development plots. For existing areas, the scale of sites is usually pre-determined by site boundaries, which are largely unalterable. The 2nd-level variable, density is represented by the floor area ratio (FAR). The FAR is usually determined during the making of statutory plan for a specific area. But, it can be affected by many factors and often does not closely follow guidelines. For example, an increased FAR, especially near subway stations, is allowed, and indeed encouraged. A change in density can also be affected by variations in site scale and the application of a coefficient as indicated by the local regulations (see Table 2). The detailed planning and design then occurs and further 3rd level variables including the building coverage ratio (BCR) and the greening ratio (GR) are applied as indices which impose restrictions on the development for a specific site. Also, the BCR must be less than 25% for a site with any high-rise development (i.e. more than 10 floors), or less than 35% for low and medium rise developments (i.e. less than 10 floors). An overall 40% GR is also required for any neighbourhood project. Whilst not being able to exceed the limits, there is some flexibility in determining the detailed relationship between BCR, GR and the actual development, which is negotiated on a site-by-site basis. Designers and developers can also decide other variables that can affect the form of a neighbourhood but without formal restrictions. For instance, providing neighbourhood public space is encouraged by the SPSG, but there are no pre-determined guidelines where it should be located, nor on the proportion of the site that it should cover. The space for parking private vehicles inside a neighbourhood can also be varied significantly. Thus, the designers can shape the inner form of neighbourhoods in many diversified ways.

In practice, critical key control variables are also proposed for neighbourhood development and redevelopment. The Uplrc (2013) limits the maximum value of FAR to be 6.0 and the minimum site size to be at least 0.7 ha. Furthermore, urban regeneration policy requires neighbourhood redevelopment to take place at an appropriate scale (i.e. on sites above 1 ha) and that there should be a reduction in the building coverage ratio (BCR) in order to increase the proportion of public space as well as the greening ratio for any redevelopment sites (Uplrc, 2013). Despite these sustainability considerations, many developments have ignored these planning guidelines. For example, by 2013, at least 242 neighbourhoods had FAR exceeding 6.0 and over 700 neighbourhood projects had been developed on plots of less than 0.7 ha, which technically, at least according to the recent planning regulations could be regarded as 'not suitable for neighbourhood development' (Uplrc, 2013). Most of them were developed between the year 2000 and 2010. In this period, local-level regulations had not been effectively developed and there was less control on the massive development of urban neighbourhoods. Though the newest local-level planning regulations have started to review and reconsider the consequences of high-density neighbourhoods, policies, plans and regulations appear to be unclear regarding the creation of many high-density neighbourhoods in Shenzhen's past and current urbanisation trajectory. As a result, an introspection of the real neighbourhood development process, the relationship between stakeholders as well as powers of driving this type of development is as important as the aforementioned technical regulation points.

Table 1
The two super high-density neighbourhood cases in Shenzhen.

Neighbourhood Code	Households (hh)	Scale (ha)	Population Density (hh/ha)	Gross FAR	Built-up Year	Photograph
N1	224	0.3	764	8.2	2003	
N2	452	0.6	734	7.4	2002	

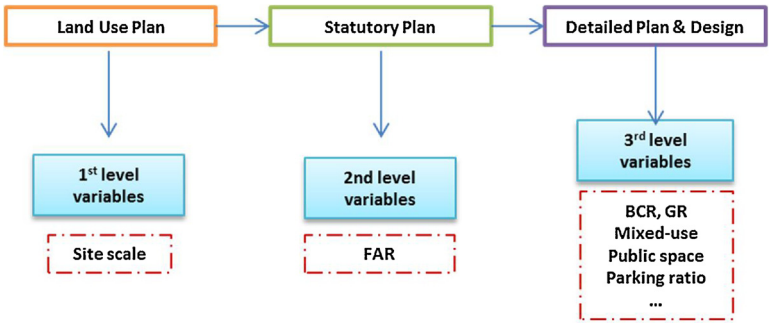

Fig. 3. The hierarchy of urban form variables from local planning procedure.

