sustainability

MDPI

Review

Dynamic of Regional Planning and Sustainable Development in the Pearl River Delta, China

Yutian Liang [1,2,3,4], Zhengke Zhou [1,*] and Xun Li [1,3]

1 School of Geography and Planning, Sun Yat-sen University, Guangzhou 510275, China; lytian@mail.sysu.edu.cn (Y.L.); lixun23@126.com (X.L.)
2 Guangdong Key Laboratory for Urbanization and Geo-simulation, Sun Yat-sen University, Guangzhou 510275, China
3 China Regional Coordinated Development and Rural Construction Institute, Sun Yat-sen University, Guangzhou 510275, China
4 Southern Laboratory of Ocean Science and Engineering, Zhuhai 519000, China
* Correspondence: zhouzhk5@mail2.sysu.edu.cn

Received: 26 September 2019; Accepted: 29 October 2019; Published: 1 November 2019

Abstract: Since the reform and opening up, China has been embedded in global economy. As one of the fastest developing regions, the Pearl River Delta in South China has rapidly developed from an agriculture-based region to a world factory and is subsequently becoming a global innovation center. In the process of rapid development of globalization, marketization and decentralization, how the planning theory and planning concept are applied in this region? And how does the planning adapt to the needs of development to do the space regulation? This paper combs the previous regional plannings of the Pearl River Delta, analyzing how to effectively guide and reshape the sustainable development space under the background of land and space disorder. Four key conclusions emerge from this review. First, the concept of planning has been developing from incremental planning to stock planning. Second, there is a transformation of planning contents that is from building of an economy-oriented production space like industry park planning, to improving quality of the living space and providing environment-friendly ecological space such as greenway planning and quality living circle planning. Third, the upgrading of planning technological means is reflected in the change from expression of concept articles to visualization of big data. Fourth, it shows an obvious change from rigid governance to flexible and multi-scale governance.

Keywords: regional planning; the Pearl River Delta; urbanization; sustainable development; space governance; regional integration

1. Introduction

Since 1978, the Pearl River Delta region (PRD) of Guangdong province in China (Figure 1) has been a representative of the "growth miracle" around the world. It has provided rich experience for industrialization and urbanization under the background of global industrial transfer and China's reform and opening up [1]. In a few decades, the once backward region has rapidly grown into a world-renowned manufacturing base—"world factory" [2]. Now with a new round of industrial transfer coming, the local government is promoting the "Double Transfer" policy to make good progress in industrial upgrading [3]. The PRD is gradually developing to a global innovation center [4].

Under the background of globalization, marketization and decentralization [5], how the planning of PRD adapts to the needs of rapid development? Since 1989, six rounds of regional plannings as well as several special plannings have been carried out in the PRD region. Under the volatile circumstances of opening up, tax reform and economic crisis, the planning of PRD has been in the forefront of the

country, and made many pioneering explorations [6]. On the one hand, there are micro-scale urban and rural plannings and special plannings focusing on green space, transportation network, industrial space and other topics [7–10]. On the other hand, there are regional plannings for regional integration on regional scale. However, how the planning theory and planning concept are applied in PRD has not been sorted out and summarized. Meanwhile, with the gradual implementation of reform and opening up, institutional and economic foundation, as well as external environment have changed [11]. How does the PRD regional plannings adapt to rapid industrial development? How to deal with the rapid loss of land resources? How to improve the rapidly deteriorating ecological environment? How to meet the rising needs of the people? How to adapt to rapid scientific and technological progress? How to adapt to the increasingly urgent regional integration trend? These are topics that have not been fully explored. Currently, the Belt and Road initiative has become an important starting point for China to cope with the adjustment of world pattern and economic globalization [12]. Guangdong-Hong Kong-Macao Greater Bay Area also has been upgraded to the national development strategy, which means that the PRD region is already in an important period of transformation. Looking back on the reform and opening up in the past 40 years and making clear the track of regional planning transition will help us grasp the opportunities in the new round of industrial transfer and realize sustainable development. In addition, as a representative developing area in developing countries, the planning experience and practice of PRD will be of great reference value to other developing countries and regions.

This paper provides a critical literature review of PRD plannings and planning studies in terms of the above issues. After an introduction of the research data and method, based on the perspective of historical evolution, we comb and summarize the plannings and planning literature of PRD from four aspects: planning concept, planning content, planning means and planning governance (Figure 2). The conclusion and discussion section gives a brief summary of the main findings and put forward some recommendations for future studies.

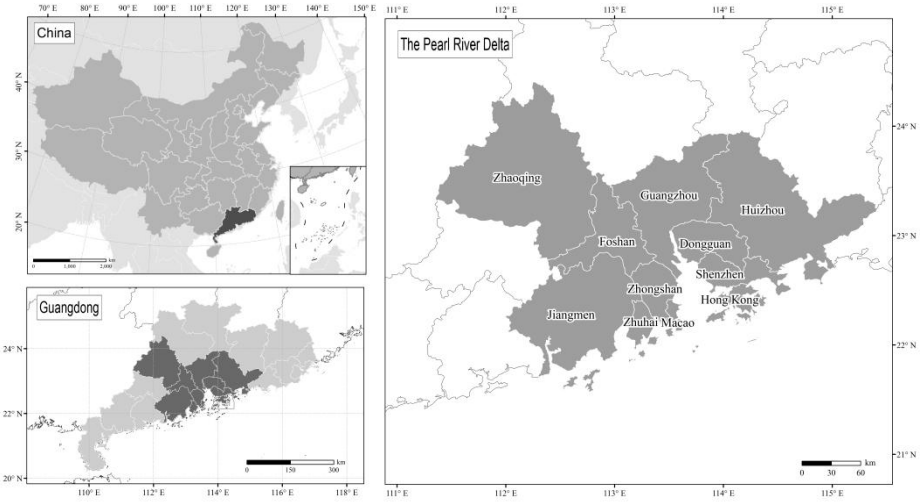

Figure 1. Location of the Pearl River Delta.

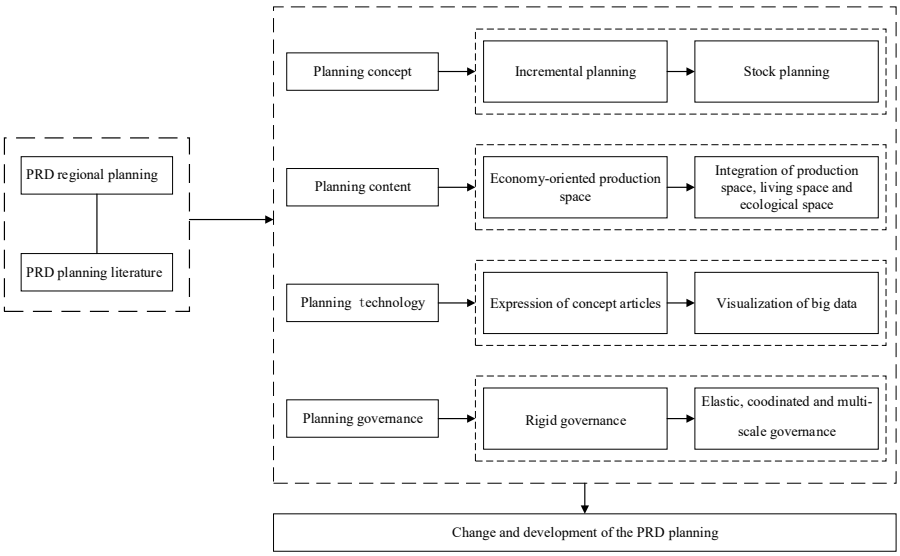

Figure 2. Conceptual framework of the article.

2. Data and Methodology

The reviewed papers mainly come from the core database of "web of science" and CNKI (China National Knowledge Infrastructure) database. The key words used in literature filtering include "Pearl River Delta" and "Planning" in the SCI (Science Citation Index) and SSCI (Social Science Citation Index) database. At the same time, the literature types were limited to "Article (157)" and "Review (5)". Finally, a total of 162 articles were retrieved with a time span of 1986–2018. We also searched key words, "Pearl River Delta (zhu san jiao)" and "Planning (gui hua)", in CNKI database and limit journals in "City Planning Review", "Planners", "Urban Planning Forum", "Urban Planning International", "Modern Urban Research", "Scientia Geographica Sinica", "Acta Geographica Sinica", "Progress in Geography" and "Geographical Research". These journals are authoritative in China's geographical and planning circles. Along with the search rule, the time span of the selected papers is from 1978 to 2018. 96 articles were retrieved finally after deleting the papers missing author's information. This paper focused on 116 of the 258 articles after further screening and 13 Pearl River Delta regional planning reports (Table 1). The distribution of the 116 papers in various scholarly journals is shown in Figure 3.

