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# Chapter 8

## Stakeholder Participation and Visualisation in Sustainable Urban Transformation



Xi Lu and Eckart Lange

**Abstract** Sustainable urban transformation calls for the inclusion of stakeholders in the planning process. Generally, visualisation can serve as a bridge to connect stakeholders with diverse backgrounds. It is widely assumed that stakeholder participation in China differs from elsewhere due to its unique historical, political and cultural context. However, hardly any systematic studies exist focussing on stakeholder participation in the contemporary Chinese planning process. This study takes a multiscale perspective investigating stakeholder participation and visualisation in the statutory planning process in the Pearl River Delta, China. Using the urban planning system as a structural framework, document analysis was conducted based on urban planning laws, regulations and rules across different planning levels and looking at participatory phase, participatory tools and visualisation media. The study provides impulses for improving stakeholder participation and visualisation in the Chinese sustainable urban transformation process.

**Keywords** Stakeholder participation · Visualisation · Pearl River Delta · Urban planning system

### 8.1 Introduction

By 2050, 70% of the global population are expected to live in urban areas (Un-Habitat 2012). Urbanisation and the increasing environmental degradation are threatening our quality of life. Therefore, introducing sustainability in the planning process is of

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utmost importance for future transformative changes (Amado et al. 2010). Sustainable urban transformation is a multi-dimensional process that can realise urban development through sustainable development goals (SDGs) (McCormick et al. 2013). Among these, effective stakeholder engagement is fundamental to attaining social and environmental sustainability since it ‘supports the development of strong, constructive and responsive relationships that contributes to sound project design and implementation’ (UNDP 2020, p. 3).

Since around the 1960s, the involvement of stakeholders in planning and decision-making processes has been articulated on a broader basis. The term ‘stakeholder’ refers to ‘any group or individual who can affect or is affected by the achievement of the organisation’s objectives’ (Freeman 2010, p. 46). As a critique of the synoptic planning at that time, Arnstein (1969) classified the ladder of stakeholder participation into three sets of rungs: non-participation (manipulation, therapy), tokenism (informing, consultation, placation) and citizen control (partnership, delegation, citizen control). In the past, planning and design were rather exclusively seen as a top-down mechanism, with stakeholders being only on the receiving end. However, this has long changed since bottom-up mechanisms have been introduced widely (Flyvbjerg 1998; Forester 1982; Habermas 1997; Healey 2003). Thus, planning has gradually evolved from a rational comprehensive process into one of collaborative communication.

Effective participation has been supported through a range of visualisation techniques. This approach is linked to the fact that human perception is dominated by the visual sense (Bruce et al. 2003). While in the 1960s, visualisation techniques were analogue only, meaning physical 3-D models, sketches and perspectives, later on, video and image manipulation became more widely used (Lange and Bishop 2005). Nowadays, through the widespread use of 3-D visualisation and animation, including real-time immersion and, more recently, mixed reality and augmented reality, from the technical side, more opportunities have become available (Gill and Lange 2015; Portman et al. 2015). This offers far more advanced possibilities to represent planning and design proposals than some decades ago. Visualisation, whether analogue or digital, is a tool that, in general, can be used in planning communication (Lu et al. 2021). The way in which it is used largely depends on the context and the willingness of the stakeholders to make the best use of it.

It is widely assumed that stakeholder participation in China differs from that of elsewhere due to China’s unique historical, political and cultural context (Enserink and Koppenjan 2007; Zhang et al. 2019). Upon establishing the Chinese nation in 1949, urban planning strategies were primarily shaped by the centrally planned system for socialist development and influenced by political movements (Chen 2015; Yeh et al. 2011). The reform and opening-up in the 1980s brought about political decentralisation and market-led urban initiatives. Yet, it also triggered increasing conflicts between different actors in land development (Gar-on Yeh and Wu 1999). The City Planning Law of the People’s Republic of China (1989) and Measures for Formulating City Planning (1991) were therefore formulated to function as a framework for the planning of municipalities, cities and towns. For the first time stakeholder participation was introduced in these legal documents (Hao 2007). It

is not until the Urban and Rural Planning Law of the People's Republic of China (URPL) (2008) that the method and operation of stakeholder participation became institutionalised. Since then, technical rules and guidance specifying the methods of stakeholder participation have been applied at different planning levels (Kai 2011). However, hardly any systematic studies exist focussing on stakeholder participation in contemporary Chinese planning.