Table 2
The FAR's variation coefficient with site scale, applied only to the resident land use type.

Site-scale	< =0.7 ha	0.7–1 ha	1 ha	> 1 every increase of 1 ha
Coefficient of FAR Variation	−0.06	−0.03	0	−0.05

Note: it will be treated as 1 ha if an increase is less than 1 ha. Source: SPSG 2013 p.18.

3.3. The creation of high-density pattern- stakeholder perspectives

The case study highlighted a complex process that shaped high-density small-scale neighbourhood development, in which the role of planning, and nexus between urban compaction and sustainability, has resulted in significant challenges that are specific to the Chinese context. This complexity is reflected in the inter-relationships between stakeholders from the beginning to the end of the planning process. From the outset, the local planning bureau has to liaise with the neighbourhood developers and their consultants. It is during this stage that the site development details are negotiated, within the regulatory framework outlined above. The planning bureau will eventually approve a final proposal submitted by the developer. This becomes the blueprint for the development. As an urban neighbourhood nears completion and residents move in, new partnerships emerge focusing on whether the expected, perceived and anticipated built environment, space, facilities and services are being made available to the new residents. Collectively these are intended to facilitate neighbourhood cohesion. One of the key stakeholders thus becomes the residents, usually organised into resident committees who have discussions with property management teams and local community officers about their needs and aspirations on service provision. Increasingly conflicts are emerging and often there are different expectations between different stakeholders. This is an important scope to explore the real process of neighbourhood development and the determinants of its patterns.

3.3.1. Government's preference of small-scale development

The local government largely determines the development scale through the control of the plot size at the very beginning of its hierarchical planning process. Preferences for large or small scale were discussed with our interviewees. Interviewee B1 indicated how complexity existed in the determination of the development scale in practice. These experiences were drawn from their involvement of planning practice at both the city and neighbourhood levels.

> *'From one perspective, larger sites with a potentially considerable population can result in a better quality of neighbourhood management. I would agree from an academic point that a large-medium scale development can present the potential for the delivery of better social infrastructure than small scale developments. However, when considering urban transport, there is often a heated debate on the solution of large-scale site development. Public routes may be adversely affected if urban spaces are all consolidated into larger blocks by directly increasing site plot size. The connectivity of the main road network may be decreased. Hence, there may be some advantages associated with small scale development projects.'*

Another limitation of the large-scale site development model is the reality of urban land availability in Shenzhen. Planning officer A1 said that there was extremely limited housing land available in this city, and 'it may be not possible to provide large sites anymore in future' because 'land provision, now and in future, relies on urban regeneration and land re-development .....the majority of new housing development will be based on regeneration sites'. Thus, the implementation of a more idealised sustainable pattern could be further constrained by the practicality of the urban context.

3.3.2. High-density small-scale development is strengthened and extended by varied interests

In the neighbourhood development process, developers receive detailed requirements from the planning bureau in the form of a detailed notice document, *'The Conditions for Planning & Design Permission'* (CPDP). Detailed neighbourhood design, and the construction itself, must follow these CPDP instructions, although often there is scope for negotiation. Interviewee A2 explained how the CPDP works in practice:

> *'For each neighbourhood project, a CPDP document is issued by the appropriate district branch on behalf of the bureau. In it, the key variables are comprehensively specified, including the FAR, BCR, GR and parking space ratio. Many other conditions are also included in the CPDP. These shape the detailed design, including site boundaries and their draw-back distances from main roads. However, these variables and conditions are usually re-negotiated, one by one, depending on the specificities of the actual development.'*

The CPDP is one of most crucial documents produced by the planning bureau that should, in detail, regulate and guide urban projects. The final determination of each of these variables needs careful consideration and often, expert discussions are organised. Despite these regulations, the finally submitted and approved developer design proposals can still be organised in a flexible manner. Interviewee A3 explains how some regulations are applied in practice:

> *'For a neighbourhood project, the parking space ratio is flexible and occasionally the total built-up area may also be adjusted. However, the control on the FAR is restricted and the maximum BCR's and GR's cannot be exceeded.'*

Thus, some of the local regulations are often applied differentially, with adjustments possible for some variables during the actual design and approval of the site development process. Additional, FAR is not simply a technically derived index, but also represents a critical trade-off. As pointed out by planner B2,

> *'A substantially higher FAR might be approved, in exchange for a*

condition that additional public facilities, serving the wider neighbourhood, could be constructed during the site development process.'

Hence, if the developer would like to accept this type of 'offer', an increase in density is possible, despite the apparent inflexibility of the FAR in the local regulatory system. An increased FAR usually means additional profits, which, in return, can offset higher development/redevelopment costs, particularly in relation to the unanticipated costs due to requests for additional facilities in, or near the neighbourhood plot.

From a developer's perspective, whilst the inter-relationship between profit and investment cost is a critical consideration in site development, many large developers still think that creating neighbourhoods with a pleasant social character is of great importance. In terms of the responsibility for creating more sustainable communities, developers have suggested that planning regulations and policy needs to be written in a more collaborative manner, clearly defining the boundaries and duties of the government and developers. Interviewee C1, a manager from a large real-estate developer in Shenzhen, indicated that developers face great difficulties in terms of developing sustainable neighbourhoods.

'Inadequate land provision increases the great competition between developers who are faced with continuing and growing demands for housing. As the local bureau maintains a strong and dominant position in the dialogue concerning land provision and planning control, they can have high requirements for each site. For instance, sometimes they require us to provide additional supporting facilities together with the development of a neighbourhood. This will definitely increase the project costs for us……

More recently, the responsibility for the provision of public facilities within a neighbourhood development, that used to be the job of the local authority, is being transferred to us as the developers. We then have to increase the FAR in order to compensate for our additional development costs. In terms of project returns, powerful developers might pay attention to the brand-making and the social benefits of their projects, whereas smaller companies attach importance to their profits and cash flow efficiencies. Thus, delivering social responsibility may be less meaningful for these developers. And remember many development sites in the core city are now small.'

In our case studies, we found a lack of collaboration in the development process and indeed the interests of some important stakeholders were ignored. As a public policy instrument with significant consequences (Bao & Li, 2010; Sun, 2009), decision-making concerning the FAR on a particular site is crucial and should be determined in an open and transparent manner. However, the current opaque process increases the risk of potential 'power-money' deals (Chen, 2013). The planning bureau, which is dominant in the planning process, hopes to have each site developed quickly and links such developments to some other benefits, for example bringing many public facilities together within an overall single neighbourhood project thereby saving costs for the local government. The starting point of the bureau may be from the logic of entrepreneurial government, but as the nature of a developer is the pursuit of profit, any supplementary development requirements will be an added cost to any new residents.

3.3.3. Social outcome and issues

Whilst the proportion and, more importantly, the quality of public space should be developed as core planning controlling indices with their particular attributes clearly articulated and prescribed through the CPDP, and if necessary, remediation required for high-density small-site (HDSS) development where inner public space is limited, many residents expressed disappointment in the quality of public spaces provided. Furthermore, they thought that the creation of a good urban form should be a minimum expectation from professional urban planners (either governmental or private). Consequently, residents in these neighbourhoods felt disappointed by the outcomes of the planning and development process. An elderly resident (interviewee D1) from neighbourhood N2 explained that:

'Common rooms in this neighbourhood are small and often overcrowded. There are limited supporting spaces and services inside our small neighbourhood. We have to use external public facilities instead, such as the district elderly care centre. This frustrates us because the facilities are far from here.'