Table 1. A portion of regional plannings in the Pearl River Delta region (PRD) since 1980 to present.

Year	Name
	Six rounds of regional plannings
1989	Urban system planning in the Pearl River Delta of Guangdong province (1991–2010)
1994	The planning for urban agglomeration of Pearl River Delta economic region
2004	PRD Urban Cluster Coordinated Development Plan (2004–2020)
2008	Outline of the Plan for the Reform and Development of the PRD (2008–2020)
2014	The PRD Region Plan (2014–2030)
2019	Outline Development Plan for the Guangdong–Hong Kong–Macao Greater Bay Area
	Other special or related plannings
1992	Urban system planning in Guangdong (1992–2010)
2001	Urban agglomeration development planning in the Pearl River Delta
2007	Study on coordinated development planning of urban agglomeration in the Greater Pearl River Delta region
2009	The key action planning for the construction of the livable Bay Area in the Pearl River Estuary
2009	Integrated planning for urban and rural development in the Pearl River Delta
2009	Special planning for building a high quality life circle
2010	Outline of overall planning for greenway network in Pearl River Delta

Source: Authors summary from the regional plannings listed in Table 2.

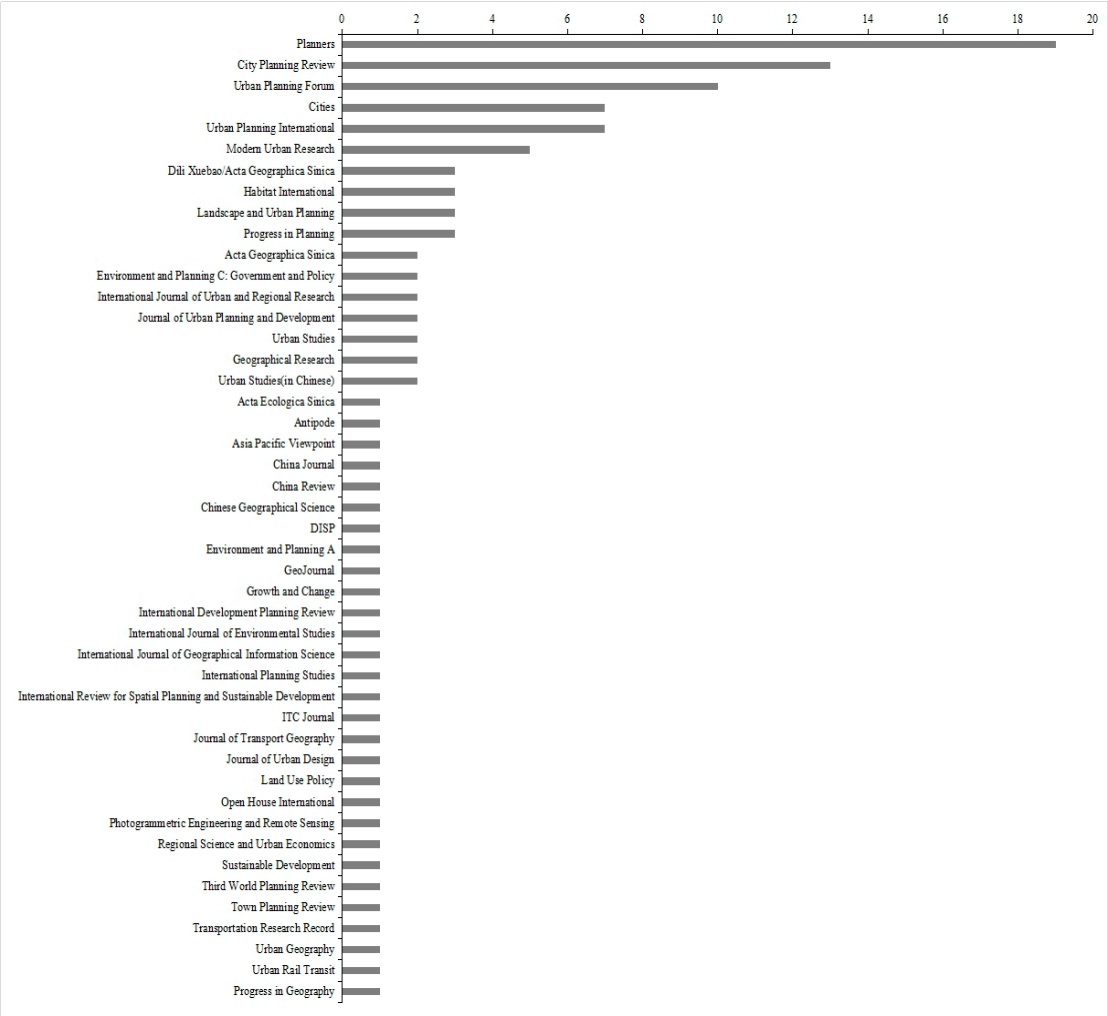

Figure 3. Distribution of the selected papers in journals.

3. Evaluation of Regional Plannings in Pearl River Delta

3.1. Change of Planning Concept

In the 1980s and 1990s, with China's reform and opening up and the approval of the establishment of special economic zones in Shenzhen and Zhuhai, the economy of the PRD region has developed rapidly. Great changes have taken place in the economic structure and brought about a rapid urbanization process [13]. In order to adapt to the rapid industrial development and rise of small and medium-sized towns, Guangdong Province issued "the Pearl River Delta Urban System Planning", hoping to build an ideal urban system to promote urbanization and industrialization. The plannings and development activities in this stage are called as "planning for growth" by Wu [14]. Meanwhile, there has been worldwide concern about sustainable development since the publication of the Brundtland Report in 1987. A consensus on the importance of sustainable development has been reached in the Rio Earth Summit in 1992, which promoted preparation of Agenda 21 [15]. With the increase of automobiles and highways, a series of urban diseases were caused by urban sprawl in the 21st century in PRD [16]. In response to these urban issues, scholars have put forward many new concepts from the planning perspective. For example, some scholars have proposed that we should adopt the concept of "Smart Growth" to restrain the trend of urban sprawl, and pay more attention to the quality of growth [16]. Based on the case studies of the United Kingdom (Greater Manchester) and China (PRD), some scholars pointed out that the traditional development model had obvious shortcomings, which were reflected in the subsequent planning concept. In the case of Greater Manchester, scholars

pointed out that a range of serious environmental defects add to the list of work to be done before the city region can really begin to function as a sustainable entity. Such tasks imply an additional expense for the present generation in order to rectify the errors of the past. In the PRD region, whilst the policy priorities of the immediate past and present have emphasized the creation of employment and economic growth, the environmental consequences of such policies have not been incorporated in development strategies. As a consequence, the costs of repairing environmental damage will fall upon future generations [17]. Therefore, they proposed the introduction of more sustainable regional planning methods, such as ecological modernization, which implied the need to change attitudes to promote sustainable strategies and improve the means of implementation [17]. In addition, the principle of landscape ecology has been introduced into urban ecological planning to provide a theoretical framework. The coordination and unification of urban and regional landscape functions become an important part of regional plannings in PRD [18]. Besides the scopes of sustainability that focus more on resource utilization or ecological/environmental balance, some scholars shed the light on the geography of regional economic sustainability [19]. For planners or policymakers, it is important to identify the trade-off of globalization between rapid economic growth and resilience so as to have a more critical understanding of sustainability in the process of economic catching-up [19].

