Urban ecological conservation policy in Shenzhen: the production of a ‘Biophysical Fix’

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ABSTRACT
Local environmental policy has recently become the topic of academic research and practices within the context of increased integration of the ecological dimension in the existing regulation of economies and societies, and space. Based on these discussions, local environmental policy is not merely an issue of ecological technology; rather, it is more a question of social power, in particular the power of the state and its ability to balance other forces and demands placed on it by society. The paper draws on this theoretical discussion to capture the multidimensionality of the power relations involved in the approaches to local ecological policy. The evolution of the policy agenda in the city of Shenzhen provides a paradigmatic example of the way in which policies can be shaped by the political considerations that surround and act between nature, governmental departments and society. The empirical results show that the ecological conservation policy of the city has shifted away from comparatively weak ecological regulations towards a stronger set of principles. The comparatively stronger ecological regulatory regime is best understood as a ‘biophysical fix’ that has been shaped by various forces originating in broader economic, social and institutional struggles.

Introduction
Ecological conservation has been practiced worldwide within the current era of eco-state restructuring (While, Jonas, & Gibbs, 2010) in various forms (see Sandwith et al., 2014). The implementation of various conservation agendas at the local scale, particularly the designation of nature reserves in local areas, has affected local politics, partly because of the localised indicators of the designation of nature reserves and partly because the implementation of the relevant policies requires the cooperation of local interest groups, among which a contentious process of brokering and negotiation may develop. As a response to the necessity of conducting research on the politics of ecological conservation at local scales, the concept of ‘urban sustainability fixes’ (While et al., 2010, p. 551) is taken as an analytical framework to investigate the ways in which policy agendas are implemented locally by
capturing the dilemmas, compromises, and opportunities created by the parallel process of top-down policy discourse and bottom-up local governance.

This article relocates ecological conservation policy within the context of socioeconomic and political transition in China and explores the changing approaches to the protection of ecologically sensitive areas in Shenzhen. As the first Special Economic Zone located in the Pearl River Delta (PRD) Region, Shenzhen is held up as a prime example of rapid economic growth and urbanization in China under the Reform and Openness programs that have operated from 1978 onwards. Shenzhen's local political economy after 1978 was originally highly focused on securing growth and investment. However, after the city expanded rapidly from 1979 to 1993 on the basis of resource-based growth promotion in a transitional political economy, the city leaders have subsequently (from 1994 onward) sought to reposition and reorient the city for a new phase of growth based around industrial upgrades, transitions in economic growth, reshaping of the urban culture and the enhancement of the quality of the urban environment. A number of influential planning strategies have accompanied this social transition intending to protect its essential surrounding ecological environment (Ng, 2002a, 2002b). The new character of Shenzhen's city politics closely reflects the glocalisation and entrepreneurial nature of city governance, and what some researchers have noted a new global-local environmental politics constructed around ecological modernisation and the partial greening of capital (Gibbs, Jonas, & While, 2002; Hajer, 1995). The city of Shenzhen's politics and practice of planning and designating ecological conservation reserves also mirror those of other places in urban China searching for an 'urban sustainability fix' (Pow & Neo, 2013).

This paper aims to characterise the evolving paradigm of ecological conservation policy in the city of Shenzhen, as well as what it reflects about the urban politics of ecological conservation policy-making in China. The paper argues that the evolving approaches to ecological conservation reflect, as discussed in strands of the literature in ecology, political ecology and human geography (Gibbs, While, & Jonas, 2007; Scoones, 1999; Swyngedouw, 2004; Zimmerer, 2000), are not merely a transition in ecological conservation technology, but more a question of producing a 'biophysical fix', which reflects the state's capabilities in balancing other forces and demands from the society (Jessop, 1996, 2002) (see Figure 1).

The paper is organised as follows. It begins with a literature review of the urban politics of ecological conservation policy-making. The framework of 'biophysical fix' drawn from the literature has been applied to a single case study of the city of Shenzhen. The case study starts with a general review of the socioeconomic development of the city, considered together with its institutional structure of local governance. Further, the paper provides an analysis of the evolving approaches to ecological conservation during the two different phases of the city's development, as well as how they were shaped by the pressures and demands of ecological conservation. The paper concludes by reflecting on the implications of the city's policies and their future development.

**The urban politics of ecological conservation policy-making**

The contemporary world is experiencing the process of eco-state restructuring (While et al., 2010), in which 'the reorganisation of state powers, capacities, regulations and territorial structures around institutional pathways and strategic projects, which are (at least from the vantage of state interests at a given moment in time) viewed as less environmentally
Conservation of specific ecological areas is among the most widely implemented practices in the current era of eco-state restructuring. The term ‘ecological conservation’ refers to the set of interventions that seek to preserve, conserve or restore species, habitats and ecosystems of nature and ecology, in other words, ‘the ideologies and practices of preservation, protection and enhancement of nature’ (Adams, 1997, p. 278). Ecological conservation is inevitably a spatial activity and has come to be based around the designation of protected areas.

The area of ecological reserves has increased rapidly worldwide over the past 25 years in the forms of UNESCO MAB reserves, heritage sites, Ramsar reserves, strict nature reserves, wilderness areas, national parks, national monuments or features, habitat/species management areas, protected areas with sustainable uses, protected landscapes/seascapes, community resource management and co-management zones, etc. (Sandwith et al., 2014). The implementation of these conservation agendas is unlikely to be a simple ‘cascade’ of international and national targets to existing government units (While et al., 2010); instead, they must be traded off with the politics of local development.