Interviewee D3 from neihgbourhood N1 said:

'For our neighbourhood, parking is extremely difficult because of limited space. The spaces for recreation and sport are also too small. My kid has to play on the podium roof. I think this is not interesting and even, unsafe. The neighbourhood seems to be poorly designed. I believe the planning department does not care about this at all… we moved to here because the good location and relatively cheap rents – although we are now considering moving again, for a better living place.'

Many of the opinions and concerns from the residents could be verified from site visits and observation (Figs. 4 and 5). Moreover, the quality of the management of neighbourhood facilities can also be influenced by urban form. Interview C2 explained that:

'The major responsibilities of our management team are security, parking control, maintenance and repair of inner public facilities including green spaces and providing other services to residents. Usually we are under the supervision of a residents' committee… We don't necessarily need to be connected with the developer, unless we are a subsidiary belonging to them. Many management agencies do not know developers at all, indeed often the developer no longer exists. For large-scale neighbourhood developments, the quality of management can often be good. However, in many small neighbourhoods, which characterises much of Shenzhen, management is often not good. This is, in part, a function of the lack of facilities being provided from the outset.'

Many small developers, who are often profit driven, often leave behind many problems once the development phase has been completed. For example, the management of spaces and facilities within a neighbourhood is left exclusively in the hands of property management agencies. Often there is a significant disconnect between the original developer and these management agencies.

Other residents have argued that they disliked the initial planning and design of the neighbourhood, describing the developer as having 'no social responsibility'. Interviewee D2 highlights some of the social challenges existing within his neighbourhood:

'Compared with nearby neighbourhoods we have a high and significant

Fig. 4. HDSS neighbourhood (N1) in Shenzhen with over 200 households.

Fig. 5. The outdoor sports facilities at the podium roof.

floating population. A considerable number of the original owners moved out because of the poor-quality living environment, especially for kids and the elderly. This has resulted in so many rental housing units. Some tenants are not willing to get involved in neighbourhood affairs. Furthermore, these issues are reflected in the housing price. We (and other residents) are disappointed because the price gap between our properties and other similar flats (not in a HDSS pattern) is increasing'.

The observed type of neighbourhood development, in the form of high-density small-scale development, which violates central government's planning guidelines and are in breach of the designated sustainable criteria, is still being implemented in practice. The approval of these proposals is often through a non-transparent planning process under the rubric of 'special discretion for each site'. Usually there is a lack of consideration for socially sustainable outcomes - albeit it should be explicitly considered, at least according to the regulations. This is characterised by a concealed dialogue between the bureau and developers, in which the debate is framed by mutual self-interest. An entrepreneurial, revenue raising local government combined with a profit-oriented market often determines neighbourhood development patterns with limited discussion of social sustainability issues.

4. Discussions

In both the Western world and China, there are often great trade-offs that need to be recognised when urban form is created, and re-created. The controversial actions and conflicts that have occurred in many neighbourhood developments suggest there are many challenges in promoting a more sustainable urban form. In our Chinese case, many high-density small-scale neighbourhood developments approved by the planning bureaus indeed violate the principles of social sustainability. Some essential form variables are not carefully considered and some are later amended, due to negotiations between the planning officer and the developer, without adequate consideration of the final users who cannot really be involved, because as prior any new urban development/redevelopment the community never really exists. It is, therefore, not surprising to find many unsustainable developments characterised by unusually high and overly dense projects.

