



Contents lists available at ScienceDirect

Habitat International

journal homepage: [www.elsevier.com/locate/habitatint](http://www.elsevier.com/locate/habitatint)

## A solution to the conflicts of multiple planning boundaries: Landscape functional zoning in a resource-based city in China

Yanxu Liu<sup>a</sup>, Bojie Fu<sup>a,b,\*</sup>, Wenwu Zhao<sup>a</sup>, Shuai Wang<sup>a</sup>, Yu Deng<sup>a</sup>

<sup>a</sup> State Key Laboratory of Earth Surface Processes and Resource Ecology, Faculty of Geographical Science, Beijing Normal University, 100875 Beijing, China

<sup>b</sup> State Key Laboratory of Urban and Regional Ecology, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, 100085 Beijing, China

### ARTICLE INFO

#### Keywords:

Landscape restriction  
Landscape suitability  
Landscape functional zoning  
Spatial planning  
Boundary conflict

### ABSTRACT

How can planners integrate multiple planning processes with conflicting spatial boundaries from various administrative departments? This question presents one of the key obstacles in China's current spatial planning practices and has aroused controversy among planners from diverse disciplinary backgrounds. Focusing on the differences in spatial scale between economic and social development planning, land use planning and urban master planning, this study explores an integration of multiple planning approaches at different spatial scales based on a landscape functional zone (LFZ) analysis for Hebi City, a resource-based city in China. The landscape has been segregated into cultivated landscapes, ecological landscapes and urban landscapes, with rigid and conditional restriction levels for either dominant landscapes or coherent landscapes. In the result, the landscape was zoned into 11 classifications based on the 22 restriction and suitability indicators. Rigidly restricted cultivated landscapes accounted for 45.37% of the total area, and conditionally restricted ecological landscapes ranked second with 12.52% of the total area. With regard to the context-dependent planning debate of land sharing/land sparing, the LFZ is able to support land-use policy making at the landscape scale. To conclude, the LFZ could be an innovative solution to the planning conflicts because it clarified the spatial difference of land use in the zones and limited the conflicts of multiple planning boundaries to a few local multifunctional landscape patches.

### 1. Introduction

Spatial planning, developed in European countries in the last century, is a planning system included in land use, urban, regional, transport and environmental planning in order to balance landscape exploitation and conservation in regional development (Abrantes, Fontes, Gomes, & Rocha, 2016; Kabisch, 2015; Thaler, Priest, & Fuchs, 2016; Van Assche, Beunen, Duineveld, & de Jong, 2013). In the United States, spatial planning is similar to traditional urban planning but at a larger scale and with a greater emphasis on understanding geographic space for the future of residential and habitat uses, either for urban areas or for an entire region with its countryside (Brown & Raymond, 2014; Klain & Chan, 2012; Vaz, 2016). As the planning in a region could be multiscale, institutional barriers often exist in spatial planning systems (Matthews, Lo, & Byrne, 2015). This is especially true in developing countries with rapid urban-rural land use transformation, e.g., China, where multiple administrative departments may have different understandings of what constitutes balanced development for a landscape (Li, Long, & Liu, 2015; Liu, Liu, & Yan, 2016; Liu, Yang, Li, & Li,

2017; Long, Zou, & Liu, 2009; Wang, Liu, Li, & Li, 2016). The direct impacts from those different understandings are the conflicts over spatial boundaries in multiple planning approaches, which is one of the key obstacles to spatial planning in rapidly urbanizing developing countries.