Another important conceptual change is from incremental planning to stock/inventory planning. The rapid industrialization, urbanization and population explosion have ushered in the era where focus is on the efficient use of land resources to achieve sustainable development [20]. It is commonly recognized as of paramount importance in balancing the protection of farmland and the accommodation of socio-economic development to improve the efficient use of land, especially for a country like China with intense human-land relationship [21]. Generally, land-use expansion has two forms, namely, "endogenous form" referring to expanding laterally on the land-use scale and "exogenous form" referring to the intensifying land use [20]. Planning and design approaches affect land use efficiency [21]. Over the past 40 years, the incremental development model, which focuses on the development of new towns and new parks, has been the main idea and path of PRD's regional plannings. Although it has been effective in promoting urban economic development, it also has brought about extensive land resources development and deterioration of ecological environment [22,23]. Moreover, land resources are limited, and the incremental development model is not a sustainable development model [24]. As the contradiction between urban land demand and supply becoming increasingly tense, the concept of stock/inventory planning is gradually accepted [22,23,25,26]. Zou [22] introduced three typical cases of Shenzhen in the Annual National Planning Conference 2012, and analyzed three different types of planning: increment planning, inventory planning and policy planning comparatively from conceptual connotation, typical characteristics and working emphasis. It emphasized the transformation from incremental planning based on spatial expansion to stock/inventory planning through urban renewal to optimize and adjust the functions of built-up areas.

Generally speaking (Table 1), with the transformation of economic development model and the emergence of various ecological problems in the process of regional development, the concept of planning in PRD region has been developing towards sustainable, ecological and coordinated planning. A consensus that we should move from incremental planning to stock/inventory planning has been reached.

3.2. Transformation of Planning Content

Since the reform and opening up, the PRD region has undergone several rounds of regional plannings (Table 2). As Gu et al. mentioned, China's master planning practice is divided into four stages: socialist master planning and anti-planning (1949–1978), reforming master planning (1979–late 1980s), urban development planning (early 1990s–2000) and comprehensive planning (2001–present) [27]. Since the 1990s, there is an obvious change that is from a relatively single spatial layout planning, mainly focusing on economic development, extending to social, environment, urban landscape, quality of life and other aspects from the perspective of planning content in PRD. In addition,

there is a transformation that is from economic development-oriented production spatial plannings to comprehensive plannings integrating innovative high-tech production space, high quality living space and environment-friendly ecological space. That is to say, urban and regional planning was used as a spatial tool for local governments to meet the needs of urban production. Due to political, economic and social development, planning needs to address issues such as environmental sustainability and social equity. A new trend in urban and regional planning in China is the establishment of a framework for "ecology-living-production spaces" [27].

Table 2. Contents of historical versions for regional planning in PRD.

Planning and Time		Urban System Planning in PRD (1989)	The Planning for Urban Agglomeration of Pearl River Delta Economic Region (1994)	PRD Urban Cluster Coordinated Development Plan (2004–2020)	Outline of the Plan for the Reform and Development of the PRD (2008–2020)	The PRD Region Plan (2014)	Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area (2019)
Spatial planning	Town system planning	√	√	√	√	√	√
	Infrastructure layout	√	√	√	√	√	√
	Industrial layout guidance	√	√	√	√	√	√
Society, economy and ecology	Social undertakings	-	√	√	√	√	√
	Resources and environment	-	√	√	√	√	√
	Urban and rural coordination	-	√	√	√	√	√
	Regional coordination	-	√	√	√	√	√
Planning and implementation	Action plan	-	√	√	√	√	√
	Space control	-	√	√	√	√	√
	Implementation mechanism	-	-	√	√	√	√
	Development control	-	-	√	√	√	√
Other	City scape	-	-	-	√	√	√
	Central city development and guidance	-	-	-	-	√	√
	Public participation	-	-	-	-	√	√
	Big data application	-	-	-	-	√	√
	Risk prevention	-	-	-	-		√
	Platform construction	-	-	-	-		√

Source: cited from Lai (2015), modified by authors.

3.2.1. Production Space

From the perspective of production space, industrial layout is the key content of PRD regional planning. Since the reform and opening up, the industrialization and urbanization of PRD have maintained a high-speed development for a long time and achieved remarkable achievements. This is partly due to a series of plannings that focus on industrial development. However, on the one hand, early industrial park plannings did not attach importance to the combination of production space and living space, and many problems of "separation of production and city" appeared [28]. On the other hand, the rapid growth of township enterprises and the rapid increase of foreign investment in PRD region have led to the rural urbanization [13]. This contrasts with the concentration in large

metropolises or economic core regions found in most less developing countries [29]. A transitional type of land use mixed between urban and rural areas have been formed spatially. Scholars called it "Desakota" (mix of village and town areas) [30,31]. It is based on the reflection and discussion of these current situations that the integration of production and city has gradually become an important part of urban and regional plannings. Through the study of domestic development zones from an evolutionary perspective, industrial zones generally experience a process from pure industry, to industry integrated supporting functions, to comprehensive new towns. The "integration of production and city" essentially reflects the trend of planning from functionalism to humanism [32]. In addition, with the rapid development of high-tech industry and economic globalization, the PRD is undergoing transformation and some new trends have emerged, including the rise of university towns, the globalization of industries, and the construction of high-tech development zones. Applying the theory of "spatial production" of neo-Marxist, scholars divided the history of the strategic areas in PRD into three stages: industrialization-oriented (from 1978 to the end of 1990s), urbanization-oriented (Since 2000s) and innovation-driven (new period). Under the background of traditional industrialization and urbanization encountering bottlenecks, all kinds of "innovation space" will be the focus of the strategic areas' development in the future [33]. Some scholars believe that with the transformation of economic growth from relying on the low level production elements to high level production elements, the regional policies of PRD should be developed accordingly. For example, making plans to prohibit the blind construction of innovation space, attracting overseas talents to establish talent pools, working out preferential policies to absorb more capital and formulating the policy of attracting a cluster of industries to speed up industrial upgrading [34].

3.2.2. Living Space

The living space in the regional plannings of PRD is mainly reflected in urban and rural construction [35–39]. Urban–rural integration has always been an important issue in PRD regional plannings, mainly reflected in two aspects. Firstly, it is about the discussion of "Urban Villages". Since the economic reform in 1978, China's unprecedented urbanization has engulfed many rural areas under expanded urban jurisdiction. Due to the collective ownership of land, these villages did not disappear overnight. Instead, they have managed to bypass planning and construction rules rebuilding themselves into dense communities that accommodate millions of immigrants in cities [40]. In this regard, the urbanization patterns in PRD transcend traditional standards and definitions of a city: fragmentation of rural residential areas mixed with urban high-rise buildings, rural areas interspersed with industries, formal and informal planning systems coexist [41]. Although most of its population is still officially classified as "agriculture", the region has been a spatial focus of industrial and commercial development [42,43]. However, urban villages are usually associated with poor housing construction, inadequate infrastructure, serious social chaos and unsanitary living environment. By observing the public space and night activities of three urban villages and using ArcGIS to establish the temporal and spatial distribution patterns of these activities, it is found that seven types of public spaces in urban villages are fragmented and blurred. There is a severe lack of public facilities and management methods, which are also not standardized [44]. Under the ubiquitous situation that difficult to obtain incremental construction land, the PRD region began to promote the "Three-Old (non-agricultural villages, old factories and old urban district) Remaking" to activate inefficient construction land [45]. However, as the government still lacks a scheme for social housing provision, there are both social and economic risks associated with this policy. The social and economic impacts of the upheaval of urban villages could become increasingly difficult challenges for policy makers in China. Such issues can only be explored through longitudinal analyses [46]. Secondly, it is about the planning and development of the rural areas in PRD. There are many case studies on rural planning from western countries, for instance, in England, the scholars concluded that land-use decision-making should have a strong local community influence based on local knowledge and evidence rather than top-down rhetoric and assumptions, and there should be more proposals based on a fuller more integrated notion

of rural living [47]. Combining with the process of rural industrialization and urbanization in PRD, we can see that the rural areas of PRD have their unique development characteristics. By summing up the characteristics of duality and inefficiency in rural area, some scholars have studied the trend of rural transformation and a series of crises experienced in traditional rural areas. Influenced by the rural planning experience in western countries, the response of urban and rural plannings to these problems includes: delineating rural control lines, compiling rural development planning, integrating rural areas into regional leisure network through the construction of "rural cultural greenway" and building interactive rural plannings and construction systems [7,48]. However, as many scholars argued, some policies are in essence a top-down rural development strategy based on state intervention, and like many similarly top-down strategies attempted in Europe and elsewhere, it has encountered resistance when sufficient time has not been devoted to enrolling local actors [47,49]. Learning from European experience by incorporating elements of 'bottom-up planning' into the strategy, along with reforms to collective land property rights, could help to secure the successful enrolment of local actors, safeguarding farmers' rights and mitigating against rural protests [49]. In addition to government intervention, market, as one of the criteria of resource allocation, is involved in urban and rural plannings, which is also of great significance to improve the rationality and operability of the planning [50].