The key to understanding policy-making in ecological conservation at the local scale lies in an exploration of the relationships between ecology and urban politics. For a long period of time, space has been regarded by scholars working in the area of urban development politics as an important container where growth is to be achieved. Molotch (1976) notes that the very essence of a locality is its operation as a growth machine, where the desire for growth provides the key operative motivation toward consensus for private and public stakeholders in relation to land development. Only growth, which includes an initial expansion of basic industries, a rising scale of retail and wholesale commerce, intensive
land development, higher population density, and increased levels of financial activity, can increase the exchange value of land, which contributes to the motive of speculative capital accumulation (Molotch, 1976). Harvey (1989) goes further and proposes the argument that the city could play a role as an active agent to pursue entrepreneurial advantages as an enterprise, rather than merely being a container where entrepreneurial activities occur. Cities with entrepreneurialism could be defined as strategic actors, who, through competitive strategies, proactive approaches and innovative images, build geographically based strategies to enhance the cities’ ‘structural competitiveness’ to fix the eternally migrating capital (Jessop & Sum, 2000). The innovative reconstruction of urban form, function, and space is one of the core strategies for achieving the goal of an entrepreneurial city. When limited space carries the interests of different interest groups, while space also acts as a body that participates in the competition, the separation of certain spaces within cities for conservation has been regarded by some as creating hard edges for growth (Gibbs et al., 2007). This has been reflected in a series of practices, which take the form of, for example, urban growth management boundaries and negotiations among developers and conservation groups over the boundaries of conservation territories (Gibbs et al., 2007).

However, an increasing number of recent studies have noted that ecological conservation might have links with urban development politics. The concept of the urban sustainability fix has elaborated on this new characteristic of urban development politics. Drawing on Harvey’s concept of ‘spatial fixes’, While Jonas and Gibbs, using their concept of ‘urban sustainability fixes’ (While, Jonas, & Gibbs, 2004, p. 551), attempt to theorize the process of local environmental policy-making. They argue that urban sustainability fixes result from a balance among various pressures and demands. On the demand side, local government has economic imperatives to create urban green space in order to win the intensified intercity competition, which is based on high-level human resources and high efficiency in resource utilization. Local governments also face ‘regulatory drivers’ imposed from above, in particular international and national environmental regulations that require implementation at the local scale. In addition to the abovementioned pressures towards environmental regulation, demands for environmental policy from pressure groups have to take into account local decision-making. However, these demands are only part of the picture. Municipalities must respond to pressures for ecological conservation, such as increasing pressure from ecological conservation legislation, as well as conservation agendas or targets set at higher levels of institutional or organizational involvement (Gibbs et al., 2002) that construct the discourse for local environmental practices. In the meantime, neo-liberal approaches to ecological conservation have become new opportunities for cities and regions to engage in ecological conservation markets to offset higher financial returns on conservation input (Castree, 2008a; Robertson, 2004, 2006; While et al., 2010). Municipalities must respond to pressures for ecological conservation, such as increasing pressure from ecological conservation legislation, as well as conservation agendas or targets set at higher levels of institutional or organizational involvement (Gibbs et al., 2002) that construct the discourse for local environmental practices. In this sense, entrepreneurial city leaders are embarking on a series of environmental policy initiatives in a positive manner within their jurisdictions, developing partnerships with non-governmental actors, and limiting damaging behaviour that affects the environment, and therefore shaping a series of urban sustainability fixes.

Ecological conservation could be argued to be one form of ‘sustainability fixes’. As essential constituents of urban spaces, ecological areas have a variety of economic, social and
ecological values in supporting the human use of non-human nature. A range of social practices thus seeks to preserve, conserve, or restore these ecological resources, demonstrating a shift away from the initial protection of areas as wilderness areas (Adams, 1997; Jepson & Whittaker, 2002; Kalamandeen & Gillson, 2007) to habitat management to protect particular species (Adams, 1997; Cox & Moore, 2010; MacArthur & Wilson, 2001; McIntosh, 1986) and, more recently, an increasing emphasis on ecosystem management (Margules & Pressey, 2000; Yaffee, 1999; Zimmerer, 2000). The policy-making activity associated with ecological conservation provides a focus for negotiation or conflict (While et al., 2010) in which a mix of state and non-state actors, situated at different geographical scales of decision-making, are usually involved (Cox & Moore, 2010; While et al., 2004, 2010). Their competing claims over the use of ecological reserves shape a set of forces, pressures, demands, and opportunities for national and sub-national governments. Additional pressure for conservation comes from conservation pressure groups, which involve actors such as ENGOs (environmental nongovernmental organizations), environmental social movements, and scientists (Castree, 2007; Polanyi, 2001). Some capitalist companies whose commercial interests are based around the conservation of ecological reserves may also be part of or provide support to conservation pressure groups. Various levels of government have an interest in investing in conservation infrastructures (Castree, 2008a), including the preservation, conservation or restoration of ecological landscapes or places. This includes the need to invest in ecological infrastructure in order to maintain and create the necessary conditions for growth and to win inter-place competitions in terms of attracting investment or workers in the future (While et al., 2004, 2010). However, governmental decision makers may have to face pressures against ecological conservation from pro-growth interest groups. These groups may involve governmental or non-governmental groups whose interests primarily involve developmental activities (Castree, 2008b), which may exert an influence on ecological spaces. In the meantime, neo-liberal approaches to ecological conservation have become new opportunities for cities and regions to engage in ecological conservation markets to offset higher financial returns on conservation input (Castree, 2008a; Robertson, 2004, 2006; While et al., 2010).