With the consideration of peri-urban area and rural areas, the spatial planning practice largely related to regional land-use/landscape management. Spatial planning has been regarded as solution to integrally create new social, economic and environmental opportunities (Gallent, Bianconi, & Andersson, 2006), and landscape is acted as the medium to facilitate integration in planning projects (Van Damme, Leinfelder, & Uyttenhove, 2013). Accordingly, multiple ecological objectives and socio-economic constraints on landscape should be considered (McAlpine et al., 2010), especially for the countries undergone phenomenal socioecological transformation (Li et al., 2017). However, because of the land development realities may not match the projected goal of centralized spatial planning (Lerise, 2000), the planned policy may get a failure, especially on the fast changing peri-urban landscape (Llausas, Buxton, & Beilin, 2016). In recent years, more indicators and

\* Corresponding author. Faculty of Geographical Science, Beijing Normal University, No. 19, XinJieKouWai St., HaiDian District, Beijing 100875, China.  
E-mail address: [bfu@rcees.ac.cn](mailto:bfu@rcees.ac.cn) (B. Fu).

<https://doi.org/10.1016/j.habitatint.2018.01.004>

Received 23 September 2017; Received in revised form 15 January 2018; Accepted 17 January 2018  
0197-3975/ © 2018 Elsevier Ltd. All rights reserved.

more advanced tools have been introduced in to spatial planning, such as the conceptual consideration of ecosystem services (Baro, Gomez-Baggethun, & Haase, 2017), the approach of remote sensing (Heiskanen et al., 2017), and the development of spatial decision support tool (Gret-Regamey, Altwegg, Siren, van Strien, & Weibel, 2017). Nevertheless, these developments of spatial planning have not eliminated the initial conflicts of land use demands from different stockholders, which result in the conflicts over spatial boundaries in multiple planning approaches.

Taking China as an example, urban planning brings greater attention to the conditions of urban sprawl (Kuang, Chi, Lu, & Dou, 2014), land use planning establishes farmland protection as a rigid constraint (Liu, Fang, & Li, 2014), while economic and social development planning provides quantitative objectives for social conditions (Long, Liu, Hou, Li, & Li, 2014). As a consequence, the same land parcels have undergone planning processes for incompatible land use types with different planning objectives, and all of the administrative departments highlight the rationality of their own plans on the land parcels. Considering the low level of plan implementation in China in recent years (Tian & Shen, 2011), the coordination of spatial plans in China has been highlighted. However, under the nested institutions of planning making, local spatial planning is easy to be intervened, and thus spatial plan coordination failed (Wang & Shen, 2017). Therefore, the construction of a spatial planning system is required in China, which has been explored in some pilot cities (Zhou, Lu, Lian, Chen, & Wu, 2017).

How should multiple planning approaches with conflicting spatial boundaries be integrated? The solution may be rooted in the understanding of spatial hierarchy at the landscape level (Oneill, Gardner, & Turner, 1992). The regional landscape should be managed on a scale-dependent basis because planning conflicts at the parcel scale are often induced by a failure to conduct landscape management at a greater scale (Bettinger, Lennette, Johnson, & Spies, 2005; Swaffield & Primdahl, 2006). The planning conflicts regarding land use at the parcel scale are inconsistencies in landscape management at the bottom scale of the hierarchy. To integrate plans, consistency in landscape management from different departments at the upper scale of the hierarchy is the necessary first step. Here we propose a planning concept, the 'landscape functional zone (LFZ)', as a conceptual tool with methodological procedures to integrate the multiple planning boundaries.

Faced with the obstacle of spatial boundary conflicts in China's spatial planning, this study uses Hebi City, a resource-based city in China, as a study area to demonstrate the practical applicability of the LFZ. Recognizing the various landscape uses of production, residential and ecological space at the regional scale, the landscape has been reclassified into cultivated landscapes, ecological landscapes and urban landscapes. Two management categories of restriction and suitability are provided to identify the multifunctional landscape. The study has two main objectives: (1) to establish the conceptual framework of the LFZ as one of the frontiers of exploration of zoning for oriented functions on landscape units in China's spatial planning system and (2) to demonstrate the effectiveness of the LFZ as a landscape management policy in the land sharing/sparing debate.