3.2.3. Ecological Space

The discussion is more enthusiastic about resources, environment and ecology. The results show that with the rapid development of industry and cities in PRD, the water environment quality has been significantly affected. Pollution causes a decrease of water quality, degradation of ecosystem and also impedes economic development [17]. Some studies have proposed a series of specific measures to protect the water environment, including carrying out environmental functional regionalization, controlling the total amount of pollutant discharge, revising the industrial structure and so on [51]. As regional planning pays more and more attention to the protection of urban ecological environment, the principle of landscape ecology is introduced into plannings. The combination of urban landscape functional planning and landscape structure planning has become a major issue in PRD's regional plannings [18]. However, as two important aspects of planning, there is a mismatch between the construction of transportation network and the protection of ecological environment. Scholars have proposed some amendment suggestions to the overall framework of regional plannings. The goal is to combine the final scheme of traffic-oriented spatial development with the eco-environment planning based on the ecological urban design [52]. After that, greenway planning has become the highlight and hot spot of PRD plannings, and has been in the forefront of all regions in China. Actually, greenways have a long history, at least 3000 years, and include ceremonial avenues, boulevards, parkways, park belts and green belts [53]. In America, greenways, defined as "linear open spaces", were to provide connections between human settlements and the natural environment [54]. While in Europe, greenways were developed in two contexts and had distinct functions, namely to conserve ecological infrastructures by incorporating them into an ecological network, and to provide safe and quiet routes through parks, green spaces and streets [55,56]. At the beginning of 2010, the construction of PRD greenway was started in Guangdong province. After the completion of the task of "Basically completed in one year", some problems were pointed out in the design, construction and management of PRD greenway. Scholars put forward four suggestions: (1) classifying and phasing to achieve high-quality construction; (2) giving priority to ecology and improving the quality of greening; (3) perfecting matching systems and strengthening safety management and (4) government-led, and putting forward social co-construction [57]. Greenway as an important means of ecological protection has developed rapidly. Under the actual conditions of habitat fragmentation, greenway as a multi-functional aggregate is very effective for ecological protection and ecological security pattern establishment [58–61]. In recent years, through large-scale greenway construction, the PRD combines ecological protection with

sports and leisure functions, which realizes the transformation from rigid ecological protection policies to livelihood projects about improving the quality of life [62].

3.3. Upgrading of Planning Technological Means

Before 2000, the technical means of planning mainly depended on planners' experience and satellite images. The practicability of land satellite image as a regional analysis tool is examined taking the PRD as an example. It is found that the false color composite images obtained by superimposing scenes of different spectral bands through a multi-spectral viewer provide an effective basis for interpretation. Therefore, both the structural features and land use characteristics can be mapped. The paper discussed the agricultural development in PRD, and put forward the problem of regional subdivisions. Thus, the satellite images and the comprehensive visual images provided by satellite images have important practical value for regional plannings [63].

At the end of the 20th century, scholars tried to demonstrate the function of land monitoring through the application of geographic information system (GIS) and remote sensing (RS) in urban growth management in PRD. It showed that GIS and RS were useful tools for formulating, implementing and monitoring urban development within the context of sustainable development strategy [15]. While more specific application cases were reflected in the urban level, some studies showed that there was a fast agricultural land loss in the rapid growing region as urbanization needs additional land, which mainly came from agricultural land. The land use problem is partly due to the lack of up-to-date information and appropriate land use planning. Based on this, some sustainable land allocation models are proposed with the integration of RS and GIS in Dongguan [64]. With the continuous improvement of technology, more accurate and practical methods have been provided for monitoring land use change and urban expansion in PRD [65]. The entropy method, for example, has the advantage of being simple and easy to integrate with GIS. Entropy space can be conveniently used to distinguish various kinds of urban growth patterns. The application of this method in PRD proves that it is very useful and effective for the monitoring of urban sprawl. It also provides a useful tool for quantitative measurement [66].

In the twenty-first century, RS and GIS are widely used in regional plannings in PRD. Through the analysis of land use change in 1988–1993 and 1993–1997, the paper illustrated how the enforcement of land use policy affected the direction and extent of landscape change. It also revealed how the adoption of market economy resulted in the internal structural adjustment of agricultural land from traditional paddy production to more diversified agricultural activities [67]. The new method provides a strong support for monitoring and planning urban growth boundary. For example, the use of urban cellular automata (CA) provides a new way to retrieve, evaluate and modify urban signatures. The method has been applied to the simulation of the compact development in PRD [68]. Liu et al [69] further improved this method and established a model based on the integration of artificial immune system (AIS) and CA to simulate the urban evolution. As planning objective was embedded into the AIS algorithm, the antibody will evolve gradually by changing the evolutionary variation mechanism. Then the spatial pattern of urban development based on different planning scenarios can be simulated to provide decision support for urban and land use plannings. In addition, with data from high-resolution TM remote sensing images and Google Earth map, using Envy and ArcGIS tools to identify and analyze the spatial pattern of the expanded metropolitan area in PRD, the highly specialized land use and seriously mixed land use patterns were identified [70]. Besides monitoring land use patterns, RS and GIS are also used in transportation networks, population movements, landscape changes and other aspects [71]. Spatial population dynamics affect resource allocation in urban plannings. The agent-based spatial population dynamic simulation model can provide useful information for urban plannings of rapidly developing manufacturing cities [72].

In recent years, with the advent of the Internet era, big data has become an important carrier of residents' geographical behavior. Resident migration, social networks, mobile communications and other geographic behavior data have become an important data source for urban studies. Urban and

regional plannings also have begun to use big data to achieve visual expression. The rapid, extensive and scattered urban expansion of PRD urban area has led to landscape fragmentation and inefficient use of construction land. The purpose of some studies was to develop a timely and efficient method to model the high-resolution economic benefits of construction land (EECL) by using the American Defense Meteorological Satellite Program (DMSP)/Operational Linescan System (OLS) nighttime light imagery and Landsat TM data. By comparing the temporal changes and revealing spatial-temporal dynamics, it provided a scientific reference for informed land-use planning and policy-making [73]. The applications of big data on population migration are much more common. There is a study that collected daily data on population migration between 369 cities in China in the first quarter of 2015, February 7 to May 16, from the Baidu Migration database. The result shows that the big data clearly show the pattern of population migration during the Spring Festival. The PRD is the main distribution center of human flow [74].

3.4. Promotion of Governance Measures

The urbanization from 1949 to 1978 was mainly driven by the internal power of the self-reliant central planned economy system. Some scholars pointed out that the Chinese government was the "police state" in the Foucauldian concept of governmentality. Its purpose was to control total administration of the economy and society [75]. After the reform and opening up in 1978, the dominance of state control and economic planning in China has rapidly declined [76]. There is a general trend in the evolution of the urban and regional planning system in China from a more centrally planned to a more market-oriented economy [77]. The decentralization of decision making, market-led urban development initiatives, the increase in the number of participants and conflicts of interest in land development have fundamentally challenged the practice of regional plannings. The shortage of traditional planning system has been recognized [78,79]. To cope with these shortcomings, the transformation of planning management and control is mainly reflected in three aspects: planning legislation, flexible governance and cooperative planning. The enactment of the 1989 City Planning Act was an important milestone in the attempt to reconstruct and formalize China's planning system to meet the challenges [77]. Although not indisputable [79], the decentralization of administrative power enables local authorities to pursue their own development. The government advocates the use of urban system planning to regulate development in urban areas. The urban system planning in PRD matches various measures and policies by formulating development strategies and hierarchizing the three metropolitan areas [75].

In the process of formulation and implementation of regional plannings in PRD, there are also some governance constraints [80]. First, it is the obscure relationship among the governments at different level and among different government departments. For example, Zou [80] pointed out several problems such as how to establish a rational relationship between urban conglomeration plan and other plans, how to integrate it into the practical planning system, what are the methods to implement it, etc. In this regard, the Implementation Ordinances of the Coordinated Development Plan of the Extended Metropolitan Region in the Pearl River Delta proposed on July 28, 2006, which clarified the responsibilities of governments and related departments at different levels in urban and rural spatial management [81]. In addition, the Implementation Ordinances of the Coordinated Development Plan of the Extended Metropolitan Region in the Pearl River Delta of Guangdong Province formulated the "The Guide of First-Level Spatial Governance Area". Taking the special planning of regional green space in Foshan City and the basic ecological control line in Shenzhen City as examples, the research put forward the idea of "coordinated planning". It actively cooperated with the relevant departments and governments at different levels during the planning and implementation process [82]. Second, there is inadequate public participation in the top-down plan making process. Public participation helps to ensure the legitimacy of urban planning in western planning systems; however, in a totally different context in China, the legitimacy of planning has been ensured by public ownership and state control, which results in large gaps between the resident's needs and government's support [77,83].