The nexus between urban form and sustainability is increasingly emerging as an area for debate within literature. It is often argued that high-density development should be more sustainable, at least based on Western perspectives. However, this cannot really be confirmed within the Chinese context and indeed what the empirical study has suggested is that social sustainability principles may have been scarified in China's urban development. From an environmental perspective, the logic of high-density development in China follows the principle of land saving. Furthermore, high-density is also being argued to have benefit in reducing of car dependency and reinforcing public transport orientated development, because of the potential to concentrate urban population around public transport nodes (Tan, Xu, & Zhang, 2016). The built environment in Chinese cities is being reshaped by these leading logics. Finally, a local authority can also profit more from a very compact mode of development, because high-density small-site development is the easiest way to maximise urban intensity in practice. For developers, density is also the key preferred pattern of development as this minimises the risks and maximises their returns on investment. Another cost and risk calculation used by developers is the scale of a development. Developers, due to quicker construction processes and consequently a more rapid return on borrowing, easing cash flow issues, often prefer high-density small-scale sites. Indeed very few developers will attempt a large development site/project unless they are in a very strong and stable financial situation (Zhang & Fang, 2003). In our case study, interviewees (B1, B2 and C1) representative the government planner and developer have all indicated the smaller-scale higher-density has become practical options for them. It can be seen in many Chinese cities, the potential for a large site development model is constrained by the dual dilemmas of a developer's profit drive and a planning authority's predicament in terms of land availability. Hence, the opportunities and benefits for both the developer and local authority coincide around a high-density small-scale pattern of development.

Additionally, the development on a site is often further intensified following the government's requests for public facilities being provided by the private developer, for whom, as a compromise, higher-density development becomes a tangible bonus. This lack of attention to the needs of inhabitants who actually reside in these new development is creating clear tensions (Liu, Yin, & Ma, 2012). Thus, short-term expedient considerations are creating significant challenges for the planning process that should ideally be orientated towards long-term sustainability objectives. Moreover, it is not a simple matter of choosing more sustainable patterns of development, but there also needs to be a systematic improvement in the entire planning process. This analysis clearly shows how the vested interests of both the state and developers are leading to less satisfactory living conditions for the residents of these schemes. Moving forward if more socially sustainable new neighbourhood development is to be created then more effective controls on density and the design of the neighbourhood in relation to urban form attributes needs to be agreed from the outset.

Fig. 6 highlights the social sustainability problem we have identified during the current Chinese neighbourhood development process. In the process of planning, design, regulation and implementation, the planners and developers are in a strong position to determine outcomes, shaped by power and resources. The voices of individuals and communities who live in the resultant developments have not been considered. What has been often neglected in the urban development process is the expectations of residents with their neighbourhood living enviornment. Echoing the reflections of Jacobs (1961) on the American urban renewal experiences, whereby urban re-development enabled politicians and the real estate business to make significant gains, satisfied the planners and architects, but unfortunately the ordinal people suffered the consequences of inappropriately designed development. It would be a tragedy of planning if the social aspect of a neighbourhood was neglected. Regardless of the different urban contexts, the preceding discussion indicates that many Chinese cities may now be experiencing a similar dilemma to that experienced in the West half a century ago. Society is becoming increasingly fragmented and disconnected as a consequence of the rapid urban transformation.

5. Conclusion

This paper seeks to open a debate on the social consequences of high-density small-scale neighbourhood development, which have been

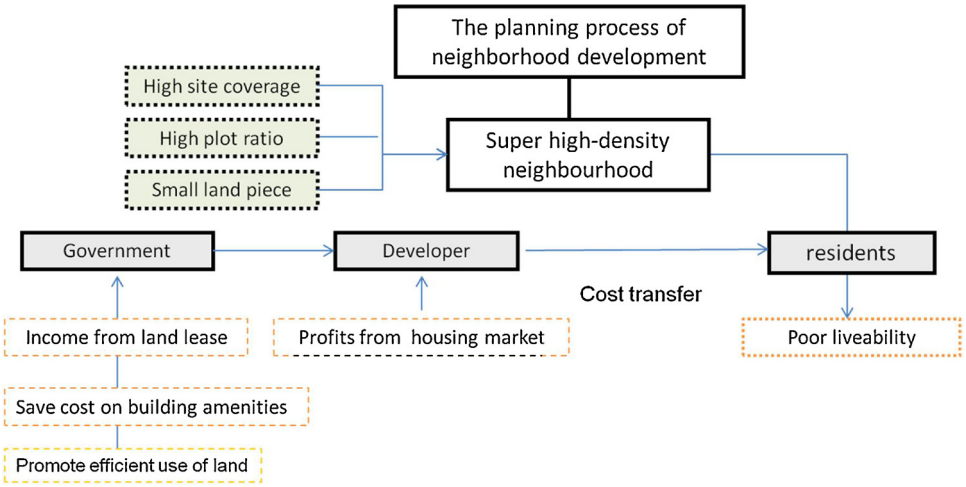

Fig. 6. The mechanisms that lead to unsustainable urban form through the Chinese high-density neighbourhood development process.