## 2. Literature review

### 2.1. The state of art to solute spatial planning conflicts

The recent theoretical and methodological exploration on multiple plans integration in China could be typical examples of the state of art to solute spatial planning conflicts. The essential reasons on the conflicts of Chinese spatial plans have been concluded into five aspects, namely the unclear positioning of the planning systems, the excessive requirements for comprehensive disciplines, the disunity of planning standard, the discordance of planning approval, and the neglect of planning regulation (Huang, Zhou, Wang, Luo, & Ni, 2016). Exploring the methodological pathway to unify the spatial information from

multiple plans into "one map" has been highlighted by today's Chinese spatial planners. To carry out the spatial plans for local governance, multiple plans integration on prefecture and county level are particularly important, which requires the coordination of agricultural space, ecological space and urban living space on land parcel level (Chen, Yan, & Sun, 2015). The practical case of multiple plans integration in Xiamen City shows that departmental consultation could be an effective way to trade-off the conflicts between urban growth boundary and ecological control line (Wang & Wei, 2015). Focusing on the advanced arrangement of the spatial utilization, the "optimization of production-living-ecology space" has been highlighted the core task in multiple plans integration (Yan, Chen, & Xia, 2017). Moreover, the connotation of "one map" has been explained: the map is a protective and constrained plan rather than a constructive plan; is applied to determine the main function of land parcel rather than general guiding; is opened to stakeholders rather than government-dominated (Fang, 2017). According to these understandings, methodological exploration on multiple plans integration should attach importance to the follow keywords: function orientation, production-living-ecology space, land parcel scale, prefecture and county level, mapping, and data combination.

In China, the national plan of the Major Function Oriented Zone (MFOZ) at the county level provides fundamental guidance on the major function of each county, such as urbanization/industrialization, ecological construction, and grain production (Fan, Sun, Zhou, & Chen, 2012). These zones have been planned based on the resource and environment capacity of the counties and have been consented by all the governmental departments. In specific, 28 indicators in 10 criteria were used in MFOZ planning. The criteria include available land resource, available water resource, environmental capacity, ecological vulnerability, ecological importance, natural hazard, population concentration, economic development level, traffic superiority, and strategic option. Under the guidance of development orientation, the spatial plans from different departments could be constrained at some extent (Du et al., 2014). The difference of built-up area increasing among the four types of MFOZ shows the macroscopic spatial guidance of this plan (Liu, Liu, Kuang, & Ning, 2017). While affirming the positive significance of the MFOZ, it must be recognized that a drawback of this plan is that the county unit could be too coarse to inform the spatial suitability of landscape exploitation in a prefecture-level city. In other words, planning consistency at the county scale cannot substantially reduce the conflicts over spatial boundaries from multiple planning process at finer scales.

### 2.2. The conception of LFZ

Inspired by the MFOZ, zoning at the regional landscape level with different orient functions could establish a planning scale above the land parcel level and finer than the county level. In spatial planning in China, the 'orient functions' of space have often been classified as production, living and ecological spaces (Long & Liu, 2016; Long, 2014). From the disciplinary perspective of landscape ecology, planning towards a multifunctional landscape has been regarded as an effective way to achieve sustainable landscape management (Ahern, 2013; Naveh, 2001; O'Farrell & Anderson, 2010; Peng, Chen, Liu, Lu, & Hu, 2016; Reyers, O'Farrell, Nel, & Wilson, 2012; Rodriguez-Loainaz, Alday, & Onaindia, 2015). For both approaches, spatial understanding of the effects and limits of landscape uses on the space is required in spatial planning. Accordingly, zoning should be an effective tool to provide the grouped spatial information and support the planners understanding the regional differences. As an innovated conceptual tool for integrating multiple spatial planning processes with conflicting spatial boundaries, the definition and several implications of the LFZ concept are listed as follows.

- 1). What (is the LFZ)? The LFZ is a reclassification of landscape units based on both natural environmental characteristics and landscape

Download English Version:

<https://daneshyari.com/en/article/7454959>

Download Persian Version:

<https://daneshyari.com/article/7454959>

[Daneshyari.com](https://daneshyari.com)