

Article

Underperformance of Planning for Peri-Urban Rural Sustainable Development: The Case of Mentougou District in Beijing

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Abstract: As the basic cell of social structures and spatial units, rural settlement is now experiencing profound changes through the rapid urbanization process underway in China, particularly in peri-urban areas which serve as the main platform and battlefield for urban–rural integration in China’s latest round of new urbanization. Therefore, how to achieve better planning for rural settlement in peri-urban areas is becoming a pressing and paramount research agenda. This paper attempts to explore the possible reasons for the underperformance of planning practice for rural settlement in peri-urban areas of China by taking the Mentougou district of Beijing as a case study. Following a quick and comprehensive review of planning in Mentougou district, a systematic and critical evaluation is then conducted accordingly. It shows that the plans generally play a positive role in development orientation and implementation. Yet, there is still a lot of room for improvement, particularly in the following aspects: (1) lack of initiative and innovation at the local level; (2) lack of long-term vision and consistent implementation; (3) lack of rationale-oriented approach; (4) lack of scientific and in-depth research; (5) lack of multi-stakeholder participation. As a way forward, this paper thus proposes a revised planning scheme for local practice, including classification of typologies and the customized planning design for each typology. At last, this paper calls for more in-depth scientific research on some key topics in the planning field, domestically and internationally.

Keywords: planning underperformance; peri-urban; rural sustainable development; Mentougou district; Beijing

1. Introduction

With rapid urbanization taking place in the past three decades, China has become an urban society with urbanization levels above 56% in 2015. Yet, nearly 44% of the total population still lives in rural settlements with the absolute number at 603 million [1], approximately the population of two United States or five Japans. While the spatial evolutionary pattern of urbanization in China has mainly featured horizontal expansion, making peri-urban areas a most dynamic [2] but complicated region interweaving various acute conflicts for urban comprehensive development, yet peri-urban areas will continuously serve as the crucial spatial accommodator for new urbanization, oriented to sustainable and healthy urban development and reflected by a high quality of urban life and urban–rural organic integration. Therefore, the effective development of peri-urban areas has increasingly been a hot issue

and huge challenge for both the academic community and governments at all levels, in which rural settlement development is the key challenge.

China's administrative villages roughly decreased from 800,000 in 2008 [3] to less than 700,000 by 2015 [4], while most of them are located within the territories of 292 prefectural-level or above cities. Given the unique character of China's prefectural-level cities administering a large territory at an average of 10,000 square kilometers, usually including several counties, peri-urban areas receive much attention in domestic and foreign academic circles as well as by mass society due to a series of conflicts that have arisen between people and land as well as policy-oriented changes in boundaries [5] and dynamic variability in the transitional phases of peri-urbanization.

Planning has been playing a dominant role in guiding economic and social development in China due to the fact that, firstly, China has had for a long time a planned economy, leaving a pervasive political legacy with heavy path dependence; secondly, the planning system (Figure 1) covers a wide range of fields, activities and regions, including Five-Year Plans (FYP) for socio-economic development, regional integration plans such as plans for urban system and city clusters, master urban plans and detailed urban design, land use and functional zoning plans such as plans for new countryside construction and new suburban towns, environmental protection plans, specific sector and industry plans such as various plans for agriculture, manufacturing, tertiary service, cultural development, tourism, energy, transportation, facilities and infrastructure, gardening and greenization, landscape, disaster alleviation, poverty reduction, etc., as well as many more portfolio programs and projects; thirdly, governments at all levels still play the leading role in the development process while planning serves as a most powerful tool and as an effective approach.

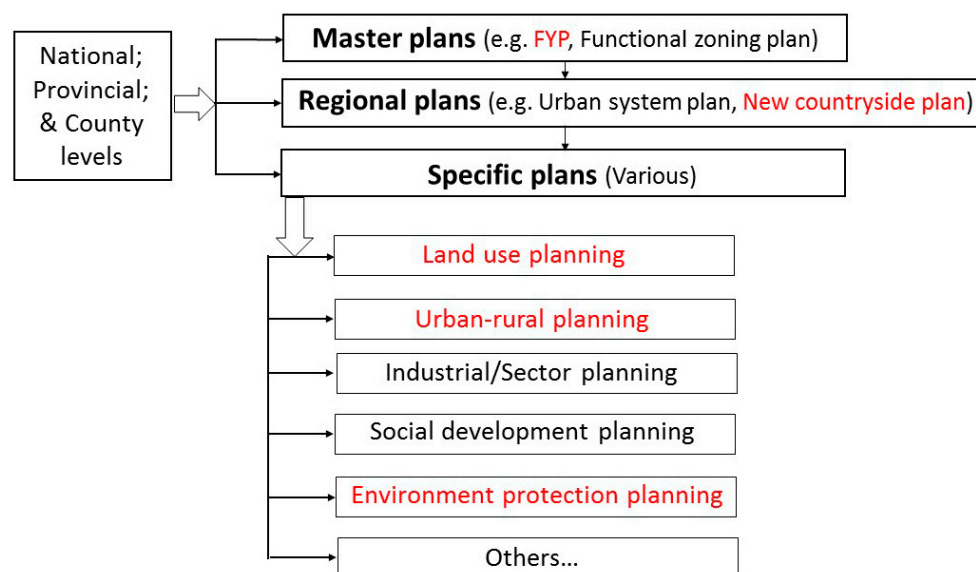


Figure 1. Sketch diagram of China's planning system. Plans marked in red in the figure refer to the key plans especially linked to peri-urban rural areas.

Of the above-mentioned plans, some of them are more sophisticated than others. For example, FYP and urban master plans are much more influential and effective due to their legal status and institutional maturity based on long practice, while plans for new countryside construction, cultural development and poverty reduction have been less successful than expected due to the lack of a systematic framework and visionary strategic thinking. As a result, the existing theories including planning for villages and town development far lag behind dynamic practice, thus are unable to provide valuable, forward-thinking and objective-oriented guidance and instructions fitted to local settings. Therefore, it is necessary to establish a future-oriented and instructive planning framework and a theoretical system for rural settlement development in peri-urban areas based on a comprehensive and

in-depth analysis from hard and soft local feature perspectives, including the physical environment, demographic forecasts, socio-economic trends and unique cultural features.

In the 1960s and 1970s, developed countries and some developing countries had already conducted many relevant studies and practices in the fields of town planning [6–12] and rural construction [13–18]. For example, by the end of the 1960s, the German government began to implement a nation-wide scheme to promote and update rural settlement development in order to prevent villages from decaying and waning [19]. The plan of “equilibrium between urban and rural areas” in the scheme implemented in Bavaria for constructing a “modern village” set a good example and a demonstration model for the whole EU (European Union). At the beginning of the 1970s, the South Korean government launched a campaign for new rural construction with the aim to reduce agricultural decline and improve rural performance [20], where the farmers were encouraged to involve themselves in the construction on the basis of government aid programs, farmers’ initiatives and project implementation. At the end of the 1970s, Japan also started a “movement of rural construction” to revitalize the stagnant rural areas with sparse rural populations through stimulating industrial development and economic growth [21]. Accordingly, systematic rural planning was formulated by the Japanese government and a famous “pilot project movement of balanced urban and rural construction” was implemented under the context of rapid urbanization. While in China, it has shifted its priority from emphasizing “urbanization drive” in the 10th FYP (2001–2005) to “new countryside construction” in the 11th FYP (2006–2010), and a “balanced urban-rural development” in the 12th FYP (2011–2015). In the coming 13th FYP (2016–2020), the focus further shifted to “new urbanization approach seeking for high quality of urban life and human-centric ecological civilization”.