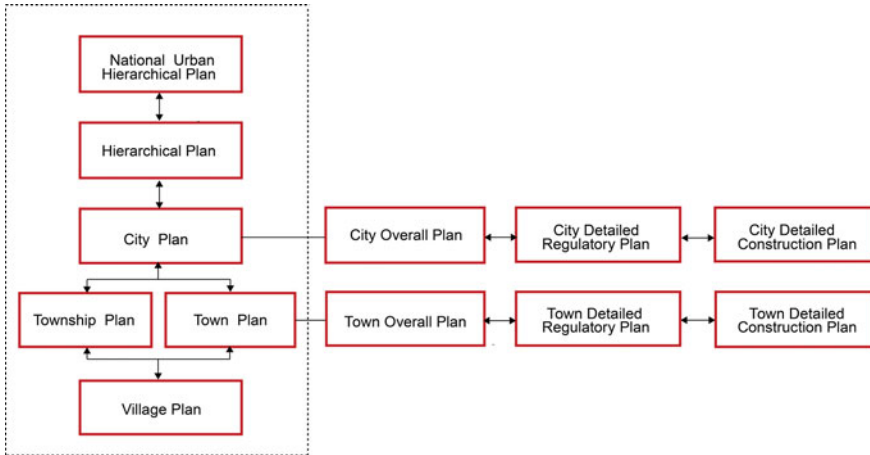
A sustainable urban transformation process needs to balance the pressures and expectations at different planning levels and the dynamics between the planning levels (Amado et al. 2010). Studies of visualisation tools in participatory planning have mainly focussed on the local scale; a multi-scalar approach to explore planning across different levels is still lacking (Pettit et al. 2012). Therefore, this study sets out to conduct a multiscale examination of stakeholder participation and visualisation in the Chinese urban planning process. It focuses on two questions: how stakeholder participation and visualisation work in the statutory planning process, and how effective they are.

## 8.2 Methods

### 8.2.1 Study Area and Urban Planning System

The Pearl River Delta (PRD) in the southern part of China covers nine cities ([https://en.wikipedia.org/wiki/Prefecture-level\\_city](https://en.wikipedia.org/wiki/Prefecture-level_city)) in Guangdong Province: Guangzhou (<https://en.wikipedia.org/wiki/Guangzhou>), Shenzhen (<https://en.wikipedia.org/wiki/Shenzhen>), Zhuhai (<https://en.wikipedia.org/wiki/Zhuhai>), Dongguan (<https://en.wikipedia.org/wiki/Dongguan>), Zhongshan (<https://en.wikipedia.org/wiki/Zhongshan>), Foshan (<https://en.wikipedia.org/wiki/Foshan>), Huizhou (<https://en.wikipedia.org/wiki/Huizhou>), Jiangmen (<https://en.wikipedia.org/wiki/Jiangmen>) and Zhaoqing (<https://en.wikipedia.org/wiki/Zhaoqing>). Although Hong Kong and Macau are also included in the greater PRD region, they are not discussed in this study due to the differences in urban planning systems between these and the mainland cities. The PRD has become a microcosm of China's rapid economic and social development, being the largest urbanised area in the world in both size and population (The World Bank 2015). The PRD differs from Beijing as the central capital in policy, actor and institutional contexts, allowing more democracy for local governance and stakeholder participation (Zhang et al. 2019). This has provided a lens to help in understanding the state-market-civil relations in current Chinese sustainable planning processes.