contingent on the actual planning processes in China. Whilst there have been some attempts to integrate social aspects into urban neighbourhood development; such efforts are extremely limited when compared to the environmental and economic dimensions of sustainability. Using Shenzhen as a case study, this paper has given a full explanation of how the planning system shapes urban form, with a particular emphasis on the local neighbourhood development process. In practice FAR is treated as a semi-flexible variable because the local planning bureau and its sub-branches have the 'discretion' to decide, for each project, what the FAR should be. In practice, planning regulations have been continually changed in particular local contexts. Moreover, with weak technical controls these are often ignored in many neighbourhood development projects. Chinese planning practices for residential development has been described as a spatial tool that creates 'dwelling spaces' (Zhao & Zhao, 2002). This needs to be transformed to a comprehensive approach that configures 'living places'.

Another question that the paper has explored is whether the planning processes, which have been instrumental in shaping urban form, have been appropriately updated to meet the essence of contemporary social sustainability criterion. This requires a systematic process incorporating high-levels of coordination and collaboration within the planning process. However, in contemporary modern China, at least from the Shenzhen case, over-development on urban sites is not uncommon, especially when developers and the local government co-operate to achieve what is mutually beneficial to each other's interests, normally increased land lease income and higher profits. Many new Chinese urban neighbourhoods have been developed without careful consideration of the need for balance during a time when rapid processes of urbanisation have been taking place. Currently, economic considerations and to a lesser extent environmental concerns are the two dominant priorities (Chen et al., 2008), whilst social development is still the weakest part of the sustainability triumvirate. The links between the spatial patterns of urban development, quality of space and consequent social satisfaction needs more attention. For neighbourhood development, a developer's actions are understandable as motivated by the opportunities to maximise their profits. However, this is just one aspect of urban growth. The excessive insistence on economic growth may become associated with increasing social instability as a consequence of rapid urbanisation (Sun, 2009). In China, the real problem for planning lies in the lack of a mature approach in coordinating varied interests and thereby developing good plans for all, so that more sustainable forms of neighbourhood development can be promoted. Moving forward decision-making processes should pay more attention to the social orientation of development trajectories, thereby seeking a long-term sustainable pathway for an urban future.

Acknowledgments

The production of this research paper is supported by the UK Economic and Social Research Council (Grant No. Es/N010981/1). The author would like to thank the two local neighbourhood committees for their generous support. The authors would like to express deep gratitude to the anonymous reviewers for their helpful comments.

Research data for this article. To protect respondent confidentiality, the raw data used in this paper would remain confidential.