In terms of theoretical and empirical research on socio-economic development patterns of towns and villages, three main classification typologies for the driving forces and spatial interactions are found internationally. First, the Rurality Index was created for quantitatively classifying typologies and evaluating the development strength of rural areas based on the introduction of the new concept of rurality. For example, based on demographic characteristics, household status, employment structure and distance from downtown, Cloke and Edwards (1986) divided rural areas in England and Wales into four types, i.e., extreme rural, intermediate rural, intermediate non-rural and extreme non-rural [5]. Following this research suite, Leduc (1997) defined the rurality index for Canada as a general practice [22]. Humphreys (1998) delimited rural areas based on an agreed rurality index for healthcare resources allocation and planning in Australia [23]. Ricardo and Carmen (2005) specifically conducted a rurality index for small areas in Spain [24] and updated the index in 2010 [25]. Li, Long and Liu (2015) applied a rurality index to the spatio-temporal pattern of China’s rural development [26]. Besides, Organization for Economic Cooperation and Development (OECD), in its report of 1994, classified the development patterns of towns and villages into three types, i.e., village-dominant, city-dominant and village-city balanced development, based on a set of indicators [27] from the perspectives of spatial region, economic development and dynamic mechanism.

Second, in-depth studies on driving forces of rural development were undertaken in view of locational advantages, special functions, industrial structure and rural economic level. For example, Wiggins and Proctor (2001), based on locational advantages, put forward three types of rural development areas with different economic functions, i.e., peri-urban area with some urban expansion functions, middle countryside with new urban-oriented opportunities such as transportation and communications improvements, and remote areas with special challenges and less chance of development in general [28]. Meanwhile, emerging studies on urban agriculture, in-situ bottom-up industrialization, agro-tourism and rural cultural tourism were also conducted in recent years. For instance, Dragulanescu and Drutu (2012) elaborated that rural tourism, given its largeness of value in terms of economic, environmental, social and cultural aspects, will profoundly strengthen rural sustainable development [29].

Third, rural–urban linkages and integration have been an increasingly hot topic for rural studies, mainly in terms of rural–urban migration, industrial relocation, accessibility improvement

through infrastructure construction and upgradation, urban–rural fiscal transfer systems, as well as management and governance. For example, through the study of four small towns in the UK (United Kingdom), Courtney et al. (2007) proved that the potential value of a town to be a “sub-pole” in local economic development was dependent on structural differences in the local economy, with the mix of firms within towns in particular, as well as their spill-over effects based on local connectivity [30]. The four cases showed that financial services and banking possessed higher multipliers for both output and employment in rural areas. Malik (2015) illustrated that rural–urban migration dynamics could have significant economic, cultural, political and social impact on the lives of not only migrants but also the destination based on an empirical study in Pakistan [31]. The paper also implied that if proper policies and good plans could be taken and implemented, the challenges would be curbed and the benefits maximized.

Domestically, various studies on the development patterns of towns and villages were also conducted. For example, Liu and Chen (1998) divided 36 counties of Shandong province into four types [32]: low-level (dominated by agriculture), intermediate level (dominated by rural industry and agriculture), moderately high level (dominated by rural industry, agriculture and service industry) and high level (dominated by rural industry and tertiary industry). Qiao, Kong and Li (2008) defined six types of village-level economies based on rural living standards in China in terms of annual net income per capita, i.e., “to be extremely poor”, “to make a basic living”, “to dress warmly and eat healthily”, “to try to enrich (to disengage poverty)”, “to be well-off” and “to be affluent” [33]. Long, Liu and Zhou (2009) divided counties in eastern coastal areas, on the basis of rural industrial structure, into four types, i.e., agriculture dominated, industry dominated, business and service dominated and balanced development [34]. Han and Cai (2011) pointed out that China’s peri-urban rural habitats generally experienced three phases from traditional homogeneous morphology into functional zoning transformation [35]. Yang et al. (2016) elaborated that the varied forms of peri-urban agriculture and its innovative practice were the active responses to urban development in the case of Beijing [36].

Nevertheless, the existing research rarely examined the impact of planning on the socio-economic development of peri-urban rural areas. Therefore, the objective of this research intends to make its contribution in this regard from the planning assessment perspective, by filling in the gap through the empirical case study of rural villages in Mentougou district, a typical peri-urban area in Beijing, to illustrate both the merits and drawbacks of planning in an aim to enhance the comprehensive quality of China’s planning system; promote sustainable development of rural settlements in peri-urban areas in general; and provide good references for in-depth international comparison studies. To realize these objectives, we tentatively proposed a revised planning scheme by first classifying the typologies for villages and then establishing customized planning policies for each typology accordingly.

2. Study Area and Methodology

As one of the nearest peri-urban districts in Beijing, which has a population of about 23 million and a total land area of nearly 17,000 km² (2/3 are mountainous areas), Mentougou district is located southwest of the city, 20 km from the center. With a total area of 1455 km², 98.5% is mountainous area. At the end of 2007, Mentougou consisted of 9 towns, 4 street commissions, 100 communities and 177 administrative villages (Figure 2). The total Hukou (household registered) population was 239,990, of which the urban and rural populations were 177,100 and 62,890, accounting for 74% and 26%, respectively, while by the end of 2015, the total Hukou population reached 249,436, of which the urban and rural populations, respectively, were 201,259 and 48,177 [37], accounting for 81% and 19%.

As the traditional westward corridor connecting Beijing to Hebei province and beyond with abundant coal mines and other natural resources, Mentougou had had a very important strategic position and a long history of goods collection and distribution with many culturally-rich villages along the corridor. With mountains covering nearly all the territory, Mentougou boasts unique landscape and beautiful scenery with 18 valleys of different sizes. By taking advantage of these natural and human endowments, Mentougou is famous for its resource-oriented industries such as coal mining, iron and

steel from the Qing dynasty (1636–1912). Its current industries are gradually being transformed with the emphasis on environmentally-friendly industries including multi-functional peri-urban agriculture, tourism, culture-based industries, business and trade, as well as modern services. By 2015, Mentougou had become a tertiary-dominated district, reflected by its GDP (Gross Domestic Product) structure of 0.6:48.4:51 for first, secondary and tertiary industry proportions, respectively, with the total volume reaching 14.4 billion yuan.