The multilayer urban planning system proposed in URPL (2008) serves as a structural framework of this study (Fig. 8.1). It includes national hierarchical planning, provincial hierarchical planning, city planning, town planning, township planning and village planning. A city or town plan is further divided into an overall plan and a detailed plan. A detailed plan includes a detailed regulatory plan and a detailed



**Fig. 8.1** Chinese urban planning system (Extracted from the Urban and Rural Planning Law of the People's Republic of China 2008)

construction plan (URPL 2008). The different levels of planning are interlinked. Generally, planning at the lower level needs to comply with the principles defined by the upper planning level (Curien and Thornely 2014). When the revision of planning at a lower level violates the principle determined by the upper planning level, the upper level must introduce a planning change before modifying the planning at the lower level (Article 48, URPL).

## 8.2.2 Document Analysis

Building on Ritchie et al. (2013), a framework analysis was conducted using laws, regulations and rules for urban planning in the PRD since 2008. A five-step structure was proposed to systematically simplify and visualise data, including familiarisation, identification of the thematic framework, indexing, charting and mapping and interpretation (Gale et al. 2013).

### Step 1—Familiarisation

In this step, an overall picture was obtained through scrutinising policy documents related to stakeholder participation and visualisation in Chinese planning. A total of 21 documents covering three administrative levels (LV) were referenced (see Table 8.1), including LV1 law and ordinances enacted by the State Council and Ministry of Urban and Rural Planning ( $n = 3$ ); LV2 provincial by-laws and regulations promulgated by the people's government of Guangdong Province and relevant provincial departments in charge of urban and rural planning ( $n = 4$ ); LV3 city-level regulations and rules formulated by the people's government and relevant departments in charge of urban and rural planning in the PRD ( $n = 14$ ).

**Table 8.1** Different levels of planning laws, regulations and rules

Level	Legal instruments	Formulation body
National	Law	State Council of China (Urban and Rural Planning Law of People's Republic of China 2008)
	Ordinance	Ministry of Housing and Urban–Rural Construction of the People's Republic of China (MHURC 2013); MHURC (2010)
Provincial	Administrative regulations	Standing Committee of People's Congress (SCPC) of Guangdong (2012), SCPC of Guangdong (2014)
	Administrative rules	Housing and Urban Rural Development Department (HURDD) of Guangdong (2012), HURDD of Guangdong (2005)
City	Local regulations	SCPC of Foshan (2018), SCPC of Guangzhou (2015), SCPC of Shenzhen (2020), SCPC of Zhuhai (2016), SCPC of Zhaoqing (2017), SCPC of Zhongshan (2007)
	Local governmental rules	HURDB of Dongguan (2017); HURDB of Guangzhou (2014); HURDB of Foshan (2015); HURDB of Huizhou (2016); Natural Resources Bureau (NRB) of Huizhou (2020); NRB of Jiangmen (2019); NRB of Jiangmen (2013); HURDB of Zhuhai (2016)

### Step 2—Identifying a Thematic Framework

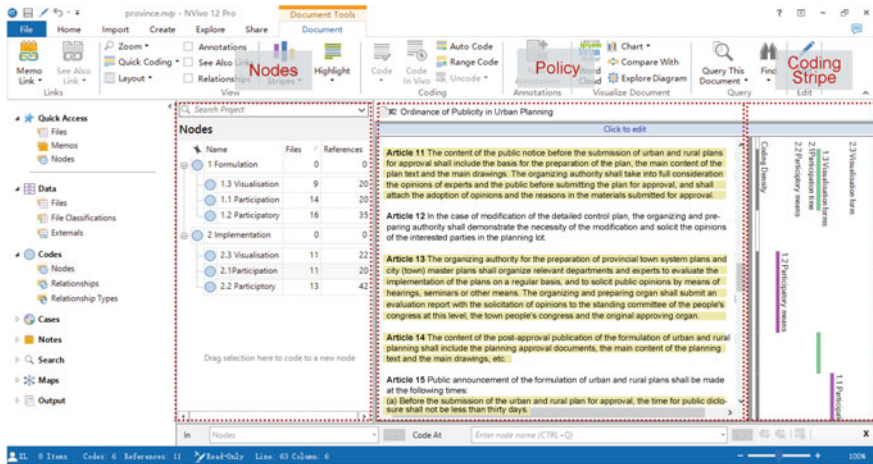
NVivo 12.0 was used to store policy documents and to conduct a systematic review and content analysis of all the legal documents. Following an inductive approach, texts and codes related to stakeholder participation and visualisation methods were highlighted. They were grouped into three themes: participation phase, participatory tools and visualisation media.