References

Arundel, R., & Ronald, R. (2017). The role of urban form in sustainability of community: The case of Amsterdam. *Environment and Planning B: Urban Analytics and City Science, 44*, 33–53.
Bamford, G. (2009). Urban form and housing density, australian cities and european models: Copenhagen and Stockholm reconsidered. *Urban Policy and Research, 27*, 337–356.
Bao, Z., & Li, C. (2010). Progress on the study of urban architecture FAR. *Progress in Geography, 29*, 396–402 in Chinese.
Bardhan, R., Kurisu, K., & Hanaki, K. (2015). Does compact urban forms relate to good quality of life in high density cities of India? Case of Kolkata. *Cities, 48*, 55–65.
Boyko, C. T., & Cooper, R. (2011). Clarifying and re-conceptualising density. *Progress in Planning, 76*, 1–61.
Bretherton, J., & Pleace, N. (2008). *Report: Residents' views of new forms of high-density affordable living*Coventry, York: Chartered Institute of Housing/Joseph Rowntree Foundation.
Cao, S., & Wong, Y. (2006). Exploration on urban spatial form control in the regulatory plan. *City Planning Review, 30*, 45–48 in Chinese.
Chen, X. (2013). *Unspoken rules of the FAR profit-making in Shenzhen, the win-win deal between the local government and developers.* China Times.
Chen, H., Jia, B., & Lau, S. S. Y. (2008). Sustainable urban form for Chinese compact cities: Challenges of a rapid urbanized economy. *Habitat International, 32*, 28–40.
Chen, M., Liu, W., & Lu, D. (2016). Challenges and the way forward in China's new-type urbanization. *Land Use Policy, 55*, 334–339.
Chen, S. S., Yue, Y., Qun, G., & Dene, L. (2015). Quantifying circular urban expansion patterns of compact Chinese cities: The case of Yangtze River Delta, China. *Environment and Planning B: Planning & Design, 42*, 279–299.
Chen, Z., Zhang, Y., & Liao, Y. (2000). *Scattered residential land planning and management in Shenzhen Special Economic Zone Planners.* in Chinese66–69.
Churchman, A. (1999). Disentangling the concept of density. *Journal of Planning Literature, 13*, 389–411.
Coppola, P., Papa, E., Angiello, G., & Carpentieri, G. (2014). Urban form and sustainability: The case study of Rome. *Procedia – Social and Behavioral Sciences, 160*, 557–566.
Dave, S. (2009). Neighbourhood density and social sustainability in cities of developing countries. *Sustainable Development, 19*, 189–205.
Dempsey, N. (2008). Does quality of the built environment affect social cohesion? *Proceedings of the ICE – Urban Design and Planning, 161*, 105–114.
Dempsey, N., Bramley, G., Power, S., & Brown, C. (2011). The social dimension of sustainable development: Defining urban social sustainability. *Sustainable Development, 19*, 289–300.
Dovey, K., & Pafka, E. (2014). The urban density assemblage: Modelling multiple measures. *Urban Design International, 19*, 66–76.
Du, Y. (2010). *Ten years of Shenzhen's statutory plans urban planning forum, 186*, 104–108 in Chinese.