In this paper, the term ‘biophysical fixes’ (Castree, 2008a, p. 146) here refers to decisions made to choose certain strategies or policies for the conservation of ecological reserves, which reflect the ‘strategic selectivity of the state’ in that ‘governments seek to balance environmental and ecological goals with other forces, pressures and demands within the wider society’ (Jessop, 2002, p. 31). This term could be considered as representing a subset of ‘sustainability fixes’, given that the former places emphasis on the conservation of nature, rather than the much wider context that the latter may cover. This framework also implies a need to identify the normative dimensions of the uses of various policies as being either weak or strong, in order to understand their likely efficacy in ensuring positive outcomes in terms of ecological protection, given the trade-offs involved between economic, social and ecological considerations.

**Methods**

This research was based on a single case study of the city of Shenzhen. The study draws upon a continued monitoring program (from 2008) of Shenzhen’s planning activities. This monitoring program involves continuous and interactive processes, and reflects the model of ‘data collection, followed by analysis and memo writing, leading to questions, that lead
Multiple sources of evidence, including policy documentation, non-participant observation, media reports and interviews, were collected and triangulated (Yin, 2009) to ensure their validity and reliability (Silverman, 2005). Three types of interviews were employed in this research: open-ended interviews; semi-structured interviews, and focus groups. Twenty semi-structured interviews were conducted with key actors in Shenzhen’s policy-making communities, including government officials, residents, community activists, and business operators. Three focus groups interviews were conducted to explore some consistent and shared views (Patton, 1990). One was conducted with five local planners and focused on the recent plans of the case study area. Another was conducted with two community leaders on the eastern peninsula of Shenzhen. The third was conducted with local residents. The interviewees were selected according to the analytical framework and included a wide range of participants in the local state regulatory agencies, national and local planners, ENGOs, national and local experts, local residents, etc. These interviews were audio-taped; notes were taken when no audio-tape was required by the participants. All the interviews were transcribed, and key quotations were translated into English, at the write-up stage. This information was supplemented by thorough inspection of key policy documents, other ancillary texts, newspaper accounts, and websites. The documentary analysis is based on documents recording 30 years of development of Shenzhen since 1979; strategic plans of Shenzhen during the past 30 years and the strategic plans of this city for the following 20 years, including its economic development strategy and social development strategy, etc.; and official (e.g. governmental policies, etc.) and non-official documents (e.g. newspapers, memoirs, etc.) that describe the evolving process of ecological conservation in the city.

Data analysis is a continuous process, which starts during data collection and consistently shapes the ongoing data collection (Pope, Ziebland, & Mays, 2000). It was conducted by combining both manual and electronic tools Nvivo 8 (QSR International Pty Ltd., 2010). Three ongoing and cyclical steps are involved and interwoven in data analysis: familiarising, organising and coding data; generating categories and sub-categories; and modelling relations (Corbin & Strauss, 2008). In this sense, a framework was further developed based on both the initial framework formulated according to theory and data collected from the field. The model explorer tool in Nvivo is useful at this point for mapping out diagrammatically related themes and how they relate to each other.

**China’s eco-state restructuring**

The Chinese state has experienced eco-state restructuring since 1992. In 1992, the state announced its Ten Strategic Policies for sustainable development (Zhang & Wen, 2008). The 9th Five-Year Plan (FYP) proposed ‘sustainable society’ as a key ideology which was carried through in subsequent FYPs. This ideology was intended to guide the transition of China into a sustainable society, with a resource-efficient industrial economy and eco-friendly urbanization process (Yuan, Kang, Yu, & Hu, 2011). Until 2000, according to China’s Millennium Development Goals Report (2010), the government had carried out many environmental and ecological projects, such as returning farmland to forests and grasslands, improving the quality of lakes and wetlands, protecting water and top soil, protecting forests, limiting water and air pollution, protecting wildlife, creating nature reserves, promoting energy efficiency, and developing renewable resources. From 2002 onwards, China’s policies
have prioritized sustainable development. The key concerns were saving energy and reducing emissions, as well as ecological conservation and integrated ecosystem management. The key tools of this management process were market-oriented, technological, fiscal, and social instruments. The main characteristics were integrated and comprehensive management, cleaner production and life cycle control (He, Lu, Mol, & Beckers, 2012). The 11th FYP introduced the concept of the ‘circular economy’, an industrial ecology paradigm that involves a closed-loop circulation of energy, materials and waste, and the ‘three Rs’ that promote a transition in the national mode of economic growth (Mathews & Tan, 2011). The 12th FYP states that China is trying to shift to a new development model and a new green governance approach, which focuses on the decentralisation of regulation to share power with society (He et al., 2012). Since 2007, the national fiscal expenditure on environmental protection has increased significantly, from 99.582 billion Yuan in 2007 to 3815.64 billion Yuan in 2014. Even though the total fiscal expenditure in 2014 was only 3.05 times that of 2007, the expenditures for environmental protection as a proportion of the total national financial expenditure increased from 2% in 2007 to 2.51% in 2014, and even reached 2.72% in 2010 (Xiong, Chen, Liu, & Xu, 2016).