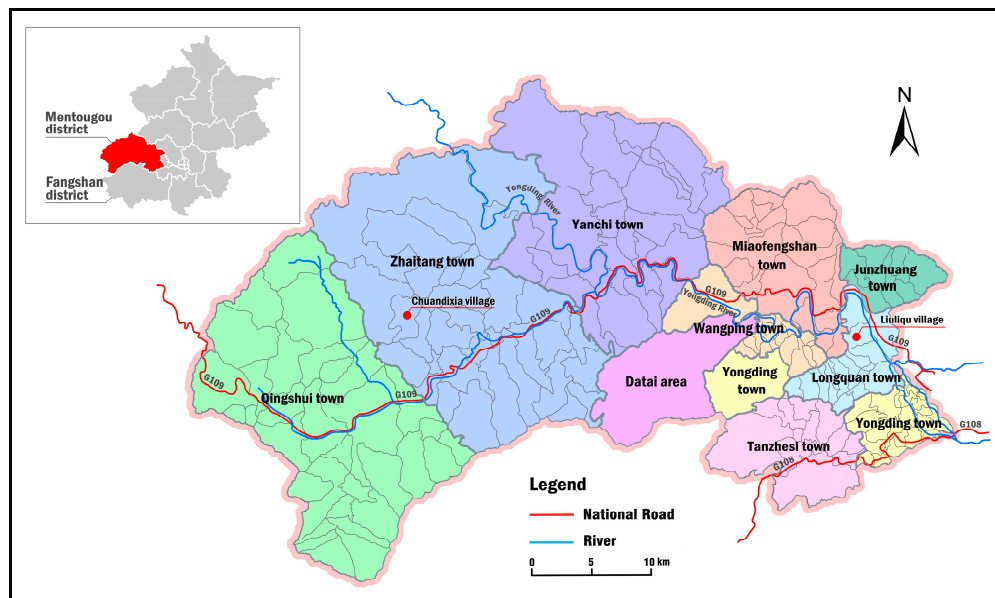


Figure 2. Map of Mentougou district and its location in Beijing.

Given the case-based study paradigm, the methodology of this paper adopts a simple flow chart whereby, first of all, a planning review will be conducted based on the context analysis; then a planning assessment and evaluation is carried out with an emphasis on the plan's drawbacks and underperformance, as well as the reasons for these by giving typical examples rather than a systematic analysis, in order to highlight the key problems for each planning period; following the evaluation, a revised planning scheme for improving the quality of planning will be proposed in the later part of the paper through conducting the classification of village typologies and making customized planning policies accordingly for each typology. In the conclusion and discussion section, the results and findings will be reaffirmed.

3. Planning Review

China never lacks plans. There are various kinds of plans at different levels of governments covering nearly all the sectors ranging from macro socio-economic development to micro specific engineering project design. The whole planning system is complicated both in regions and sectors. Plans can be interweaved with each other in many cases, yet there is a hierarchical structure in which lower-level plans should follow or align with those upper-level ones. In case of Mentougou district, all its plans should be, in principle, subject to the corresponding upper-level plans issued at the municipal level of Beijing government departments. While looking at various plans in Beijing in the regional context, such as Beijing 10th FYP (2001–2005), Master Plan of Coordinated Development of Beijing Mountainous Areas (2006–2020), Plan of Tourism Project Construction in Beijing Ecological Conservation-based Development Areas (2009–2020), Beijing Yongding River Green Ecological Corridor Development Plan (2010–2020), Table 1 listed some key plans in Mentougou district during 2001–2015, in which the orientation, goal and key focus for each plan were summarized in a systematic and comparative way.

Table 1. Some key plans in Mentougou district during 2001–2015.

Key Plans	Orientation and Goals	Key Focus
10th FYP, 2001–2005	Urbanization	<ul style="list-style-type: none"> • 3 special pillar industries based on local resource advantages • 4 functional areas
New Town Plan, 2005–2020	Spatial response to 10th FYP	<ul style="list-style-type: none"> • 1 axis along 109 National Rd., 2 functional zones of east and west • 1 new town with 2 wings in east and 1 sub-center in west
Land Use Plan, 2006–2020	Land use quota allocation based on function positioning	Strategically positioned as an <i>ecological conservation district</i> in Beijing
11th FYP, 2006–2010	New countryside development	<ul style="list-style-type: none"> • Economic restructuring shifting to 5 pillar eco-friendly industries • Rural infrastructure investment improved, helping foster several special-function villages
Economic Development Strategic Plan for Valley Areas, 2010–2020	Socio-economic and spatial response to 11th FYP as the initiator putting forward <i>valley economy</i> concept in Beijing	Comprehensive development plans for 18 valleys, based on which a series of successful demonstrated valley areas established
12th FYP, 2011–2015	Urban-rural balanced development	<ul style="list-style-type: none"> • Coupling economic development with spatial structure • 1 belt, 2 lines, 3 nodes, 3 functional zones of east (new town), middle with 4 pillar industries respectively, and west with 3 pillar industries.
Strategic Plan for Tourism, Culture and Leisure Development, 2011	<ul style="list-style-type: none"> • Targeted to be a <i>National pilot district in tourism comprehensive reform</i> • Economic development and industry response to 12th FYP and its positioning as an <i>ecological conservation district</i> in Beijing 	<ul style="list-style-type: none"> • Marketing potential analysis • Activity design including training • Spatial positioning and arrangement • Institutional and governance reform including financing and land use
Development Plan for Rural Lagging Areas, 2015–2020	Improve development of ecologically-vulnerable remote mountainous area	<ul style="list-style-type: none"> • Green and ecological tourism • Rural culture tourism • Agro-tourism & leisure

Source: Authors based on information from Beijing municipal government official website [38], and Mentougou district government official website [39].

3.1. The 10th FYP Period (2001–2005)

Aligned with Chinese pro-urbanization policy orientation in the 10th FYP, Mentougou district correspondingly made its 10th FYP themed on urbanization drive, in which three special pillar industries based on local resource advantages were identified—i.e., building materials, forestry and animal husbandry, and eco-tourism—and four functional areas were designated for promoting the spatial development of urbanization, i.e., extended Beijing western urban area, Mencheng satellite town (including Shilong Industrial Development Zone), special forestry and husbandry area, and west eco-tourism area. In this plan, nearly all the urban nodes and key towns were emphasized while most villages were neglected. According to the plan, by the end of 2005, a set of modern urban infrastructure facilities and a fairly complete urban system would be in place. Meanwhile, over 70% of the population would be non-agricultural.

To further reinforce the urbanization process, a special New Town Plan (2005–2020) was carried out accordingly as the spatial response to the 10th FYP. In this plan, a clear spatial pattern was put forward with one axis along 109 National Highway, two functional zones of east urban comprehensive service area and west ecological conservation-based development area, one urban node of Mentougou new town and two wings of Junzhuang town in the north and Tanzhesi town in the south, as well as one sub-center of Zhaitang town in the west (Figure 3). To better implement the New Town Plan, a specific Land Use Plan (2006–2010) was made for allocating land quota based on the different functions' positioning in the New Town Plan, in which land use quota allocation for non-urban functional area was strictly restrained, resulting in a fairly high intensive development in the urban functional area. Given its unique mountainous landscape and geographical conditions with a vulnerable ecological system, Mentougou was officially positioned for the first time as an *ecological conservation district* in Beijing, with the strategic intention to be an environmentally friendly area for sustainable development.