### Step 3—Indexing

Each policy was re-read and re-coded in line with the three thematic categories for further analysis. Figure 8.2 presents an example of the indexing process shown in the Ordinance of Publicity in Urban Planning (MHURC, 2013). Themes and codes used in the planning formulation stage were shown in the left column, numbered from 1 to 3 to represent (1) participation phase, (2) participatory tools and (3) visualisation media. The policy was presented in the middle column, with texts related to the themes highlighted in the right column.

### Step 4—Charting

Data was extracted from their original context and rearranged in a table according to the themes, using sources defined in the earlier steps. As is shown in Table 8.2, data from Step 3 was recorded in accordance with the relevant source (article number, name for the planning document). Following the same structure, all the urban and rural planning laws, ordinances, regulations and rules were sorted and charted. They were then combined into a larger chart, with rows (cases), columns (codes) and 'cells' of summarised data (policies).



**Fig. 8.2** Indexing process in NVivo of the Ordinance of Publicity in Urban Planning (2013) (adapted by the authors)

## Step 5—Mapping and Interpretation

The final stage includes analysis of the data that was listed in the charts, which could help to define concepts, map range and nature of phenomena, create typologies, find associations, provide explanations and develop strategies (Ritchie and Spencer 1994). The participation phase, participation tools and visualisation media across the planning formulation period were mapped following the diagram of urban planning system in Fig. 8.1. The similarities and differences between each planning level were then compared in the results section.

## 8.3 Results

### 8.3.1 Participation Phase

Figure 8.3 represents the phase of stakeholder involvement in the planning formulation stage. At different planning levels, while governmental authorities and relevant planning institutes are in charge of the earlier preparation of planning, the public is generally involved in the latter period of the decision-making process. Specifically, when a plan has been made and sent to the relevant governmental authority for approval, the public is often given 30 days or more for feedback. After planning approval, the information disclosure period varies between cities and the participatory tools used, ranging from more than 15 days for on-site publicity boards in Dongguan (SCPC of Dongguan 2012), to long-term publicity on governmental websites in Guangzhou (HURDB of Guangzhou 2014; SCPC of Guangdong 2012).

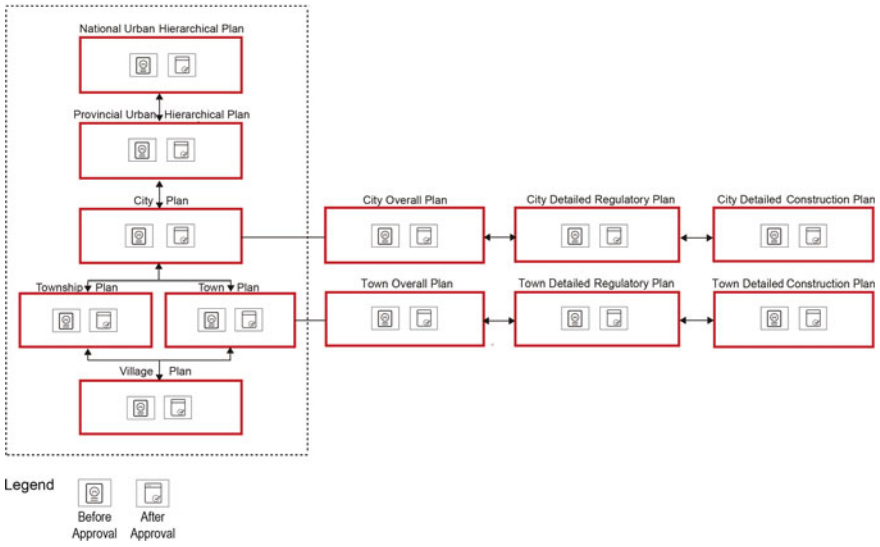
**Table 8.2** The charting process of the Ordinance of publicity in urban planning (2013)