Ecological conservation became a key concern of the state policy against the background of eco-state restructuring. In 1991, the Chinese central government enacted statutory procedures to encourage the establishment of conservation areas at the county, provincial and national levels (Jim & Xu, 2004), implying an attempt by the state to re-regularise and strengthen government functions and thus to improve the efficiency of the management of protected areas. The national conservation planning framework identifies the pivotal role of government at different scales and the need to cooperate across scales for conservation, with an eye toward the maintenance of biodiversity and the restoration of certain rare, threatened, or typical natural habitats and species to favourable conservation status (China State Council Committee for Protection, 1997). From 2005 onwards, an emphasis on ecological function conservation areas, underpinned by the concept of ecosystem management, demonstrates an increased intention to carry out ecological governance, in which urban authorities are required to work together with different ministries or administrations at various levels to jointly manage the environment and ecology (Liu, Zhang, & Bi, 2012). The decentralisation of the responsibility of ecological conservation in China to the city and regional scale is unlikely to be a simple ‘cascade’ of international and national targets to existing government units (While et al., 2010); instead, they must be traded off with the politics of urban development.

The city of Shenzhen and its institutional structure of governance

Shenzhen is a city that borders Hong Kong and is located in the southern part of Guangdong Province, China. It is one of nine Special Economic Zones in the PRD, which has been one of the main areas for economic development in the post-1979 era and is not only a manufacturing centre but also an innovation centre of China. In May 1980, Shenzhen was formally designated a ‘Special Economic Zone’ (SSEZ). Since its inception in 1979, the city has grown at an amazing speed from a tiny rural town to a large city in China. A high diversity of plants and animals exists within the city’s total area of 1991.64 km². The dominant vegetation types are tropical evergreen monsoon forests and subtropical seasonal evergreen broad-leaved forests, including families such as Lauraceae, Theaceae, Euphorbiaceae,
Papilionaceae, Fagaceae, Moraceae, Rubiaceae and Asteraceae. Approximately 20 nationally rare and endangered plants found here are listed on the China Species Red List (e.g. Alsophila spinulosa, Cycas fairy-lakea, Camellia granthamiana, Archiboehmeria atrata and Nauclea officinalis). 530 terrestrial wildlife species have their habitats in the city, including 389 bird species, 31 amphibian species, 73 reptile species and 37 mammalian species. Of these, 5 species are listed in the first class of nationally protected animals (i.e. Python molurus, Trago panchaboti, Neofelis nebulosa, Quasipaa spinosa and Platysternon megacephalum) and 43 species are listed in the second class (e.g. Lutra, Accipiter solensis, Falco tinnunculus, Malayan pangolin and Macaca mulatta) (Xun, Yu, & Wang, 2017).

A triple process of globalisation, decentralisation and marketisation has made the Shenzhen local government autonomous in its decision-making (Zhu, 2004). The power centre of the city of Shenzhen remains mainly within the local government, which is in its early stages of development, in common with other cities in China. The decision-making authorities are composed of five sets of organizational bodies: the Municipal Party Committee, the Shenzhen Municipality Government, the Municipal People's Congress, the Municipal People's Political Consultative Conference, and the Municipal Party Disciplinary Inspection Committee. Other local governmental departments ‘affect decision-making through supervision, such as the SBEP’ (Shenzhen Municipality Government official no. 4 2009). Of these, the Municipal Party Committee and the City Council constitute the power centre of decision-making.

Since the late 1990s, however, Shenzhen has attempted to transfer decision-making power from the enclosed governmental regulatory bodies to the wider society, though with appropriate limitations (Shenzhen Municipality Government official no. 3 2012). One of the reforms involved the establishment of the Urban Planning Board of Shenzhen (UPBSZ). Composed of official and unofficial members (including experts and social actors), UPBSZ is a permanent decision-making institute, which has the right of censorship on planning-related issues and the various levels of plans. Within the committee, there are several specific committees that specialise in development strategy, statutory graphic standards, construction and the environment, etc. (UPBSZ, 2002). The decision-making processes of these specific committees are hosted by the committee members, and relevant experts participate. Any decisions made by the specific committees will be submitted to the UPBSZ for final censoring and approval. Theoretically, the establishment of the UPBSZ was intended to partially shift the power away from the Shenzhen Municipality Government to the public through the empowerment of the Municipal People's Congress (Lei, 2003). Members of the public have the opportunity to be involved in the decision-making process by being elected as one of the 29 committee members. Through the mechanism of majority approval, it is expected that the leader-led decision-making process could move towards group-based decision-making (UPBSZ, 2002).