Third, community plays a weak role in urban and regional plannings, which is also quite different from western countries. The local community is the basic organization to organize residents to take adaptation measures. However, local communities are loose and inefficient at organization in the PRD area [83]. Thus, a collaborative workshop model composed by government, public, planners and social groups has been raised recently. Scholars believe collaborative workshop responds to local needs, encourages public participation in community planning, grooms community planners and promotes self-governance of communities [84]. Meanwhile, it has also achieved good results in practice, which provides a reference for the development of community planning in China [84]. This indicates that the regional planning of PRD has changed from rigid governance to flexible governance and coordinated planning (Figure 4).

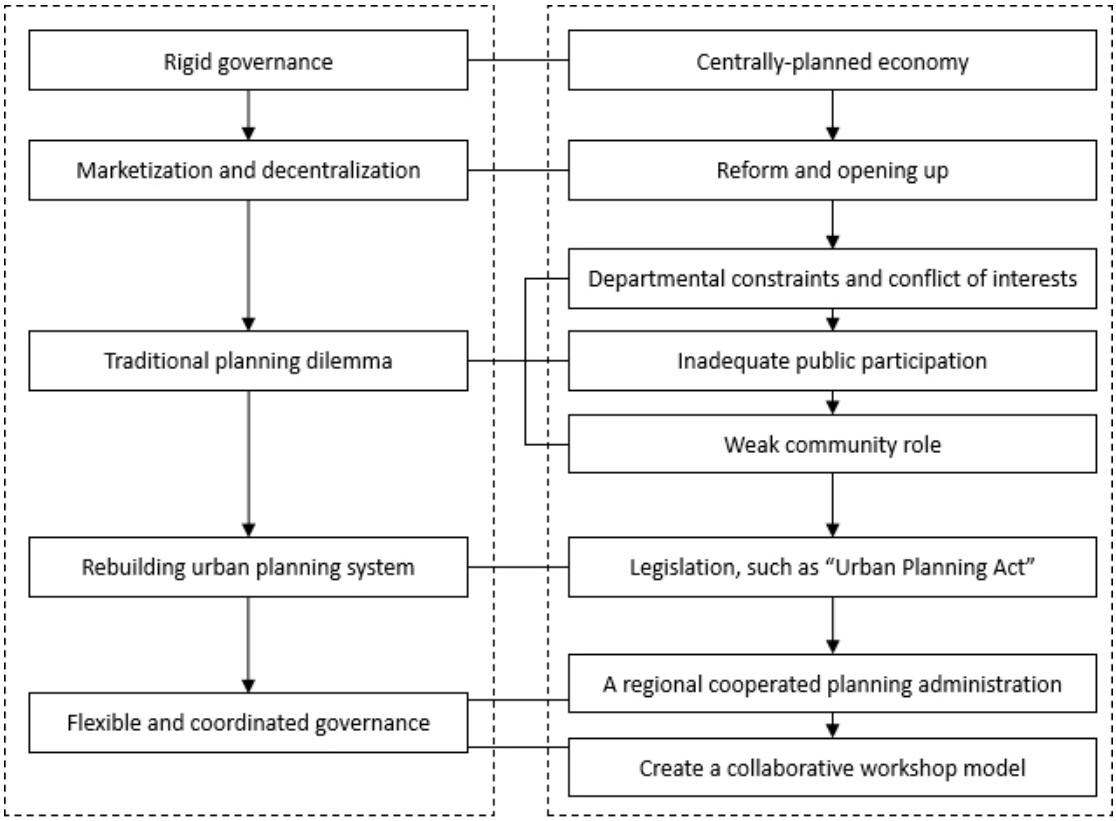

Figure 4. Evolution of flexible and coordinated planning governance in PRD.

After 2000, regional and cross-city planning cooperation has been strengthened increasingly (Figure 5). Since the signing of the Closer Economic Partnership Arrangement (CEPA), regional integration has become increasingly possible [85]. From the perspective of the New International Division of Labor (NIDL), scholars believed that the growing economic integration between Hong Kong and PRD had led to planning interaction, such as infrastructure development [86]. Through in-depth interviews with relevant actors and analysis of typical events in the case of infrastructure construction across administrative boundaries in PRD, it was found that the planning and construction of spatial cross-border infrastructure was becoming the most important means of governance in PRD [87]. Since China's reform and opening up, the PRD has been the center of rapid economic growth and structural reform. Hong Kong and Macao have played a key role in the economic and social transformation of the delta. However, the integration of PRD with Hong Kong and Macao was not guided by formal planning documents from 1978 to 2008. Through reviewing the process of planning cooperation between Guangdong, Hong Kong and Macao, it infers that the mode of cooperation has gradually shifted from "front shop-back factory" to institutional coordination. While, there are still problems such as single platform and channel for cross-border planning cooperation, relying on the overall

coordination of provincial governments and single means of cooperation. In response to the lack of an effective regional authority and the unique political framework of "one country, two systems", scholars believe that there is an urgent need for a regional level authority. It can be similar to the supranational institution of the European Union to promote and upgrade cross-boundary cooperation, which is also the application of multi-level governance (MLG) in China [88]. The specific strategies include establishing a multi-level and multi-agent planning cooperation framework, promoting the integration of urban planning of three metropolitan areas, jointly building an international quality living circle in Greater Bay Area, promoting co-construction, etc. [89–91]. Currently, the economic integration of Hong Kong, Macao and PRD is gradually institutionalized. With the "The Outline of the Plan for the Reform and Development of the Pearl River Delta (2008–2020)" and "Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area" issued, the PRD is entering a new stage of deepening reform and innovation. Further integration of PRD has become a matter of high priority, and it is suggested that the overall regional integration planning should be strengthened and sets up an effective mechanism in order to promote the construction of Guangdong–Hong Kong–Macao Greater Bay Area into a top level international bay area [92–94].

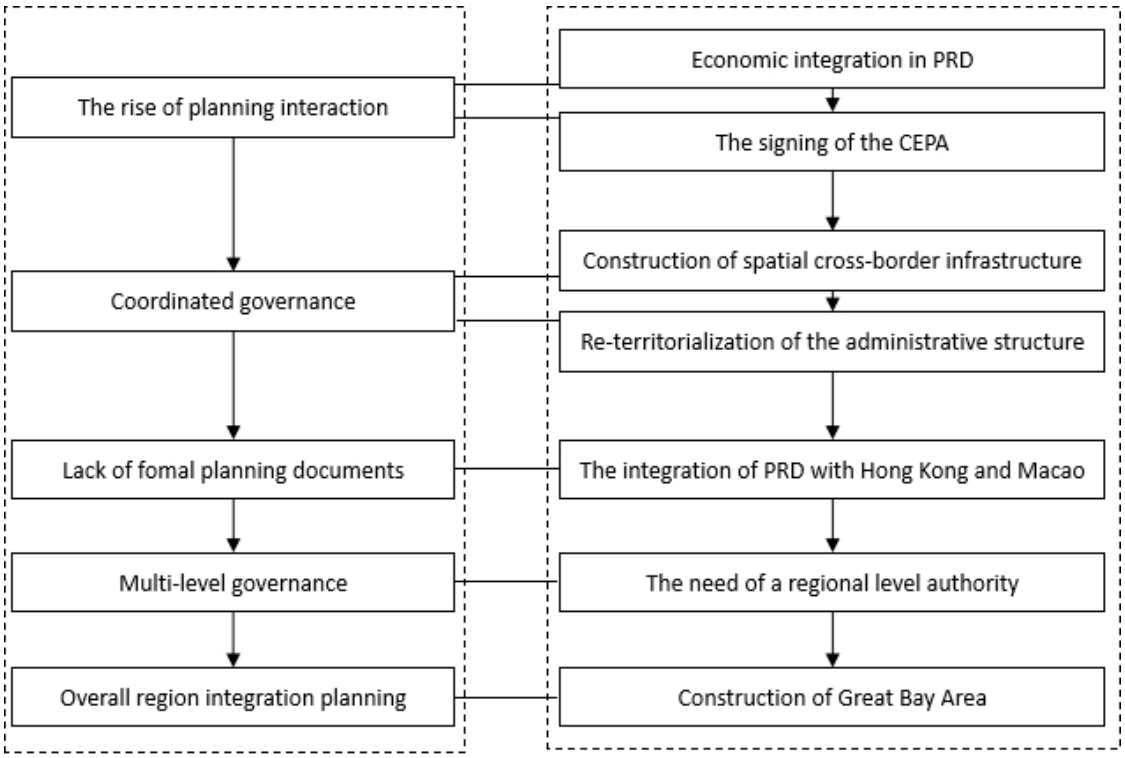

Figure 5. Evolution of multi-level planning governance in PRD.