Statutory planning	1.1 Participation phase	1.2 Participatory tools	1.3 Visualisation media
National system planning	□N/A	□N/A	□N/A
Provincial system planning	before approval, > 30 days (A9, N2); after approval, > 30 days (A15, N2)	demonstration (A13, N2); hearing (A13, N2)	text (A11, N2); 2D image (A11, N2)
City/Town overall planning	before approval, > 30 days (A9, N2); after approval, > 30 days (A15, N2)	governmental website (A5, N2)*; exhibition hall (A5, N2)* demonstration (A13,N2); hearing (A13, N2)	text (A11, N2); 2D image (A11, N2)
Detailed regulatory planning	before approval, > 30 days (A9, N2); after approval, > 30 days (A15, N2)	governmental website (A5, N2); exhibition hall (A5, N2); on-site (A5, N2)	text (A11, N2); 2D image (A11, N2)
Detailed construction planning	before approval, > 30 days (A9, N2); after approval, > 30 days (A15, N2)	On site (A5, N2); governmental website (A5, N2)	text (A11, N2); 2D image (A11, N2)
Township plan	before approval, > 30 days (A9, N2); after approval, > 30 days (A15, N2)	On site (A5, N2); governmental website (A5, N2)	text (A11, N2); 2D image (A11, N2)
Village plan	before approval, > 30 days (A9, N2); after approval, > 30 days (A15, N2)	On site (A5, N2); governmental website (A5, N2)	text (A11, N2); 2D image (A11, N2)

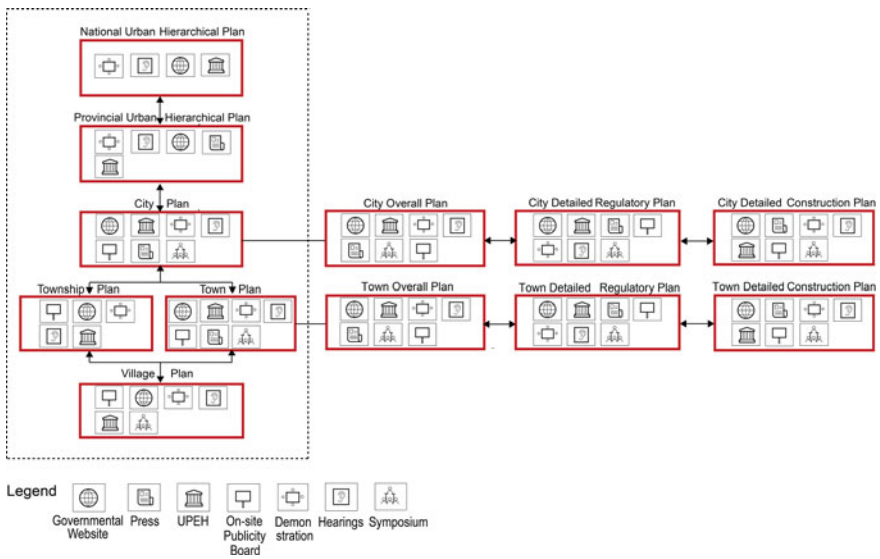
Note A refers to article, and N2 is the code for this ordinance

### 8.3.2 Participatory Tools

The participatory tools as suggested by different planning documents are shown in Fig. 8.4. There is generally little means for participation in hierarchical planning at the national level. At this level, participatory tools include demonstration, hearing, governmental websites and planning exhibitions. At the Guangdong provincial level, participatory tools include demonstrations and hearings (when necessary), governmental websites, news media and planning exhibitions. The use of participatory tools gets more diverse at the city and town scale, in which governmental websites, planning exhibition halls and news media are the most popular tools. Publicity in the public open space is the most frequently suggested tool at the village or township level (LRUPB of Zhaoqing 2004; SCPC of Guangdong 2012; SCPC of Guangzhou 2015; SCPC of Zhaoqing 2017).