Friedmann, J., & Chen, F. (2009). Towards sustainable neighborhoods: The role of social planning in China — A case study of Ningbo, Zhejiang Province. *Urban Planning International, 24*, 16–24 in Chinese.
Gatrell, J. D., Jensen, R. R., Patterson, M., Hoalst-Pullen, N., & Springerlink (2016). *Urban sustainability: Policy and praxis.* Cham: Springer.
Geng, H. (2008). Compact without crowd: Application of compact city theory in china. *City Planning Review, 32*, 48–54 in Chinese.
Gordon, D., & Vipond, S. (2005). Gross density and new urbanism. *Journal of the American Planning Association, 71*, 41–54.
Healey, P. (2003). Collaborative planning in perspective. *Planning Theory, 2*, 101–123.
Jabareen, Y. R. (2006). Sustainable urban forms: Their typologies, models, and concepts. *Journal of Planning Education and Research, 26*, 38–52.
Jacobs, J. (1961). *The death and life of great American cities.* New York: Random House.
Jones, P., & Evans, J. (2008). *Urban regeneration in the UK: Theory and practice.* London: Sage.
Liu, Y., Song, Y., & Arp, H. P. (2012). Examination of the relationship between urban form and urban eco-efficiency in China. *Habitat International, 36*, 171–177.
Liu, Y., Yin, G., & Ma, L. J. C. (2012). Local state and administrative urbanization in post-reform China: A case study of Hebi City, Henan Province. *Cities, 29*, 107–117.
Ma, L. J. C. (2004). Economic reforms, urban spatial restructuring, and planning in China. *Progress in Planning, 61*, 237–260.
Magis, K. (2010). Community resilience: An indicator of social sustainability. *Society & Natural Resources, 23*, 401–416.
McDonald, G. T. (1996). Planning as sustainable development. *Journal of Planning Education and Research, 15*, 225–236.
Ministry of Construction, C. (1993). *The planning and design code for urban residential area.* Beijing: China Architecture & Building Press.
Ministry of Construction, C. (2002). *Revision of the planning and design code for urban residential area.* Beijing: China Architecture & Building Press.
Peng, H. (2008). Rethinking of compact city: Key issues in the application of compact city theory in China. *City Planning Review, 23*, 83–87 in Chinese.
Roseland, M. (2000). Sustainable community development: Integrating environmental, economic, and social objectives. *Progress in Planning, 54*, 73–132.
Shen, J., & Wu, F. (2013). Moving to the suburbs: Demand-side driving forces of suburban growth in China. *Environment & Planning A, 45*, 1823–1844.
Shi, B., & Yang, J. (2015). Scale, distribution, and pattern of mixed land use in central districts: A case study of Nanjing, China. *Habitat International, 46*, 166–177.
Sun, F. (2009). From technical rationality to policy attribute: Floor area ratio regulation in urban planning administration. *Planners, 33*, 32–38 in Chinese.
Tan, Y., Xu, H., & Zhang, X. (2016). Sustainable urbanization in China: A comprehensive literature review. *Cities, 55*, 82–93.
Tian, L., & Shen, T. (2011). Evaluation of plan implementation in the transitional China: A case of Guangzhou city master plan. *Cities, 28*, 11–27.
Uplrc, U. P. L. R. C., Municipality of Shenzhen (2013). *Shenzhen urban planning standards and guidelines.* Shenzhen.
Wang, L. (2014). Forging growth by governing the market in reform-era urban China. *Cities, 41*(Part B), 187–193.
Wang, S., & Yang, D. (2011). Review on compact city studies: A sound strategy towards sustainability? *Urban Planning Forum, 6*, 48–53.
Westerink-Petersen, J., Haase, D., Bauer, A., Ravetz, J., Jarrige, F., & Aalbers, C. B. E. M. (2013). Dealing with sustainability trade-offs of the compact city in peri-urban planning across European City Regions. *European Planning Studies, 21*, 473–497.
Wu, Z., & Li, D. (2010). *Urban planning theory.* Beijing: China Architecture & Building Press.
Yang, G. (1999). Analysis and discussion on the survey of living environment and social psychology of residents in high rise apartments in Shanghai. *Urban Planning Forum, 4*, 35–38.
Yang, S., & Chen, W. (2005). Study on reasonable density of residence. *City Planning Review, 29*, 72–76 in Chinese.
Yang, J., Shen, Q., Shen, J., & He, C. (2012). Transport impacts of clustered development in Beijing: Compact development versus overconcentration. *Urban Studies, 49*, 1315–1331.
Ying, L. (2004). A study on the present status of urban communities and public service facilities of Hangzhou. *Planners, 20*, 93–96 in Chinese.
Yip, N. M. (2012). Walled without gates: Gated communities in Shanghai. *Urban Geography, 33*, 221–236.
Yu, A. T. W., Wu, Y., Zheng, B., Zhang, X., & Shen, L. (2014). Identifying risk factors of urban-rural conflict in urbanization: A case of China. *Habitat International, 44*, 177–185.
Zhang, Y., & Fang, K. (2003). Politics of housing redevelopment in China: The rise and fall of the Ju'er Hutong project in inner-city Beijing. *Journal of Housing and the Built Environment, 18*, 75–87.
Zhao, W., & Zhao, M. (2002). Residential planning or community planning? *Urban Planning Forum, 142*, 68–72 in Chinese.
Zhu, J. (2012). Development of sustainable urban forms for high-density low-income Asian countries: The case of Vietnam: The institutional hindrance of the commons and anticommons. *Cities, 29*, 77–87.