This institutional framework has entailed the involvement of experts in the decision-making process in Shenzhen, even though it is more an issue of selective empowerment. Various experts are involved in the decision-making process in that they are consulted during the process of formulating, censoring and approving plans and policies, and they also help supervise the implementation of decisions. ‘Through the communication with these international and national experts’, they ‘actually broaden and deepen’ their ‘understanding of many issues’ (Shenzhen Municipality Government official no. 1 2009). Their involvement invariably brings in new ideas and values and therefore essentially redefines and reconstructs
the value positions of the decision makers. This influences policy choices and priorities that are designed to meet selected goals, for instance enhancing competency in attracting additional investment.

In comparison with the official integration of experts in policy-making, bottom-up voices have been heard and have affected the decision-making process and policy agendas, mainly through the media. The media is a crucial platform to help produce a strong interaction among the values of various social actors, who subsequently exert strong pressure on the decision makers and thus influence the policy priorities underlying the decision-making. This is especially the case for newspapers and internet forums. Newspapers in Shenzhen are actively engaged in key environmental debates at both local and national scales. The relevant concerns include the Nan Fang (Southern) Daily Media Group (including Nan Fang Weekend, Nan Fang Daily, Nandu Daily, etc.), the Shenzhen Daily Media Group (including Special Zone Daily, Shenzhen Economic Daily, Dailyss, etc.), and internet review groups, such as interhoo (www.interhoo.com). Due to the increasing power of the internet, in Shenzhen, internet participation in terms of submitting political motions has been practiced during the People's Republic of Congress.

An emerging ENGO sector is activating in the policy-making of the city. According to Dong (2010), the local ENGOs make up 0.9% of the total number of NGOs (i.e. 3572) that are registered in Shenzhen. Some of the most influential ENGOs in Shenzhen include both national ENGOs, including Green River and Friends of Nature and locally based ENGOs, including student environmental associations (e.g. Shenzhen University’s environmental associations) and some social organizations (e.g. the Shenzhen Bird Watching Society, Shenzhen Mountaineering Association, the Green Club in Baqian Shenzhen, the Outdoor Sports Association, the Shenzhen Environmental Protection Centre, the Blue Marine Protection Association, the environmental protection group of the Social Volunteers Association in Shenzhen, and the Green Hope Environmental Protection Association in Luohu District, Shenzhen). The development of ENGOs in Shenzhen is subject to government intervention since its inception. ‘It could play a supervisory role … yet, in fact, the administrative power is very strong … it can only be a supplement … it is still hard to break into the mainstream’ (Local environmental activist no. 2 2009).

Economic actors exert pressure on decision makers in at least three ways: they exert pressure on the formulation of relevant plans, laws and regulations; they exert pressure on the examination and approval of certain plans and policies, and they exert pressure on land use management policies. The intention of the developers has influenced the formulation of relevant plans through land leasing and auctions (Local entrepreneur no. 3, 2013).

The following section examines the approaches to ecological conservation policy in order to capture the dilemmas, compromises, and opportunities created by the parallel process of top-down policy discourse and bottom-up local governance dilemmas.

**The production of a ‘biophysical fix’ in the city of Shenzhen**

As argued by some (Lan, 2009; Shen, 2008), Shenzhen, in its early years, typified the Chinese entrepreneurial city management model to a large extent (Li, Miao, & Lang, 2011). The city was locked into a growth paradigm in terms of attracting inward investment, increasing local financial revenues and promoting the city’s competitiveness (Ng & Tang, 2004). Due to its geographical proximity to Hong Kong, Shenzhen was defined as the first test field for the
Chinese central state (SDPB, 2002). This intention of the central state constituted a strategic context for the policy-making of the city government. Promoting urban economic growth through taking over parts of modular production in world manufacturing thus became the main aim that local decision makers were trying to achieve (Shenzhen Municipality Government official no. 2 2014). Policies were formulated to support the development of comprehensive industries that covered the secondary sector of the economy, trading and commerce, agriculture, stock raising, the building of housing and urban tourism (SDPB, 2002), which led to the process of urbanization being dependent on a steady supply of natural resources, including fresh water, fuel, land, food and all raw materials. The urban expansion was further strengthened by the land market that was introduced in the city in 1987 as a way of increasing the government’s revenue (Ng, 2003). In this context, the economy of Shenzhen maintained a double-digit growth rate each year for two decades since 1980 (Deng, 2008) and the value-added of the secondary sector of the economy increased 86.9% per year during this period; the construction industry and the processing and assembly of industrial products were the leading industries (Deng, 2008).

Such a mode of economic growth, plus the pressure for rapid urbanization imposed by fierce inter-city competition (Wu & Zhang, 2007) placed strains on the environment and ecology, with these issues taking a lower priority in the bid to attract investment and sustain growth in decision-making in urban management. Limited endeavours had been made by the Shenzhen Municipality to preserve wildlife by the designation of parks. Since 1985, nature reserves, such as the Futian Mangrove Nature Reserve, the Lingding Island natural, protected areas for ecological communities, and the Nantou Litchi forests were constructed. The concept of ‘ecological zones’ (Shenzhen Master Plan Formulation Committee, 1996) was proposed in 1996, which could be regarded as part of a wider policy whereby the whole city was expected to be divided into five ecological zones, specifically urban construction ecological zones, agriculture conservation ecological zones, water source ecological zones, tourism resorts ecological zones, natural plant ecological zones & urban green land ecological zones (Shenzhen Master Plan Formulation Committee, 1996). In 1998, the municipality established the objective of constructing an ‘International Garden City’. Within 4 years, the city had built the Huanggang Park, Dameisha Beach Park, the Central Park, a mangrove seashore ecological park, and proceeded to build Meilin Park and Dasha River Park, as well as Ma Luan Shan, Tang Lang Shan, Qiniang Mountain and several other urban country parks. Since 2003, the designation of parks in the city has continued to expand into communities.

