An Introduction and Comparative Study of the Implementation Approaches of Beijing's Green Belts

8th Conference of IFoU
Icheon, Korea, June 2015

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1\ Introduction

- Population and Built-up Land Expansion in China's Mega-cities

Beijing

Shanghai

Guangzhou

Picture Source: the internet:
http://www.kdslife.com/thread_1_20_7681006_1__TRUE.html etc.
1. Introduction

- Green Belt and Urban Growth Boundary As Urban Containment Policies

**Green Belts in England**


**Melbourne 2030**

Picture Source: http://www.nre.vic.gov.au/melbourne2030online/content/implementation_plans/02a_about.html

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Question:

1. How to localize these theories to solve the problems in fast growing Asian (or China’s) cities?

2. How to implement the Urban Containment Policies effectively in urban fringe?
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1. Policies and Implementation Approaches

- Plan

Public Green Spaces

Landscape and Farmland

Concept Map of Beijing’s Green Belts

Legend
- Tian’anmen, City Center
- Neighbourhood, Town and Township Boundary
- Inner Ring of Green Belt
- Outer Ring of Green Belt
- Ring Road

Picture Source: by author

Picture Source: From the Internet

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# Policies and Implementation Approaches

## Policy

### Chronological Beijing’s Green Belts Major Policies

<table>
<thead>
<tr>
<th>The Year of Enactment</th>
<th>Official Document Code</th>
<th>Main Funding Source</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>Capital Planning Committee [1986]2</td>
<td>1 Township and Village Enterprises 2 Nursery Garden</td>
<td>Guidance</td>
</tr>
<tr>
<td>2000</td>
<td>Beijing Government Office [2000]20</td>
<td>1. Real estate development 2 Subsidies 3 Loan from financial institution 4 Commercial projects, like sports fields and recreational facilitates 5 Green Belts Industrial Land</td>
<td>Subsidies, Market Forces and Regulations</td>
</tr>
<tr>
<td>2008</td>
<td>Beijing Government [2008]17</td>
<td>1 Subsidies 2 Green Belts Industrial Land</td>
<td>Subsidies, Market Forces and Regulations</td>
</tr>
</tbody>
</table>

Table Source: by author
1 Policies and Implementation Approaches

Implementation

Agent-based Market Model Illustrating the Development Process in Fringe Zones

Policies and Implementation Approaches

Implementation

Agent-based Game Analysis of the Development Process in Urban Fringe Zones

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Methodology

- Overall Analysis
- Remote Sensing, GIS
- Comparative Study
- Document Research (WL, DS), Interview (CGZ, HZH)

Data

Remote Sensing Data Description

<table>
<thead>
<tr>
<th>Data ID</th>
<th>Date of Collection</th>
<th>Longitude (° E)</th>
<th>Latitude (° N)</th>
<th>Cloudage (%)</th>
<th>Sensor</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC81230322014279LGN00</td>
<td>2014-10-06</td>
<td>116.72</td>
<td>40.33</td>
<td>1.06</td>
<td>Landsat 8 OLI_TIRS</td>
<td>30*30m</td>
</tr>
<tr>
<td>LT51230322003121BJC00</td>
<td>2003-05-01</td>
<td>116.70</td>
<td>40.44</td>
<td>0.0</td>
<td>Landsat 4-5 TM</td>
<td>30*30m</td>
</tr>
</tbody>
</table>

Data Source: USGS, Website: http://earthexplorer.usgs.gov/
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4 \ Overall Analysis and Sample Selection

- Step 1: Land Coverage Classification (ENVI 4.8)

Land Use Classification Results

Legend
- Built-up Land
- Bare Land
- Vegetation-covered Area
- Areas Paved with Rigid Materials
- Water

Picture Source: by author
4 \ Overall Analysis and Sample Selection

- **Step 2: Land Use Type Reclassification and Combination (ArcGIS 10)**

  Built-up Land and Unbuilt-up Land within the Two Rings of Green Belts

![Map showing built-up and unbuilt-up land in 2003 and 2014 within the two rings of green belts.](Picture Source: by author)

Legend:
- Light blue: Unbuilt-up Land within the Inner Ring
- Dark green: Unbuilt-up Land within the Outer Ring
- Black: Built-up Land

Picture Source: by author
4. Overall Analysis and Sample Selection

**Step 3: Unbuilt-up Area Proportions Calculation (ArcGIS 10)**

The Proportions of Unbuilt-up Area in Towns and Townships

![Maps showing the proportions of unbuilt-up area in 2003, 2014, and the change rate from 2003 to 2014.](Picture Source: by author)
4\ Overall Analysis and Sample Selection

- Sample Selection

Standard:

1\ The sample areas can well represent the four implementation approaches mentioned above.