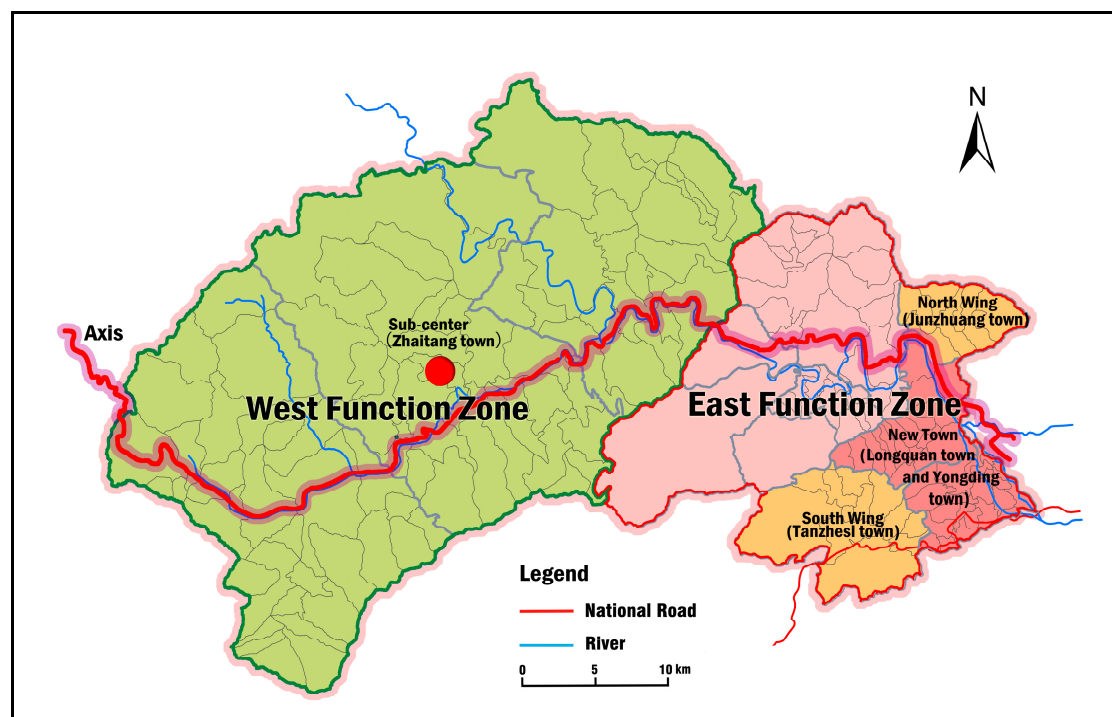


Figure 3. New town plan: 1 axis, 2 functional zones, 1 new town, 2 wings, 1 sub-center.

3.2. The 11th FYP Period (2006–2010)

The focus of China's socio-economic development in the 11th FYP was shifted to new countryside construction. Accordingly, Mentougou district, in its 11th FYP, also changed the emphasis in rural

areas through economic and spatial restructuring, in which five eco-friendly pillar industries were selected, i.e., tourism and leisure, modern urban agriculture, high-tech industry, producing service and cultural creative industry. In terms of spatial arrangement, rural infrastructure investment was greatly increased in order to help foster several special-function villages. Meanwhile, rural comprehensive reform was continuously deepened, reflected in the fact that land ownership was further clarified and confirmed, a land transfer information platform was established, institutional reform on collective property ownership was introduced, and an eco-forestry compensation system was put into practice.

In response to the 11th FYP, Mentougou came up with an Economic Development Strategic Plan for Valley Areas (2010–2020), in which the concept of *valley economy* was initiated in Beijing and comprehensive development plans for 18 valleys in the district were made accordingly. Based on these plans, a series of successful valley areas were proposed and established, such as the valleys of Chuanbaigou, Weidiangou, Jiuyuangou and others featuring green and ecologically natural settings, and unique local cultures and heritage, with an aim to enhance the income and livelihood of rural dwellers in these valley areas.

3.3. The 12th FYP Period (2011–2015)

After the emphasis on urbanization in the 10th FYP and new countryside construction in the 11th FYP, the focus in the 12th FYP was trying to integrate these two themes into a more comprehensive goal, in which urban–rural balanced development was promoted. By coupling economic development with spatial structure, Mentougou district laid out a more systematic, comprehensive and multi-fold-oriented spatial arrangement (Figure 4) featuring one belt of Yongding River green and ecological development belt, along the two sides of which four industrial clusters of three business areas and one recreational area were planned with an aim to upgrade the urban service functions; two lines along 109 and 108 National Highways with the emphasis on natural ecological and rural cultural tourism anchored by demonstration valleys and heritage villages; three nodes of Tanzhesi town in the south positioned as a globally well-known tourism and recreational town anchored by its famous Buddha temple with a long history of over 1700 years, Zhaitang town in the west as a unique gathering town for national tourism, and Junzhuang town as a livable forest town oriented to Beijing; three functional zones of new towns in the east focusing on urban services with four pillar industries of business service, high-end real estate, recreational entertainment and urban cultural creativity, a shallow mountainous area in the middle focusing on eco-tourism with four pillar industries of high-end tourism, resort, peri-urban cultural creativity and movie casting, and a remote mountainous area in the west focusing on ecological conservation and eco-friendly development with three pillar industries of eco-sightseeing, special agriculture and rural cultural creativity.

As the economic development and industrial response to the 12th FYP and its positioning as an *ecological conservation district* in Beijing during the 10th FYP period, Mentougou carried out a Strategic Plan for Tourism, Culture and Leisure Development (2011), in which the marketing potential of the district was analyzed, a series of activities including training were designed coupled with spatial positioning and arrangement layout, and institutional and governance reforms including financing and land use were suggested and recommended as well. Coincidentally, this plan partially made its contribution to Mentougou's efforts to be a *National pilot district in tourism comprehensive reform*.

To further promote the balanced development of the whole district, a campaign for improving the development of ecologically-vulnerable remote mountainous areas was conducted, in which a more specific and in-depth Development Plan for Rural Lagging Areas (2015–2020) was debuted and implemented with the focus on green and ecological tourism, rural culture tourism as well as agro-tourism and leisure through any possible new approaches including transforming agricultural products into value-added tourism commodities and souvenirs, branding and marketing, online pilot e-commerce and internet platforms, etc. This plan spatially emphasized Yanchi town, Zhaitang town and Qingshui town (see Figure 2 for their locations).