Even though Shenzhen Municipality has increased its efforts in ecological conservation from 1994 onwards, the influence of the growth-oriented urban political economy remained during the 1990s. Rapid urban expansion was not effectively contained, in particularly at the edges of the city. Severe environmental problems, particularly the pollution of water sources, the degradation of the bay ecology, air pollution, soil and water loss and solid waste, as well as severe noise pollution, have been noted (Ho & Leung, 2014; Shenzhen Reform & Plan Bureau, 2000).

**Pressures for ecological conservation from the civil society**

Given that ecological values had been prioritized in the international, national and local development agendas, the increased anxiety and worry about local environment degradation on the part of society led the Shenzhen Municipality Government to seek for a more
effective way to carry out ecological regulation. In June 2000, Liu Meng Hu and 51 other representatives proposed and submitted ‘a motion with regard to further controlling river pollution in the city’ in the fourth conference of the presidium in the first session of the third Shenzhen People’s Congress, which was passed as the only proposal (Shenzhen Municipality Government, 2006). In 2000, more media coverage regarding river pollution was generated. In 2002, geological experts, for instance Xia (2002) and Li, Feng, Lin, Xia, and Liang (2002) reported the impacts of local economic development on the marine geological environment in Daya Bay in a number of studies and called for the government and the society to attach greater importance to environmental protection against the backdrop of rapid economic growth. In the following year, the media continued to publish a series of reports on river pollution with the title of, ‘Why is it that sewage was pumped anywhere else rather than into the treatment plant?’ (Feng, Xiao, Gong, Wang, & Li, 2003). These reports aroused widespread concerns in society regarding the environmental crisis. The pollution of water sources in the eastern part of the city was interpreted by the media as the direct outcome of the inappropriate operation of several dyeing and printing factories. Some events were continually under the media spotlights, such as the poaching of coral (Lin & Li, 2003). In 2001, botanists noted that there were at least 20 categories of precious plant resources in Qiniang Mountain; however, the habitat of these plants was destroyed by large-scale deforestation and fruit planting (Xing, Zhou, Gong, & Zhang, 2004). In 2003, in the context that wild parks were proposed and planned by the Shenzhen Municipality Government (as discussed in the previous section), botanists noted the necessity of protecting some endangered plants (Xing et al., 2004). Major construction firms – especially those state-owned ones – within the city also started paying more attention to ecological conservation.

Demands of local government for ecological conservation

Alongside the emphasis on environmental protection enshrined in national policy, urban leaders in Shenzhen have their own interest in introducing more stringent ecological regulations. Compared with economic growth based on low-technology manufacturing in the early years of Reform and Openness, technological capabilities have grown significantly in China’s economy since 2000, illustrating the rapid structural changes and industry upgrades that are taking place across the country. A series of developmental strategies underpins this economic transition that includes plans to shift from resource-intensive manufacturing towards a knowledge-, technology- and culture-based economy, which requires a greater emphasis on environmental protection and quality of life than was the case previously. Within this context, those cities that can are seeking to move to a higher level of economic development – a second stage growth model. This growth model focuses on the upgrading of local economies around knowledge, technology and skilled workers (Lu & Yehua, 2007; Xu & Yeh, 2005; Zhao, 2010). This vision in turn embodies, reflects and creates demands for increased levels of environmental protection, including the protection of environmental
amenities in order to attract and retain a burgeoning urban middle class (He, 2009). The 2000s thus witnessed increased emphasis within the city in moving away from production and distribution towards tertiary activity and the city’s need to retain its role as a strong player in intercity competition with respect to its command and information functions. This includes plans to shift from resource-intensive manufacturing towards a knowledge-, technology- and culture-based economy, entailing a greater emphasis on environmental protection and quality of life than was the case previously (Cartier, 2002; Ng, 2003; SDPB, 2002). This ‘high road’ economic development strategy (Malecki, 2004) entails greater emphasis on environmental protection and quality of life, which is one of the key factors in attracting investment and high-quality human resources in supporting a knowledge- and innovation-based economy. The application of certain types of green strategies also contributes to building up competitive advantages in terms of enhanced reputation, reductions in construction and operation costs, receiving favourable land prices, and more channels available for financing (Zhang, Shen, & Wu, 2011).