Generally speaking, the governance measures in the regional planning of PRD are constantly adjusting and changing along with the change of national policy orientation, the game between government at different levels, the enhancement of public participation awareness and various problems in the implementation of the policy planning [95]. It shows the change from rigid governance under the overall control of the central government to multi-scale governance, regional coordination and flexible governance of all parties involved. It also reflects a change from regional integration concept to cross-border governance.

4. Conclusions and Discussion

Pearl River Delta, as a representative of rapid economic modernization and urbanization, has been the focus of academic study [96]. Under the background of globalization, marketization and

decentralization, how the planning theory and planning concept are applied in the PRD and how to adjust the planning for spatial management to adapt to the development were the research issues in this paper. This paper reviewed and combed the previous regional plannings and planning studies of PRD since the reform and opening up in 1978, and analyzed how to effectively guide and reshape the sustainable development space of PRD under the background of land and space disorder caused by the rapid development. The study finds that: (1) The transformation of planning concept: from incremental planning to stock/inventory planning, and constantly developing towards sustainable, ecological and coordinated planning concept to cope with fast-growing industries and deteriorating environments; (2) the transformation of planning content: the comprehensive and diversified development of planning content that from economic development-oriented production space construction to innovative high-tech production space, high quality living space, livable and friendly ecological space in response to the increasing production, living and ecological needs of the people; (3) planning technology means: from the concept of article expression, satellite image recognition to machine learning, multi-agent simulation prediction and big data visualization expression with the rapid development of technology; and (4) governance measures upgrading: from the rigid governance of the central government to flexible governance of multi-scale, regional coordination and participation of all parties to cope with the trend of regional integration and the improvement of civic quality.

Western planning theories have made considerable progress in understanding the limitations of fixed planning models and the necessity of establishing a fair participatory planning system [79]. Different from the urban planning of developed countries in Europe and America, China's development has its own unique characteristics [97]. Western theories are not completely applicable to China in many instances, but there are still many aspects worth learning, such as controlling urban sprawl, building urban ecological green space, strengthening public participation in planning, completing laws and regulations to ensure the implementation of planning, etc. From the comparison between China and western countries, the centralized institutional structure is one of the most obvious Chinese features that are characterized by strong leadership, which plays a significant role in mobilizing multi-level governments and agencies, integrating government resources and establishing a long-term institutional structure [56]. Surely, it is effective and efficient, and China is still heavily influenced by its traditional planned economy system, and various regulations associated with the system have not been totally abolished now [27]. However, we also can see some changes that the governance mode from a top-down administrative system to a more collaborative approach [56]. Meanwhile, as China's urbanization unfolds, planning practice has accumulated lessons learned and has gradually begun to form theories and best practice with an international influence [27].

During the forty years of drastic changes under the reform and opening up, the PRD region has not only realized its own rapid economic development, but also made many pioneering explorations and attempts for China's urban and regional plannings. Summarizing the experience in the regional plannings of PRD, this is mainly reflected in the flexible application of planning theory in combination with its own development advantages. In this "changing" situation of globalization, marketization and decentralization, it can grasp those "unchanged" elements and focus on development. Through the coordinated interaction between space and economy, it is pursuing the sustainable development. In the key period for China to start a new round of opening up, whether Guangdong–Hong Kong–Macau Greater Bay Area can further condense the consensus, taking full advantage of the "two systems" under the framework of "one country" is a valuable topic. Meanwhile, how to take the dual advantages of service industry in Hong Kong and Macao and manufacturing industry in PRD to meet the "the Belt and Road" initiative promoting the deep integration and re-emergence of the region will be worth further study.

Author Contributions: All authors have contributed to the development of the research and in the elaboration of this article. Specifically, conceptualization, Y.L. and Z.Z.; methodology, Z.Z.; validation, Y.L., Z.Z. and X.L.; resources, Z.Z.; writing—original draft preparation, Z.Z. and Y.L.; writing—review and editing, Y.L., Z.Z. and X.L.; visualization, Z.Z.; supervision, Y.L.; project administration, Y.L.; funding acquisition, Y.L.

Funding: This research was funded by the National Natural Science Foundation of China (Grant No. 41871114 and Grant No. 71961137003), the Guangdong Natural Science Foundation (Grant No. 2018A030313293) and the Science and Technology Program of Guangzhou, China (Grant No. 201804010192). And The APC was funded by the Science and Technology Program of Guangzhou, China (Grant No. 201804010192).

Acknowledgments: This research was supported by the National Natural Science Foundation of China (Grant No. 41871114 and Grant No. 71961137003), and the Guangdong Natural Science Foundation (Grant No. 2018A030313293), and Science and Technology Program of Guangzhou, China (Grant No. 201804010192).

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Du, Z.W.; Li, X. Growth or shrinkage: New phenomena of regional development in the rapidly-urbanising Pearl River Delta. *Acta Geogr. Sin.* **2017**, *72*, 1800–1811.
2. Xu, J. Governing city-regions in China: Theoretical issues and perspectives for regional strategic planning. *Town Plan. Rev.* **2008**, *79*, 157–185. [CrossRef]
3. Yang, J.; Zhu, S. Effect of industrial transfer policy on the evolution of regional product structure: Based on the "Double Transfer" policy in Guangdong Province. *Trop. Geogr.* **2017**, *37*, 452–461.
4. Chen, X.M.; Taylor, L.O. China's emerging Silicon Valley: How and why has Shenzhen become a global innovation centre. *Eur. Financ. Rev.* **2017**, *1*, 55–62.
5. Wei, Y.H.D. Regional inequality in China. *Prog. Hum. Geogr.* **1999**, *23*, 49–59. [CrossRef]
6. Jia, L. Analysis on turning to public policy of Pearl River Delta urban agglomeration planning. *Mod. Urb. Res.* **2016**, *1*, 78–82.
7. Yang, R. An analysis of rural settlement patterns and their effect mechanisms based on road traffic accessibility of Guangdong. *Acta Geogr. Sin.* **2017**, *72*, 1859–1871.
8. Zhang, X.L.; Lin, Y.L.; Wu, Y.Z.; Skitmore, M. Industrial land price between China's Pearl River Delta and Southeast Asian regions: Competition or Coopetition? *Land Policy* **2017**, *61*, 575–586. [CrossRef]
9. Chung, C.K.L.; Zhang, F.; Wu, F. Negotiating Green Space with Landed Interests: The Urban Political Ecology of Greenway in the Pearl River Delta, China. *Antipode* **2018**, *1*, 1–19. [CrossRef]
10. Chen, B. Rail transit development of the Pearl River Delta planning, obstacles and history. *Urb. Rail Transit* **2018**, *4*, 13–22. [CrossRef]
11. Lai, S.H.; Yan, Y.T.; Liu, G.N.; Pang, X.M.; Li, Y.Z. A review, evaluation and reflection of the Pearl River Delta regional plan. *Urb. Plan. Forum* **2015**, *4*, 12–19.
12. Fan, D.L.; Lu, X.B. Spatial evolution and planning response under "One Belt, One Road" impact. *Planners* **2016**, *32*, 17–22.
13. Xu, X.Q.; Li, X. Research on the urbanization of Pearl River Delta (1978–2008): Review and preview. *Hum. Geogr.* **2009**, *24*, 1–6.
14. Wu, F. *Planning for Growth*; Routledge: Abingdon, UK, 2015; pp. 25–118. (In Chinese)
15. Yeh, A.G.O.; Li, X. Urban growth management in the Pearl river delta: An integrated remote sensing and GIS approach. *ITC J.* **1996**, *1*, 77–85.
16. Su, J.; Wei, Q.; Guo, H. The mechanism and adjustment of urban sprawl of Guangzhou. *Acta Geogr. Sin.* **2005**, *60*, 626–636.
17. Roberts, P.; Chan, R.C.K. A tale of two regions: Strategic planning for sustainable development in East and West. *Int. Plan. Stud.* **1997**, *2*, 45–62. [CrossRef]
18. Peng, J.; Wang, Y.L.; Jing, J.; Song, Z.Q.; Han, D. Research on integrated regional planning of urban landscape functions: A case study in Shenzhen City. *Acta Ecol. Sin.* **2005**, *25*, 1714–1719.
19. Liu, Y.; Liang, Y.T.; Ma, S.P.; Huang, K.X. Divergent developmental trajectories and strategic coupling in the Pearl River Delta: Where is a sustainable way of regional economic growth? *Sustainability* **2017**, *9*, 1782. [CrossRef]
20. Zeng, C.; Zhang, A.L.; Liu, L.; Liu, Y. Administrative restructuring and land-use intensity—A spatial explicit perspective. *Land Policy* **2017**, *67*, 190–199. [CrossRef]
21. Du, J.F.; Thill, J.C.; Peiser, R.B. Land pricing and its impact on land use efficiency in post-land-reform China: A case study of Beijing. *Cities* **2016**, *50*, 68–74. [CrossRef]
22. Zou, B. Increment planning, inventory planning and policy planning. *City Plan. Rev.* **2013**, *2*, 35–37.