**Fig. 8.3** Stakeholder involvement period as required by different planning processes (*Note the icons of participatory period were arranged in descending order according to the mentioned frequency*)

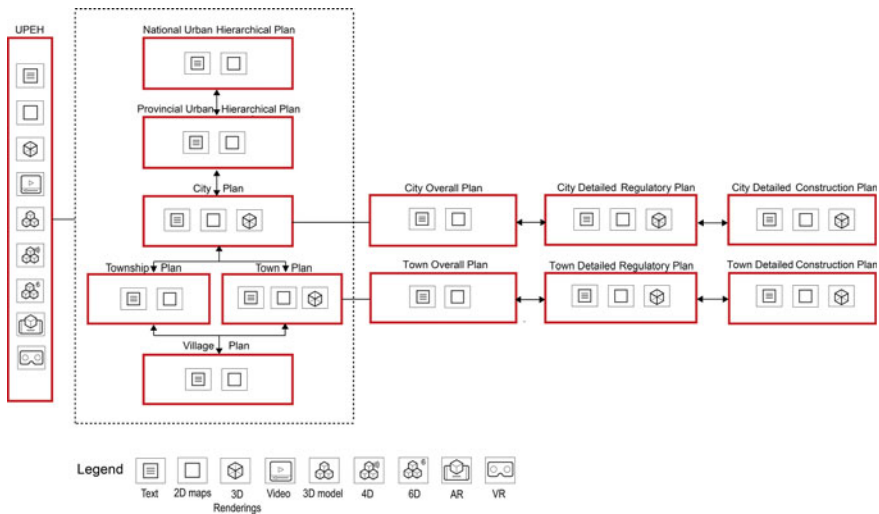


**Fig. 8.4** Participation tools in the planning formulation (*Note the icons of participatory means are arranged in descending order according to the frequency of being mentioned*)

### 8.3.3 Visualisation Media

Visualisation media for communication in the planning formulation stage are illustrated in Fig. 8.5. Visualisation media range from an abstract to more concrete levels as a project proceeds into a more detailed phase. Among the 21 documents, no provision has been specified regarding the visualisation media for the national urban hierarchical plan. Relevant publicity information on governmental websites suggests that visualisation media used at this level include text and 2-D plans, which align with the requirements for the provincial urban hierarchical plan and city/town overall plan (HURDD of Guangdong 2012). When it comes to critical projects in the city/town detailed planning, visualisation media may also include 3-D perspective renderings (SCPC of Foshan 2018). Visualisation tools at the township and village level are not addressed explicitly in some cities. It is recommended that they fit the local situation while following the next higher planning level regulations (HURDB of Guangzhou 2014; NRB of Jiangmen 2019).

In addition to conventional tools such as text, 2-D plans and 3-D rendering, the urban planning exhibition hall (UPEH) offers a whole range of media covering various planning information from a national perspective to site-scale design. In the UPEHs in the PRD, visualisation media for planning communication include large physical models, multi-channel digital sand table models, video, 4-D visualisation, Virtual Reality (VR) and Augmented Reality (AR) (Lu et al. 2020).



**Fig. 8.5** Visualisation media as used for stakeholder participation in the formulation of planning (Note the icons of visualisation media are arranged in descending order according to the frequency of being mentioned in different laws, regulations and rules)

## 8.4 Discussion

At the planning formulation stage, the general public in the PRD is often consulted before planning approval and notified after the decision-making with 30 days for providing feedback. As such, stakeholders in the Chinese context are typically involved at the ‘informing’ or ‘consultation’ level where they may ‘hear and be heard’ (Arnstein 1969, p. 217). However, under such circumstances, they have limited opportunities to get their opinions heeded by the decision-makers. This highlights the need to involve stakeholders at the earlier planning stage and throughout the entire planning cycle to reach more meaningful participatory outcomes.