**Strengthened ecological conservation in the city of Shenzhen**

The Shenzhen Municipality Government was pressed to seek for a more effective strategy for ecological regulation. These pressures came from top-down state ecological regulation and the city’s need to reposition itself in the new round of regional competition and industrial upgrades. Moreover, pressure from society grew. From 2000 onwards, the city of Shenzhen has entered a new stage of economy-environment and society-ecology relations, representing a growing concern for environmental sustainability within the extant growth model. This has included the promulgation of a series of environmental policies and the integration of the ideology of ecological conservation into the local development strategy, as well as the designation of conservation reserves that are intended to protect the city’s environment and develop the city’s ecological infrastructure (see Table 1). In 2001, Shenzhen was designated the pilot city for implementing urban green space system planning by the Ministry of Construction. The city government began to extend the planning and management of ecological green spaces from ‘the parks’ to the waterways, wetlands, grasslands and other generalised ecological resources. Relying on the city’s large green corridors, river corridors, road corridors and biological corridors, a continuous ecological green network was formed to construct a control system for open spaces, in conjunction with the rapid urbanization of the city. It finally led to three types of ecological spaces, ecological, recreational and landscape, which were organised through the three spatial levels of suburban (forest) park – urban comprehensive park – community park. In 2003, the concept of ‘ecological regulatory boundaries’ was proposed in the Short-term Construction Plan of the city of Shenzhen for 2003–2005 (Shenzhen Municipality Government & UPDIS, 2003) (see Figure 2). Later, in 2005, this concept was incorporated into the Administrative Regulations of Shenzhen Municipality on the Essential Area of Protecting Ecology (Shenzhen Municipality Government, 2005), with an area of 1100 km² being included within the ecological regulatory boundaries. In the Comprehensive Plan of Shenzhen (2007–2020) (Shenzhen Municipality Government, 2007) published in 2010, the principle of ‘four districts’ was introduced and defined, including Construction Forbidden Areas (Article 42 compulsory), which are contained within the ecological regulatory boundaries that requires the strictest protection and ecological restoration; Construction
Restricted Areas (Article 43 compulsory), which are areas inside the regulatory boundaries yet beyond the Construction Forbidden Areas where strict regulation and protections would be applied, with specific projects being allowed in accordance with the requirements of the ecological regulatory boundaries; Constructed Areas (Article 44), which refers to existing construction areas where illegal structures are required to be demolished; and Areas Suitable
for Construction, which are areas where additional structures can be constructed (Article 45). Regional cooperation of ecological conservation and protection in terms of key ecological functional areas, especially nature reserves and scenic landscapes, was stressed in the Comprehensive Plan of Shenzhen (2007–2020) (Shenzhen Municipality Government, 2007), and a regional ecological compensation mechanism was established to strengthen the protection of water sources.

**Pressures against ecological conservation from pro-growth groups**

However, the story seemed not to stop. One special interest group that was involved in pursuing economic interests exerted pressure against ecological conservation. Local peasants whose lives were affected by the ecological conservation areas strongly denounced their implementation (Long, Liu, Wu, & Dong, 2009; Wu & Lv, 2009). Since the initial stage of the city's development, local peasants have been actively involved in productive activities through renting land for factories; they also established their own Community Corporation in the processing and assembling industry. When the designation of protected areas restricted local peasants' access to resources, illegal structures and petitions became a channel for them to initiate environmental debates prior to decisions, hamper the implementation of certain decisions and challenge the legitimacy of decisions afterwards. The results of continual monitoring by the Planning Bureau show the existence of 'illegal' structures inside the conservation boundaries. In 2006, 45.48 km² of land was found to have illegal structures. An additional 17.93 km² of land was identified as having illegal structures in 2007, and another 57.2 km² were added in 2008 (Interview, Shenzhen Municipality Government official no. 4, 2009). These areas include some development activities accompanied by some 'full-blown resorts' (Zacharias & Tang, 2010) and illegal structures built by local residents.

The local deputies to the National People's Congress (NPC) continually submitted proposals to the People's Congress to request adjustment of the location of ecological reserves. For instance, the deputies to the NPC from Long'gang Street in Bao'an District submitted a proposal entitled 'An appeal for issuing environmental approvals of existing factories that are located inside ecological regulatory boundaries' (2006) to the People's Congress. They argued that the difficulties experienced by existing factories in obtaining environmental approvals had enormously hindered local economic development and social stability (Songgang Street Government, 2006). In the same congress on 24 March 2007, 39 deputies to the NPC of Long'gang District submitted to the People's Congress the ninth proposal that insisted that a rational and reality-based statutory procedure for designating ecological regulation boundaries was essential for maintaining local economic development and social stability. In the Fifth Conference of the Fourth Session of the Municipal People's Congress in 2008, Deputy Zhang again submitted a proposal suggesting that the ecological regulatory boundaries should be further optimised (Sun & Yi, 2008).

**Conclusion**

The paper aims to understand changing approaches to ecological conservation policy within the political economy of urban development in China. To achieve this aim, a case study on the city of Shenzhen was selected. Based on historical review of the city’s ecological
conservation policies, the paper has further explored the institutional structure of decision-making at the city scale, including the role of different pressure groups in Chinese cities.