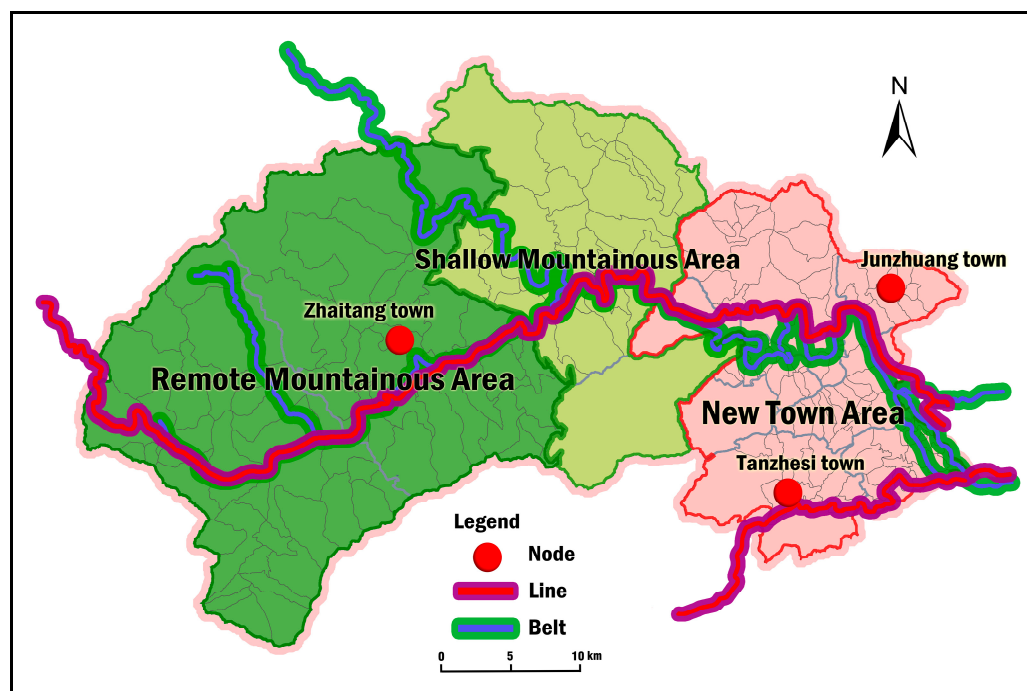


Figure 4. 12th FYP spatial restructuring: 1 belt, 2 lines, 3 nodes, 3 functional zones.

4. Planning Evaluation

As a government-led country, planning systems in China play an extraordinarily important role in its socio-economic development and spatial evolution. By reviewing the planning practices in China in general and Mentougou district in particular, the existing plan set in Mentougou shown above holds several merits as follows: (1) making a blueprint and providing objective-oriented guidelines for Mentougou's short, intermediate and long term local development. For example, Mentougou's strategic positioning as an *ecological conservation district* in Beijing, proposed and reiterated in various plans, has become a fundamental vision and unchangeable mission. As a response to this positioning, nearly all plans selected eco-friendly industries as the pillar, which has been further strengthened in the latest plans; (2) widespread communication and raising awareness of local development. For example, most plans in Mentougou must be publicized and made known to all the stakeholders, including investors, developers and local citizens, so that joint efforts can be made to ensure the plan is more effectively implemented; (3) providing periodical milestones and index systems for monitoring the whole process during the planning period. For example, in each FYP of Mentougou, a set of key indicators were usually generated for monitoring and checking the achievements made within the five years. Such an index system could also be used for comparative studies and showing the development trajectory of the district in a quantitative way; (4) serving as a transition springboard and interface nexus for the next development phase. For example, Mentougou's 10th FYP emphasized urbanization, which became the springboard of the 11th FYP focusing on new countryside construction, while in a similar way, the latter became the starting point for the 12th FYP which stressed the urban–rural balanced development, with the aim to adjust the overheated urbanization in the 10th FYP period and fevered investment in rural villages in the period of 11th FYP.

Like all coins having two sides, there also existed drawbacks in Mentougou's plans by way of the following aspects: (1) priority of objectives fluctuated particularly during the change of leadership which resulted in less consistency between the series of plans. For example, when urbanization and economic development were the first priority for local leaders in the 10th FYP, building material was designated as the first pillar industry in Mentougou based on its comparative advantage of having rich natural resources, however, with the change of leadership who took the eco-tourism as the dominant

thrust for economic development, the former pillar industry of building material was eliminated in the later plans; (2) many new terms or ambiguous concepts were frequently introduced in the plans which created confusion among recipients. For example, such words as innovative, creative, smart, green, ecological, environment, sightseeing, leisure, entertainment, rural, heritage, culture and etc., were frequently used in a confusing or random combination in Mentougou's plans due to the lack of clear understanding of each term; (3) some unrealistic milestone indicators in the plans were nearly impossible to realize due to insufficient systematic analysis and megatrend forecasting. For example, the tertiary industry proportion by GDP proposed in Mentougou's 10th FYP was 66.2% by 2005, while, in fact, by 2015, the corresponding proportion reached only 51% after its continuous efforts in tertiarized transformation; (4) rushing plan making and implementation without full consideration of overall local settings, including local residents' livelihood and actual demands, resulted in huge costs of readjustment for the later stages and future development due to the distortion of forecasts. For example, the original purpose of the valley economy was to improve the eco-environment of mountainous areas and the livelihood of local residents in Mentougou, yet some engineering projects such as dikes or dams in valleys were constructed at that time for the purpose of harvesting rainfall water into a pond or lake and developing aqua-tourism. However, these projects were actually against the concept of *ecological conservation*, and to make things worse, it caused mountain landslides when floods occurred, evidenced by the largest rainstorm disaster ever in Beijing (21 July 2012) over the past six decades, causing 79 deaths throughout the whole municipality.

From a holistic point of view, there exists some rational merits in the thread of planning thought in Mentougou. For example, in terms of spatial arrangement, the district planners had recognized that disequilibrium is the norm and inevitable trend. Then, they intended to reorganize the town and villages following the ideal evolutionary pattern as shown in Figure 5, in an attempt to transform some potential towns and villages into sub-poles or key nodes, such as Zhaitang town designated to be a sub-center of Mentougou and Chuandixia village as a special tourist village based on its strong heritage and rich culture (see Figure 2 for its location).

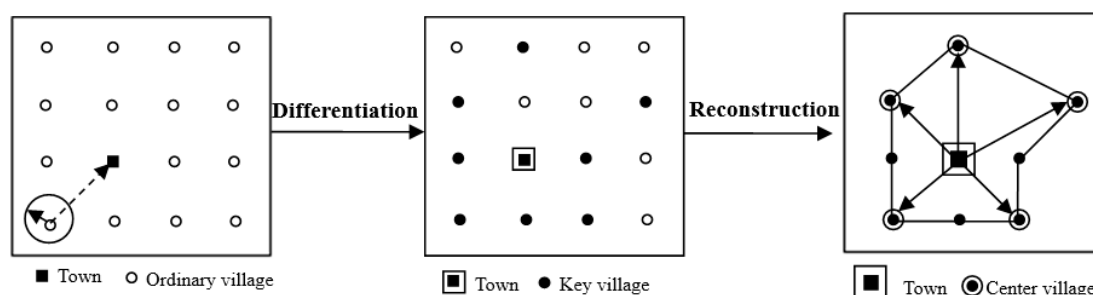


Figure 5. Thread of thought in planning for ideal spatial reconstruction of village.

However, there also occurred much deviation, distortion and ineffectiveness in the implementation and practice of the plans. Most notably, the reality was far from the ideal pattern proposed in the plans. For example, the comparison of populations and incomes among villages between 2007 and 2015 data showed that the population in peri-urban rural villages did not present a large differentiation as expected. Most of the villages shared the similar growth rate of 2.9% during the past 8 years. So did the income per capita among the majority of villages at 4.2%. The possible reasons for the gap between plan and reality could be: (1) there was basically no long-term vision and corresponding consistency, even in strategic planning, resulting in arbitrary changes in orientation over the term of office of local government; (2) generally, the planning intention itself was logical and good in principle but lacking the intended effect in practical largely due to the lack of details differentiated measurements; (3) the even distribution and scattered investment or equal fiscal transfer in rural villages made the situation worse, particularly during the initial rush in the countryside construction

campaign; (4) the lack of resilient buffers without consideration of future uncertainties made the plan itself less adaptable in practice.