In general, public hearings, demonstrations and symposiums are frequently used participatory tools to engage with stakeholders, e.g. when planning is associated with great social impact or may seriously affect the area’s image, etc. Nevertheless, these methods have been often criticised for their limited accessibility for the general public (Conroy and Evans-Cowley 2006). The timing and form of venues are often to blame for low participation levels; due to work, family and other responsibilities, few people are able to take the time to engage in these activities.

This weakness has been partially overcome by participatory tools including governmental websites, planning exhibition halls, on-site publicity boards and the news media. Nevertheless, they are primarily intended for one-way information rather than two-way interaction. Participatory tools that allow the general public to be actively and widely involved in the urban planning process are often lacking. Depending on the context of the project and the available resources, it is suggested that participatory methods should be tailored to different planning preparation stages and participation groups. This will allow improved interaction with stakeholders, including those who are hard to reach through conventional methods (Baker et al. 2007).

Text and 2-D mapping are commonly used for communication throughout the statutory planning process, which may fail to be understood by the laypeople due to their rather technical contents (Al-Kodmany 2002). On the other hand, 3-D perspective renderings are only occasionally used in a more detailed planning stage with greater social significance, e.g. in regulatory planning and detailed construction planning in Foshan and Guangzhou. A drawback with perspective images is that they often portray fixed viewpoints, resulting in possible incompatibilities between visual expectations and implementation outcomes (An and Powe 2015; Downes and Lange 2015).

Research has shown that advanced visualisation tools addressing interactivity, immersion and realism can contribute to a better understanding of planning (Lange and Hehl-Lange 2010; Moghimi et al. 2016; Salter et al. 2009). Conventional tools such as participatory maps and physical models may generate a social learning environment for more creative participation (Al-Kodmany 2002; Lu et al. 2021). Therefore, it is recommended to incorporate conventional and advanced visualisation tools in various planning stages to better suit diverse stakeholder needs (Gill et al. 2013). The UPEH is a unique forum providing multiscale planning information with various

state-of-the-art visualisation devices. However, in the Arnstein's (1969) ladder of participation it is located at the tokenism level to inform stakeholders and the full potential of the UPEH in planning communication is yet to be explored.

At the city and town level stakeholder participation is characterised through a range of participatory tools and visualisation media. In contrast, there is relatively little room for participation and at the higher and lower planning level. Several reasons could explain this: (1) higher-level planning that operates on a long-term basis is often very abstract and might be too complex for the general public to engage with; (2) the village and township plan were rather recently introduced in the urban planning system in 2008 (Gar-on Yeh and Wu 1999), which might explain a lower take-up in practice so far; (3) township and village levels are differentiated from the city and town level in economic power, land ownership, social style and governance model, which may affect effective participation at the local scale (Wu et al. 2015); and (4) a lack of awareness and level of education among the local people in the lower planning level. Overall, there is scope to improve active participation at the higher and lower levels of the comprehensive urban planning system.

## 8.5 Conclusion

This study highlights the importance of stakeholder participation and visualisation in sustainable urban transformation. It looks into the operation of stakeholder participation and visualisation in the Chinese statutory planning process. A document analysis was conducted using 21 planning policies at different planning levels of the PRD region, featuring participation phase, participatory tools and visualisation media. Results suggest that the public is often involved when the plan has been made, before approval and is notified after approval. The challenge remains to provide a participatory context allowing involvement of a wide range of stakeholders and offering two-way interaction. While typically text, plans and 3-D perspective images are used for stakeholder engagement, urban planning exhibition halls are unique forums for planning communication offering a range of sophisticated visualisation tools and providing multiscale planning information. The effectiveness of the UPEHs to communicate the contents of planning provides opportunities for further research.

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