It was found that, during the past three decades, the ecological conservation policy of the city of Shenzhen has shifted away from comparatively weak ecological regulation towards a stronger set of principles, which has led to a range of ecological areas being designated as protected areas. Within the new discourse of national economic transition and inter-city competition, the comparatively stronger ecological regulatory regime is best understood as a biophysical fix, which is part of a project on the part of the local government to reposition and restructure the city following its rapid economic and population expansion through to balanced development with a greater degree of ecological protection. In the context of the emerging new phase of ecology-based development, the city of Shenzhen appears to have an increasing need for ecological conservation in order to retain its role as a strong player in intercity competition with respect to its command and information functions. It is also the case that decision makers at the city scale have to start taking into account a range of pressures and forces that favour ecological conservation that originate in society. Empowered by international value positions and national ideology, a range of actors and groups are increasingly focusing their attention on environmental externalities and getting involved in creating pressure for ecological conservation in China. They include international and domestic experts who are involved into the processes of planning and policy formulation, censoring and approval, as well as supervision of ecological conservation-related issues; an emerging ENGO sector, the activities of which are restricted by governmental intervention in the domains of environmental education and exhibition, workshops and conferences, salon discussions, field trips and the publication of newsletters; estate developers; increasing local activism and complaints; and critical environmental coverage in the mass media, especially local newspaper and internet forums (Fu, 2004; Yang, 2005; Zeng, 2009) and the ‘Weibo’ (micro-blog) system. In fact, the case of Shenzhen showed that the city of Shenzhen has tried to transfer decision-making power from the formerly enclosed governmental regulatory bodies to the wider society through the establishment of the UPBSZ (which is made up of governmental officials, experts and social actors), though with appropriate limitations. All of these pressures for ecological conservation may entail making difficult decisions to prioritise projects and activities that may have endangered the outcomes of ecological conservation (While et al., 2010). However, the abovementioned pressures and incentives for ecological conservation do not necessarily mean an optimistic future. Decision makers at the city scale still need to face challenges or pressures against ecological conservation from pro-growth coalitions, which involve governmental departments and non-governmental actors. The pro-growth interest binds local bureaucracy at the scales of the city, individual districts, and streets to enterprises and inward foreign capital into an informal coalition to address regional competition and to circumvent central pressure for revenue submission (Zhu, 1999a). The demands of most of the pro-growth coalitions on converting additional land resources into local development (Zhu, 1999b) may shape pressures against ecological conservation in local decision-making. This is especially the case given the rapid urbanization process of the country.

Compared with other cities in China, the city of Shenzhen is distinctive because of a range of social, economic and political factors, including its comparatively broad and deep cooperation with international organizations and agencies; its relatively rich local revenue
in supporting ecological conservation activities; its flexibility and autonomy in formulating, promulgating, adopting and enforcing its own environmental regulations and decrees (including a pioneering planning system in promoting strong enforcement of city control and spatial regulation); and a more democratized civil society than other cities in China. Although there are particular factors acting in Shenzhen that lead to a distinctive new urban politics of ecological protection, as reflected by the case study, it may represent a broader shift underway in the country. In this new paradigm, the city’s focus on growth has given rise to the prioritisation of ecological conservation in the decision-making of the local government. As noted by some workers (Oksenberg & Tong, 1991), Chinese cities have recently experienced an entrepreneurial growth paradigm that aims at attracting inward investment, increasing local financial revenues and promoting competitiveness (Ma & Wu, 2005; Wu & Zhang, 2007). Within the context that environmental interests are being institutionalised in the economic domain of prices, markets, and competition at both national and international scales, the quality of life, including ecological conservation, has been determined by local decision makers as being an essential factor in promoting a knowledge and innovation-based economy (Wu & Zhang, 2007). Because it is also shaped by a range of pressures and forces within the broader society, the growth scenario of Chinese cities has given rise to a high priority of ecological conservation in the decision-making of the local government. Both alarm and optimism could be expected from this. Alarm, because the new conservation paradigm might be framed within the context of a liberalisation and marketization of ecological policy. Indeed, there is evidence that the newly emerging ecological paradigm seems to have promoted the proliferation of various conservation-with-development projects across China, underpinned by an ideal to combine nature conservation and economic gain, for instance ecotourism projects (Tisdell, 1996; Wen & Tisdell, 2001). However, there may be grounds for optimism related to the emerging new paradigm, because it may entail some change in local economic development activities to be consistent with ecological conservation goals, as is the case in the Shenzhen case study. It is also possible to expect the Shenzhen experience to be reflected to some degree in other cities as China moves to a different stage of development and as urban development comes up against a new ecological management paradigm.

This study provides further evidence that ecological conservation is a contested political activity (Gibbs et al., 2007; Whatmore & Boucher, 1993), providing further empirical evidence of the ways in which decisions about ecological regulation – regulation in favour of nature and ecology – are intertwined with human livelihoods, lifestyles and economic interests (Adams & Hutton, 2007; Gibbs et al., 2007; Whatmore & Boucher, 1993). One of the particular contributions of the paper has been to highlight ways in which ecological policy might be used by governments (the state) to serve interests in social and spatial restructuring, and this provides further evidence that ecological conservation policy and the designation of boundaries needs to be placed within the wider politics of and urban development (While et al., 2010). It has been seen that the designation of ecological reserves in Shenzhen is part of broader strategies to reorder state space serving socio-political as well as ecological ends. By taking a ‘non-western’ perspective, the paper does not necessarily fit with conceptions of nature conservation based on a hierarchy of designations imposed top-down in a strong nature-first paradigm (Adams, 1997). Rather, the paper maps out a slightly different dynamics of ecological urban politics based around the strategies for regulating
growth. Ecological governance in Shenzhen was not necessarily just about securing a ‘biophysical fix’ in response to pressures and demands nature conservation, but reflected the use of ecological arguments to help support a re-regulation of society and space as the city moved to a new phase of development.

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