Technically, the main reasons for the existing problems and drawbacks in planning mentioned above were the lack of systematic analysis and detailed studies on aspects such as classification of typologies and selection of key nodes, etc. Without a clear classification of typologies, the implementation of some specific targets was normally ambiguous and thus performed less well than expected, although the rough spatial functional division could, to some extent, play a role and exert a certain effect on planning orientation. For example, in the case of Mentougou district, a more detailed analysis of the classification of village typologies could be conducted in the following ways to maximize the performance of the plans.

First of all, based on Nelson Method for classifying the functions of cities and towns [40], the classification of village typologies in Mentougou district could be conducted from four perspectives including their scale of population and land, locational conditions, economic status and potential functions. According to the population and income data of 177 villages in Mentougou in 2007 when most of the plans were made, their average value and corresponding standard deviation could be calculated. Then, the average value plus the standard deviation could serve as the criteria for evaluating the status of the village population and its economy. The villages whose population and economy value reached or exceeded that of average plus one standard deviation could be considered as key villages either with a large population or better performing economy. For those with both a large population and better economic performance could be selected as center villages, as shown in Figure 5.

In addition to the Nelson Method, seven variables for comprehensively evaluating the village typologies in 2007 were collected and analyzed as listed in Table 2. Firstly, a non-dimensional standardization was calculated to make all the variables comparable. Then, a principal component analysis based on these variables was carried out. Table 2 presented the results of this analysis in the form of loading scores on the principal component. Once the loading scores on the principal component had been extracted, they were then used as coefficients in the following equation to generate the comprehensive score for each of the 177 villages.

$$V_i = L_1 \times X_{1i} + L_2 \times X_{2i} + \dots + L_7 \times X_{7i}$$

V_i : the comprehensive score of village i

L_n : loading score corresponding to variable X_n

X_{ni} : value of variable X_n for village i

Table 2. The evaluation of variables and their sorted loading scores.

Variables	Description	Loading Score
1. Total income	Village economic level	0.7431
2. Income per capita	Farmers' income leve	0.7236
3. Population density	Population per km ²	0.6274
4. Total population	Hukou populatio	0.5617
5. Construction area	Construction land use	0.4624
6. Total area	Village territory	0.4367
7. Distance to urban	Distance to the nearest urban node	−0.6452

Note: Variables 1–4 were compiled from Mentougou Statistic Yearbook, 2008; variable 5 was from local land use plan [41]; variable 6 and 7 were calculated by GIS tool.

At last, by use of GIS tool (ArcMap 10.2) for spatial analysis, the comprehensive score of each village was analyzed and its typology was determined based on its potential functions. According to the analysis, the 177 villages could be classified into three typologies, i.e., *restructuring by urban expansion*, *in-situ development by rurality* and *relocation by ecological conservation* (Figure 6). Following this classification, further comparison analysis and customized strategies could be conducted, as shown in Table 3. It could be seen from the table that each typology had a specific development strategy.

For example, for villages in typology of restructuring by urban expansion, their development strategy heavily relied on the balanced development between urban and rural areas; in other words, how to better integrate these peri-urban villages into urban areas by taking advantage of urban spill-over effects was the focus to ensure their sustainable development.

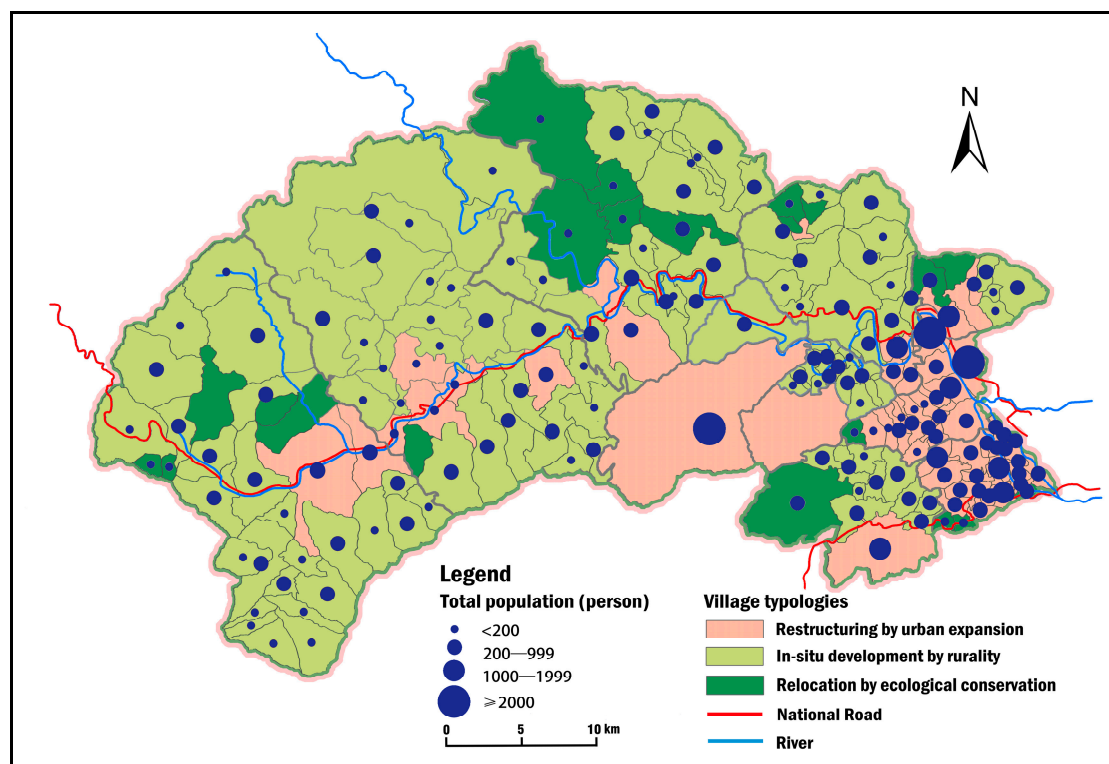


Figure 6. Distribution of villages by typologies in Mentougou district.

Table 3. Comparison of development strategies of peri-urban villages by typologies.

Typology	Location	Scale	Industrial Structure	Driving Force	Development Strategy
T1 *	Near urban built-up areas	Medium to large	Non-agriculture dominated	Urban expansion and spill-over effects	Promote the balanced development between urban and rural areas
T2	Along major corridors	Small to large	Agro-rural tourism dominated	In-situ bottom-up rural urbanization	Develop agro-rural tourism by improving infrastructures and public services
T3	Remote areas	Tiny to small	Eco-tourism dominated	Ecological and environmental protection	Encourage out-migration by providing jobs and accommodation

Note: * T1 for village typology of Restructuring by urban expansion; T2 for village typology of In-situ development by rurality; T3 for village typology of Relocation by ecological conservation.

The 2007–2015 population and income per capita compound annual growth rate (CAGR) of three typologies of villages in Mentougou district classified by authors (Table 4) showed that: (1) Hukou population CAGR in T1, T2 and T3 for 8 years, respectively, reached 2.7%, 2.8%, 3.0%, indicating that the further villages were away from urban areas, the larger the increase in Hukou's population would be. The possible reason was the tighter restriction of Hukou registration in T1 villages due to its much higher income per capita, and thus any new Hukou registration usually would be rejected by local villagers for safeguarding their existing welfare (decisions were usually made by local committees collectively in China's villages), while in T3 villages, Hukou registration was flexible and local villagers

often embraced newcomers. However, the actual permanent population in T1 villages would be much higher because of their locational advantages in fast urbanization processes, attracting more urban migrants renting homes there.