23. Zou, B. The transformation from greenfield-based planning to redevelopment planning: Theoretical analysis and practical strategies. *Urb. Plan. Forum* **2015**, *5*, 12–19.
24. Xu, J.; Yeh, A.G.O. City profile. *Cities* **2003**, *20*, 361–374. [CrossRef]
25. Shi, W.L.; Zou, B.; Jin, Z.M.; Shi, X.D.; Ding, C.R.; Wang, K.; Zhao, Y.J.; Zhen, H.; Lin, J.; Shi, N. Master plan targeted stock and decrement. *City Plan. Rev.* **2014**, *38*, 16–21.
26. Zhou, Y.; Long, Y. Urban development analysis and simulation to address inventory and increment planning: A case study of Chengdu. *Geogr. Geo-Inf. Sci.* **2016**, *32*, 45–51.
27. Gu, C.; Hu, L.; Guo, J.; Cook, I.G. China's urban planning in transition. Proceedings of the Institution of Civil Engineers. *Urb. Des. Plan.* **2014**, *167*, 221–236. [CrossRef]
28. Chao, H. Development model of city-industry integration in Pearl River Delta Desakota: Case of Foahan city. *Urb. Rural Dev.* **2018**, *12*, 51–54.
29. Sit, V.F.S.; Yang, C. Foreign-investment-induced Exo-urbanisation in the Pearl River Delta, China. *Urb. Stud.* **1997**, *34*, 647–677. [CrossRef]
30. Zhu, X.H. A study on spatial governance strategy of desakota area in Pearl River Delta region. *Urb. Plan. Forum* **2015**, *2*, 77–82.
31. Tan, Y.W.; Wang, L.; Xiong, L.F. Spatial planning and governance of Desakota Area in Pearl River Delta. *Planners* **2018**, *34*, 126–131.
32. Li, W.B.; Chen, H. Analysis of city-industry integration and planning strategies. *Urb. Plan. Forum* **2012**, *7*, 99–103.
33. Liu, Y.Y.; Han, W.C.; Yan, Y.T.; Li, Y.Z. Capital, power and production of space: The development paths and prospects of strategic areas in the Pearl River Delta. *Urb. Plan. Forum* **2016**, *5*, 46–53.
34. Lu, L.C. The regional development in the Pearl River Delta in new term. *Chin. Geogr. Sci.* **2002**, *12*, 309–314. [CrossRef]
35. Xu, X.Q.; Hu, H. The growth of city-towns in the Pearl River Delta by adopting the open-door policy. *Acta Geogr. Sin.* **1988**, *43*, 201–212.
36. Xu, X.Q.; Si, M.L. China's open door policy and urbanization in the Pearl River Delta region. *Int. J. Urb. Reg. Res.* **1990**, *14*, 49–69.
37. Xu, X.Q.; Huang, D.; Zhang, R. On features of town development in the Zhujiang River Delta since 1978. *Chin. Geogr. Sci.* **1992**, *2*, 114–125. [CrossRef]
38. Zhu, J.; Guo, Y. Fragmented peri-urbanisation led by autonomous village development under informal institution in high-density regions: The case of Nanhai, China. *Urb. Stud.* **2014**, *51*, 1120–1145. [CrossRef]
39. Zheng, S. Integrating rural-urban holistic human settlement system based on urban fringe village: The case study of Pearl River Delta. *Urb. Plan. Int.* **2014**, *4*, 60–64.
40. Po, L. Asymmetrical integration: Public finance deprivation in China's urbanized villages. *Environ. Plan. A* **2012**, *44*, 2834–2851. [CrossRef]
41. Herrle, P.; Ipsen, D.; Nebel, S.; Weichler, H. "Urban villages" and the development of the Pearl River Delta in Southern China. *Geogr. Rundsch.* **2008**, *60*, 38–46.
42. Lin, G.C.S. Evolving spatial form of urban-rural interaction in the Pearl River Delta, China. *Prof. Geogr.* **2001**, *53*, 56–70. [CrossRef]
43. Lin, G.C.S. Metropolitan development in a transitional socialist economy: Spatial restructuring in the Pearl River Delta, China. *Urb. Stud.* **2001**, *38*, 383–406. [CrossRef]
44. Song, H.; Pan, M.; Chen, Y. Nightlife and public spaces in urban villages: A case study of the Pearl River Delta in China. *Habitat Int.* **2016**, *57*, 187–204. [CrossRef]
45. Yang, L.; Yuan, Q.F.; Qiu, J.S.; Zheng, J.R. Measuring the success probability of redevelopment of urban villages: A case study of Pearl River Delta. *Urb. Constr.* **2012**, *11*, 25–31.
46. Hao, P.; Sliuzas, R.; Geertman, S. The development and redevelopment of urban villages in Shenzhen. *Habitat Int.* **2011**, *35*, 214–224. [CrossRef]
47. Curry, N.; Owen, S. Rural planning in England: A critique of current policy. *Town Plan. Rev.* **2009**, *80*, 575–596. [CrossRef]
48. Xiao, H.J. The study on rural transition and planning tactics in the Pearl Delta Area. *Mod. Urb. Res.* **2013**, *6*, 41–45.