2\ The sample areas involve both the inner and the outer ring and vary in locations.
4 \ Overall Analysis and Sample Selection

- **Sample Selection**
  (Left) the locations of selected sample areas. (Right) Land use plans of selected sample areas.

Picture Source: by author
## Overall Analysis and Sample Selection

### Sample Selection

<table>
<thead>
<tr>
<th>Implementation Approach</th>
<th>Specific Development Way</th>
<th>Typical Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>government direct participation – property</td>
<td>Large Urban Project (e.g. the Olympic Games)</td>
<td>WL*</td>
</tr>
<tr>
<td>developer nonintervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>government direct participation – property</td>
<td>Land Banking</td>
<td>CGZ</td>
</tr>
<tr>
<td>developer intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>government nonparticipation – property</td>
<td>Townships’ Autonomous Cooperation with the Property Developers</td>
<td>DS</td>
</tr>
<tr>
<td>developer intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>government indirect participation – property</td>
<td>Higher-level Project Settlement</td>
<td>HZH</td>
</tr>
<tr>
<td>developer intervention</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table Source: by author
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Contextual Elements

**Similarity**
- State or regional elements, e.g. History and Traditions
- Governance style, e.g. governmental structure, planning procedures

**Difference**
- Economy, including economic activities, industries and property prices
- Quantity and quality of stakeholders, farmers support for implementation
5 \ Comparative Study

### Process

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</tr>
</tbody>
</table>

- Beijing City Master Plan (2004-2020) came into effect.
- Beijing 2008 Olympic Games

Picture Source: by author
5 Comparative Study

Results

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</table>

Before Implementation

2000

2007

2009

2014

Picture Source: by author

Government-dominant

Market-dominant
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## Conclusion and Discussion

### Comparison of 4 Implementation Approaches

<table>
<thead>
<tr>
<th>Implementation Approach</th>
<th>Specific Development Way</th>
<th>Scope of Application</th>
<th>Advantage</th>
<th>Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government direct participation – property developer nonintervention</td>
<td>Large Urban Project (e.g. the Olympic Games)</td>
<td>The townships where a large urban project location is selected.</td>
<td>The plan can be completely implemented.</td>
<td>• A heavy burden on fiscal expenditure.</td>
</tr>
<tr>
<td>Government direct participation – property developer intervention</td>
<td>Land Banking</td>
<td>The townships involve both urban fringe group and green belts in plan and land prices are high.</td>
<td>Market mechanism is sufficiently used to drive plan implementation and urban regeneration</td>
<td>• There exists market failure (e.g. in the proposed built-up area villages can be demolished smoothly, but in green belts area there lacks impetus for demolishment and afforestation)</td>
</tr>
<tr>
<td>Government nonparticipation – property developer intervention</td>
<td>Townships’ Autonomous Cooperation with the Property Developers</td>
<td>The townships where large urban projects and land banking are not applicable.</td>
<td>Market mechanism is sufficiently used to drive plan implementation and urban regeneration and administrative approval procedures are simplified.</td>
<td>• Township government may lack bargain power.</td>
</tr>
<tr>
<td>Government indirect participation – property developer intervention</td>
<td>Higher-level Commercial Project Settlement</td>
<td>The townships where market forces are weak. (e.g. due to poor location)</td>
<td>The deterioration can be inhibited by the government intervention and fiscal support.</td>
<td>• It takes long time for a large project to go through the complicated official process of ‘proposal-site location-planning approval-design-build’.</td>
</tr>
</tbody>
</table>

Table Source: by author
6 Conclusion and Discussion

To be continued

1 How to improve the effectiveness of plan implementation and to decrease the proportion of built-up land under each approach?

2 Whether this kind of project-driven implementation is better than act- or regulation-driven way which is common in western countries?

3 How to make the sample areas more representative and how is the implementation in the other townships?

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Thank you for your attention!

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