Table 4. Hukou population and income per capita CAGR by typologies (2007–2015).

Typology	Number of Villages	Hukou Population 2007 (Person)	Hukou Population 2015 (Person)	Income per Capita 2007 (RMB/USD Thousand) *	Income per Capita 2015 (RMB/USD Thousand)	Hukou Population CAGR % 2007–2015	Income per Capita CAGR % 2007–2015
T1	54	30,932	38,303	181.8/28.0	156.0/24.0	2.7	−1.9
T2	106	30,924	38,557	51.6/7.9	68.8/10.6	2.8	3.7
T3	14	2960	3762	61.3/9.4	78.6/12.1	3.0	3.2
Total	** 174	64,816	80,622	114.2/17.6	110.7/17.0	2.8	−0.4

Note: * The currency exchange rate in the table adopts 6.5 RMB (Renminbi, Chinese Yuan) = 1 USD (US Dollar).

** Number of villages in Mentougou district increased from 177 in 2007 to 178 in 2015, of which 4 villages had no data available in 2007.

(2) The average income per capita CAGR for 8 years was −0.4%, of which T1, T2 and T3 villages were −1.9%, 3.7% and 3.2%, respectively, indicating that T2 villages enjoyed the most rapid growth rate while T1 villages even had a relatively high minus growth rate. The possible explanations were that, for T1 villages, the growth rate could be substantially underestimated due to the fact that many local villagers working in urban sectors were reluctant to have their actual payment officially recorded by authorities, nor as the income obtained from housing renting. For T2 villages, their highest growth rate in income per capita may be attributed to the following two aspects, one, most relocated industries were transferred here from urban areas, generating more opportunities and profits for local villages; two, in-situ agro-tourism was becoming increasingly popular, therefore bringing higher income to villagers as well. This second reason was also applicable to the situation of T3 villages.

Based on the above analysis and comparison, it is proved again that, as we mentioned above, the planning did have a positive effect or influence on the development of spatial dynamics and functional divisions by the classified typologies of villages in Mentougou district. However, the planning performance could have been better if a well-classified typology and selection of key nodes within each typology was conducted in advance based on systematic and detailed studies during the pre-planning stage.

5. Conclusions

The quick and critical review of key plans in Mentougou district in this paper shows that the set of plans together generally plays a positive role and could be more positive if all the listed plans in Table 1 were fully implemented. The positive roles particularly lie in the guiding of development orientation, such as the urbanization theme in the 10th FYP, the focus on new countryside construction in the 11th FYP and the promotion of urban–rural balanced development in the 12th FYP, as well as some customized plans for specific fields such as agro-tourism, rural cultural development, land use functional zoning, spatial arrangement and ecological conservation in peri-urban valleys, which enable local governments to promote rapid and more dynamic development in this regard.

However, by carefully exploring the planning practices of Mentougou district in the past 15 years, it can be seen that the full realization of the plans is yet to be achieved. This explicitly implies that there definitely exists a lot of room for improvement in many aspects. Manifested in Mentougou district and other parts of China alike, the most serious problem in planning overall is the lack of effective coordination of different planning systems and limited cooperation among various agencies or bureaus. As shown in the case of Mentougou—a typical peri-urban district dominated by an ecologically fragile mountainous landscape and dwarfed by the super-giant of Beijing municipality in overall capacity—the underperformance of its plans is due to the following reasons:

(1) *Lack of initiative and innovation at local level.* Given its local government has limited authority and a lack of initiatives or innovative ideas, the planning practice usually follows the routine process guided by the upper level government, which refers to the Beijing municipal government in Mentougou's case. The district planning basically follows the tune set by the municipal plan rather than making its own plans customized to the local characteristics and features of the area and the priorities identified through systematic and detailed studies and research.

(2) *Lack of long-term vision and consistent implementation.* Given that development is dominated by a government-led approach, and the local government terms of office suffer from their relative shortness, it is nearly impossible to realize long-term visions, let alone ensure they are implemented consistently. In the case of Mentougou district, there are no plans with a planning period longer than 30 years although the land use plan can cover 15 years. By doing so, impromptu changes can be made during the planning implementation process, and investment is likely to chase only the short-term interests, resulting in the scattered layout of industries and infrastructure in most situations.

(3) *Lack of rationale-oriented approach.* Given China's traditional culture of "power monopoly by the top leader" and being reinforced constantly by path dependence, individual preference always matters and dominates in decision making at all levels of governments, resulting in an arbitrary-oriented rather than a rationale-oriented planning process. In this way, planning gives way to either slogans or eye-catching visual presentations which are difficult to follow and effectively implement. The intrinsic nature of planning in promoting public welfare and equal services can be weakened or neglected while the majority of profits can go to some small interest groups instead of mass society. In the case of Mentougou district, some ill-planned engineering projects were implemented in the valley without much consideration of ecological conservation or local villagers' security, possibly causing the disasters, including mudslides and floods, that occurred in Beijing in 2012.

(4) *Lack of scientific and in-depth research accumulation.* Given the lack of academic research and continuous in-depth scientific thinking, the plans are often made in a rush in most cases without enough understanding of local contexts, regional patterns and national strategy. In terms of best practice study for the purpose of benchmark comparison, most plans usually present superficial descriptions of the cases rather than explore the transformative messages underneath. While in terms of new concepts, many plans often just verbally copy the relevant terms without thoroughly understanding their connotation and denotation. As a result, most plans are rich in wordy expressions yet shallow in real meaning for application. In Mentougou's case, many terms in plans are used in an ambiguous and repeated way across different types of towns without considering the individual village's conditions and the local settings. For example, the term "cultural innovation industry" is used pervasively in the plans for most towns in the three functional areas, but it is obviously not an appropriate pillar industry for everywhere.

(5) *Lack of multi-stakeholders participation.* Given China's government somehow plays an omnipotent role in policy making for all-around development, which is further reinforced by the institutional arrangement of land state ownership, legally other stakeholders have less eligible rights and power to participate in planning and regulation making. Meanwhile, there exists the asymmetric information problem without much transparency in which most stakeholders cannot access or obtain timely information through official channels. Their involvement is thus less active without having a sense of ownership and enough information. In peri-urban areas like Mentougou district, the situation is even more complicated as the dual land system sometimes endows the village committee with a large amount of power in determining land uses. Besides, most plans are done by semi-official teams with rigid thoughts, creating a lot of repetition in spatial structures and redundancy in planning instead of putting forward innovation-led process based on new situations and local development stages. To make things worse, professional management in planning is not very independent but heavily influenced by government terms.