49. Long, H.; Li, Y.; Liu, Y.; Woods, M.; Zou, J. Accelerated restructuring in rural China fueled by 'increasing vs. decreasing balance' land-use policy for dealing with hollowed villages. *Land Policy* **2012**, *29*, 11–22. [CrossRef]
50. Huang, H.; Zhang, Z.Y.; Li, F.H. Market intervention and coordination of TOD planning in Zhujiang Delta Region. *Planners* **2015**, *31*, 34–41.
51. Wen, Y.; Guo, P.C. Problems of the aquatic environment and countermeasures in the rapid economic development in the Zhujiang River Delta. *Chin. Geogr. Sci.* **1995**, *5*, 39–43. [CrossRef]
52. Lu, X.; Ma, Z.; Lin, Y. Coordinated planning framework for the transportation facilities and ecological environment in a rapidly urbanized area: A case study of the Pearl River Delta of China. International Conference on Infrastructure Systems & Services: Next Generation Infrastructure Systems for Eco-Cities. *IEEE* **2010**, *1–6*, 219.
53. Turner, T. *Landscape Planning and Environmental Impact Design*; UCL Press: London, UK; Bristol, PA, USA, 1998.
54. Little, C.E. *Greenways for America*; Johns Hopkins University Press: Baltimore, MD, USA, 1990.
55. Jongman, R.H.; Külvik, M.; Kristiansen, I. European ecological networks and greenways. *Landsc. Urb. Plan.* **2004**, *68*, 305–319. [CrossRef]
56. Liu, Z.; Lin, Y.; De Meulder, B.; Wang, S. Can greenways perform as a new planning strategy in the Pearl River Delta, China? *Landsc. Urb. Plan.* **2019**, *187*, 81–95. [CrossRef]
57. Gao, C.Z.; Wang, C.H.; Song, Y.T. Greenbelt construct and management of Pearl River Delta. *Planners* **2011**, *27*, 153–158.
58. Xia, Y.; Xia, B.; Li, H.; Chi, H.M. Greenway planning strategies based on ecological functional preservation principle: Pearl Delta Example. *Planners* **2011**, *9*, 39–43.
59. Zhuang, R. Pearl Delta Regional greenway planning based on ecological concept. *Planners* **2011**, *9*, 44–48.
60. Wu, J.Y.; Xiao, Y. An approach in greenway analysis and evaluation: A case study of Guangzhou Zengcheng Greenway. *Adv. Control Commun.* **2012**, *137*, 373–380.
61. Cai, Y.; He, F.; Li, Y.Y.; Kang, K.S. Greenway site choice with urban rural integration. *Planners* **2011**, *27*, 32–38.
62. Fang, Z.X. From ecological policies to livelihood projects: Research on construction model of greenways in the Pearl River Delta. *Mod. Urb. Res.* **2012**, *11*, 94–100.
63. Lo, C.P. LANDSAT images as a tool in regional analysis: The example of Chu Chiang (Pearl River) Delta in South China. *Geoforum* **1977**, *8*, 79–87. [CrossRef]
64. Li, X. A sustainable and allocation model with the integration of remote sensing and GIS - A case study in Dongguan. *Int. J. Environ. Stud.* **1997**, *53*, 325–348.
65. Li, X.; Yeh, A.G.O. Principal component analysis of stacked multi-temporal images for the monitoring of rapid urban expansion in the Pearl River Delta. *Int. J. Remote Sens.* **1998**, *19*, 1501–1518. [CrossRef]
66. Yeh, A.G.O.; Li, X. Measurement and monitoring of urban sprawl in a rapidly growing region using entropy. *Photogramm. Eng. Remote Sens.* **2001**, *67*, 83–90.
67. Li, X.; Yeh, A.G.O. Analyzing spatial restructuring of land use patterns in a fast growing region using remote sensing and GIS. *Landsc. Urb. Plan.* **2004**, *69*, 335–354. [CrossRef]
68. Li, X.; Yang, Q.; Liu, X. Discovering and evaluating urban signatures for simulating compact development using cellular automata. *Landsc. Urb. Plan.* **2008**, *86*, 177–186. [CrossRef]
69. Liu, X.P.; Li, X.; Zhang, X.H.; Chen, G.Q.; Li, S.Y.; Chen, Y.M. Embedding urban planning objective by integrated artificial immune system and cellular automata. *Acta Geogr. Sin.* **2008**, *63*, 882–894.
70. Dai, J.; Wang, K.; Gao, X. Spatial structure and land use control in Extended Metropolitan Region of Zhujiang River Delta, China. *Chin. Geogr. Sci.* **2010**, *20*, 298–308. [CrossRef]
71. Lu, X.; Liu, Q. Study on optimization of regional spatial structure based on land use and transport accessibility - A case study of Pearl River Delta region. *Appl. Mech. Mater.* **2012**, *137*, 435–439. [CrossRef]
72. Li, S.Y.; Li, X.; Liu, X.P.; Wu, Z.F.; Ai, B.; Wang, F. Simulation of spatial population dynamics based on labor economics and multi-agent systems: A case study on a rapidly developing manufacturing metropolis. *Int. J. Geogr. Inf. Sci.* **2013**, *27*, 2410–2435. [CrossRef]
73. Ye, Y.; Li, S.; Zhang, H.; Su, Y.; Wu, Q.; Wang, C. Spatial-temporal dynamics of the economic efficiency of construction land in the pearl river delta megalopolis from 1998 to 2012. *Sustainability* **2017**, *10*, 63. [CrossRef]
74. Liu, W.; Shi, E. Spatial pattern of population daily flow among cities based on ICT: A case study of "Baidu Migration". *Acta Geogr. Sin.* **2016**, *71*, 1667–1679.

75. Mee, K.N.; Tang, W.S. Urban system planning in China: A case study of the Pearl River Delta. *Urb. Geogr.* **1999**, *20*, 591–616.
76. Lin, G.C.S. The growth and structural change of Chinese cities: A contextual and geographic analysis. *Cities* **2002**, *19*, 299–316. [CrossRef]
77. Yeh, A.G.O.; Wu, F.L. The transformation of the urban planning system in China from a centrally-planned to transitional economy. *Prog. Plan.* **1999**, *51*, 167–252.
78. Ng, M.K.; Wu, F.L. *Challenges and Opportunities: Western Planning Theories and Changing Chinese Urban Planning Practices*; Science Press: Beijing, China, 1994; pp. 158–167.
79. Ng, M.K.; Wu, F.L. A critique of the 1989 City Planning Act of the People's Republic of China: A western perspective. *Third World Plan. Rev.* **1995**, *17*, 279–293. [CrossRef]
80. Zou, B. Dilemmas and development tendency in the implementation of urban conglomeration planning in China: Thoughts over the urban conglomeration planning of Pearl River Delta. *City Plan. Rev.* **2006**, *1*, 47–54.
81. Fang, Q.F.; Cai, Y.; Song, J.S.; Huang, Z.H.; Luo, X.H. Establishing an effectively coordinated regional urban-rural planning administration system. *City Plan. Rev.* **2007**, *12*, 9–14.
82. Huang, Z.; Song, J.S.; Yang, M.L.; Dong, N. Coordinated plan and coordinating plan: Planning and implementation of first-level spatial governance area in the Pearl River Delta. *City Plan. Rev.* **2007**, *12*, 15–19.
83. Liang, Y.T.; Jiang, C.; Ma, L.; Liu, L.; Chen, W.S.; Liu, L.L. Government support, social capital and adaptation to urban flooding by residents in the Pearl River Delta area, China. *Habitat Int.* **2017**, *59*, 21–31. [CrossRef]
84. Huang, Y.F.; Lang, W.; Chen, T.T.; Li, X. Collaborative workshop: Participatory community planning. *Planners* **2015**, *31*, 38–42.
85. Wu, F.L. Developing a competitive Pearl River Delta in South China under One Country-Two Systems. *China J.* **2007**, *57*, 160–162. [CrossRef]
86. Chan, R.C.K. Urban development strategy in an era of global competition: The case of south China. *Habitat Int.* **1996**, *20*, 509–523. [CrossRef]
87. Liu, C.Q.; Li, Z.G.; Xu, J.; Yeh, A.G.O. The restructuring of the city-regions in transitional Pearl River Delta: A case study of the construction of inter-jurisdictional infrastructures. *Urb. Plan. Int.* **2010**, *2*, 31–38.
88. Yang, C. Multilevel governance in the cross-boundary region of Hong Kong-Pearl River Delta, China. *Environ. Plan. A* **2005**, *37*, 2147–2168. [CrossRef]
89. Yao, J.C.; Chi, B.C.; Liu, Z.Y.; He, D.H.; Zeng, Z. Strategies of planning governance and collaboration of Guangdong-Hong Kong-Macau Greater Bay Area. *Planners* **2018**, *34*, 13–19.
90. Zou, B.; Shi, Y. The modulating mechanisms for regional coordination in China urban agglomeration region: Visions and proposals for the PRD region. *Urb. Plan. Forum* **2004**, *151*, 9–15.
91. Yang, B.J. Problems and solutions of regional coordination development. *City Plan. Rev.* **2004**, *10*, 26–34.
92. Li, J.P. Evolution and prospect of cooperative governance mechanism in the Guangdong-Hong Kong-Macao Greater Bay Area. *Planners* **2017**, *33*, 53–59.
93. Yeung, Y.M. The further integration of the Pearl River Delta: A new beginning of reform. *Environ. Urb. ASIA* **2010**, *1*, 13–26. [CrossRef]
94. Ye, L. Urban transformation and institutional policies: Case study of mega-region development in China's Pearl River Delta. *J. Urb. Plan. Dev.* **2013**, *139*, 292–300. [CrossRef]
95. Yang, C.; Li, S.M. Transformation of cross-boundary governance in the Greater Pearl River Delta, China: Contested geopolitics and emerging conflicts. *Habitat Int.* **2013**, *40*, 25–34. [CrossRef]
96. Schoon, S. Chinese strategies of experimental governance. The underlying forces influencing urban restructuring in the Pearl River Delta. *Cities* **2014**, *41*, 194–199. [CrossRef]
97. Shen, Y.F. The main schools and trend of research on regional planning in the contemporary western world and rethinking of the new generation of regional planning in China. *World Reg. Stud.* **2006**, *15*, 22–28.