Therefore, to establish an integrated and implementable planning framework scheme is badly needed, especially for peri-urban regions as in the case of Mentougou district to promote sustainable

development of rural settlements. Based on the case study, a good plan should be a systematic holistic scheme which includes the following indispensable components and elements, i.e., long-term vision, visionary mission, strategic positioning with SWOT (Strength, Weakness, Opportunities, Threats) analysis, classification of typologies, division of labor and spatial function, selection of key nodes as sub-pole-to-be in each typology, migration and spatial interaction, land use zoning, human-centric innovative town or village community design featuring smart technology and fine grid road networks with good accessibility, cultural-richness, high sustainability with better management and governance under constant institutional reform. Particularly for a peri-urban district like Mentougou, the planning and its implementation should give emphasis to the following three aspects, i.e., how to enhance local initiatives and innovation based on local conditions and long-term vision; how to build on scientific in-depth research by rationale-oriented approaches that provide a good basis for planning; how to make sure all the stakeholders are engaged in the process in a more independent way.

For Mentougou itself, disequilibrium should be the acceptable new norm as the important premise for its sustainable development rather than chasing equal investment everywhere in assuming that development potential is ubiquitous. Therefore, the local efforts should concentrate on selecting and nurturing some culturally-anchored nodes or sub-pole development in a place with good locational advantages and special functions. For the remote rural areas, nature's self-restoring capacity should be encouraged instead of giving precedence to planned engineering projects, and natural demographic decline in villages should be welcome for mitigating human being's negative impact on local ecological systems.

The good news is that the above-mentioned suggestions for planning improvements have been increasingly recognized by all levels of governments, as can be generally seen from the 13th FYP (2016–2020) in which quality development with more careful spatial arrangement is aspired to. For example, Mentougou district has upgraded its positioning from *ecological conservation district* to *ecological garden and backyard* of Beijing. Spatially, a clearly stereo development pattern of node-corridor-area (Figure 7) was introduced for Mentougou's three functional areas, i.e., remote mountainous area, shallow mountainous area and new town area, respectively.

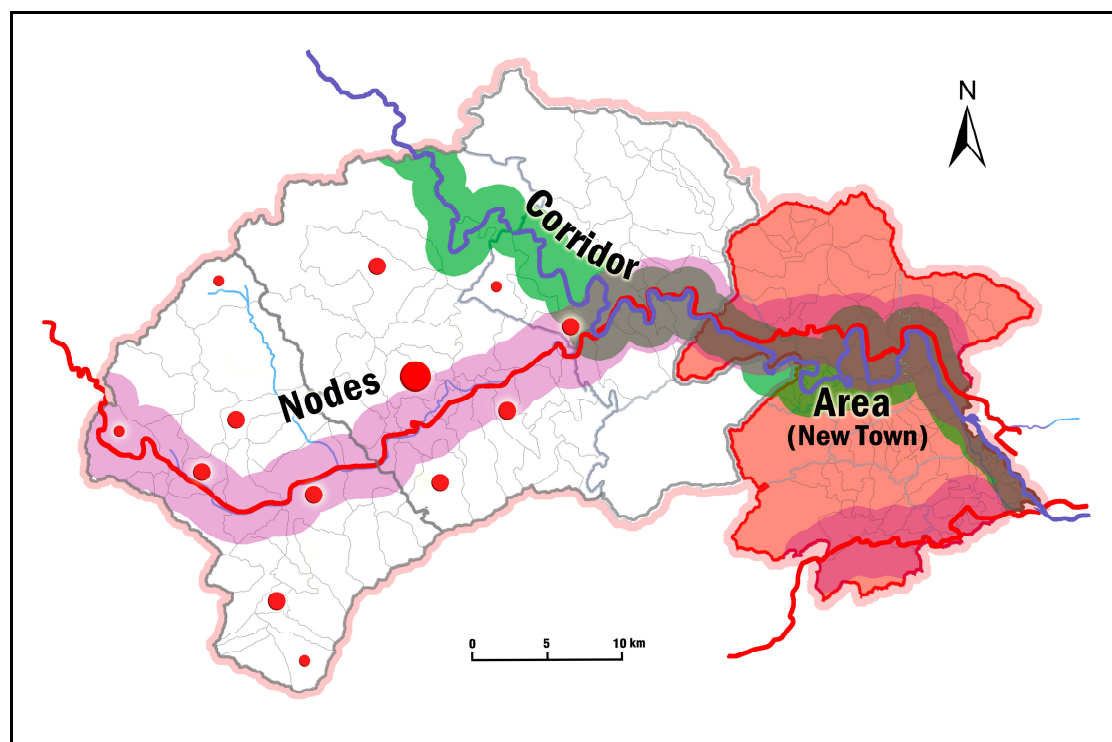


Figure 7. 13th FYP spatial restructuring: node-corridor-area development pattern.

In addition, having recognized the importance of customized planning for each local village for its sustainable development, the central government called for a top-down movement in 2013 focusing on special planning for rural heritage settlement dubbed as the “One village, one plan” campaign. Following this, all levels of governments began to take actions. In case of Beijing municipality, 52 culturally-rich traditional villages were designated for the campaign, of which 13 villages already completed their plans by the end of 2015. Of the completed plans, three were approved by Beijing municipal government, i.e., two villages of Chuandixia village and Liuliqu village in Mentougou district and one village of Shuiyu village in Fangshan district (see Figure 2 for their locations), another peri-urban district of Beijing immediately south to Mentougou. It will be interesting to see how well these plans can be aligned with the proposed classification of typologies, which can be tested and evaluated after they are implemented in some years.

6. Discussion

In order to advance the field of planning in China, more in-depth academic and applied research is needed. As peri-urban areas are most dynamic and complicated areas filled with acute challenges, and present the main battlefield and platform for reshaping China’s new urbanization approach, any planning studies that assist in its sustainable development are especially needed, and form part of a paramount research agenda, at least in China. Specifically, the agenda should focus on some key topics, including urban–rural balanced development through strengthening urban–rural linkages and improving the interface nexus to capture urban spill-over effects; dynamic mechanisms and optimized patterns for multi-functional peri-urbanization through diversified stakeholders’ participation, including innovative financing such as PPP (Public Private Partnership) and institutional reforms; rural sustainable development from cultural perspectives with an emphasis on rural settlement restructuring by taking advantages of local heritage, agro-tourism, natural landscapes, traditional architecture, even including human-centric settlement construction based on *geomantic theories (fengshui)*, and the Chinese traditional wisdom on human settlement spatial arrangements oriented to harmonious development between man and nature at the local scale. More international best practices and comparative studies are also urgently needed and invited. In this sense, this paper may serve as a kick-off study for further discussion.

It is never an easy job to conduct planning assessments and evaluations. So far, there has been no widely recognized methodology in academic society to conduct such a task in a systematic way. The practice in this paper was just a preliminary exploration and trial for undertaking the initiative. The research paradigm used here was simple and effective, particularly for the very case of Mentougou, yet it could be further improved if applied to other peri-urban areas. For example, it would be much better if the full aspects of planning could be identified from the very beginning so that a comprehensive and comparable framework could be constructed for planning reviews and evaluations in a systematic way. Perhaps, the practice of classification of typologies could also be implemented before the planning evaluation takes place so the performance of planning can be known in more detail to support further in-depth research, which in turn can enable users to formulate better, more customized policy recommendations. Another improvement may lie in the better presentation of results in such a way that readers and users can quickly grasp the essence of the planning evaluation outcomes. Therefore, international joint efforts to further develop a more effective methodology for planning evaluations are needed.

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