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University of Tsukuba
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Development of land-use map database in urban area

: a case of fieldwork in University of Tsukuba


Jun Kaneko
University of Tsukuba
jkaneko@geoenv.tsukuba.ac.jp
<http://www.geoenv.tsukuba.ac.jp/~region/>

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Purpose

To examine database-making process of **land-use map** and effectiveness of **land-use survey**

Method of **land-use survey** using **field work** and **GIS** in urban area at the micro scale

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Background

Dr. Saito(1997) said:

- To experience land-use survey in urban or rural field
- Not only!** To describe simply kind of cultivated crops or use of buildings
- Possible to understand historical and cultural backgrounds in the region
- Possibility for opening a new vista of the future study


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Background

Questions of land-use survey at the micro level

- × Used as only a *"picture"*
- × Arbitrary selecting survey area, lot and survey item
- × **Qualitatively** description



Morimoto et al.(2003) :
Efficient methods of land-use survey by using GPS and GIS

Tsutsumi(2009) :
Mechanism of changing urban land-use as *"Black Box"*

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Land-use survey in urban area

Dynamics of land-use pattern in central urban area

How is a land-use pattern at the micro scale compared?

Past ↔ Present ↔ Future

- × Dependent on researcher's experience, memory & feeling

Importance of data-setting at the **present** survey

Attempt to build continuously-available database of land-use

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Land-use survey in urban area

Big topics of Japanese cities:

→ Hollowing and vitalization of central urban area

What characteristics does the central urban area have?

What can I observe there?

- ✓ Increase in vacant shop
- ✓ Changing kind of business
- ✓ Diversion shop to parking space or house
- ✓ Trading area
- ✓ Main customer
- ✓ Vertical utilization of building



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Case study

Field work program in human & regional geography divisions, graduate school, Univ. of Tsukuba

Setting several themes in a specific region

agriculture, industry, resident organization, tourism, shopping street, redevelopment of town, wild animals, etc...

Land-use survey in a central urban area

Output ← Hand work method
Insufficient utilization for each studies

Awareness of the issues:

- ✓ to compare the present data with the past or future
- ✓ to overlay electronic data with hand work data

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Case study

Fields: Central urban areas of 2 local cities in Nagano Pref.

• Case 1: Suzaka City (2009-10)

- ✓ Pop. 52,760
- ✓ Key junction of roads during the Edo period
- ✓ On the alluvial fan
- ✓ Commercial core in the past
- ✓ Remaining many traditional storehouses
- Historic landscape conservation
- Changing of commercial structure



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Case study

• Case 2: Iida City (2011-12)

- ✓ Pop. 105,335
- ✓ Castle town during the Edo period
- ✓ A central place of South-Shinshu region
- ✓ On river terrace (called "on the hill town")
- ✓ Opening of a new bullet train in the future

Movement of the redevelopments
Changing commercial function



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Field work method



項目	内容	備考
1. 調査対象地域	〇〇市〇〇区	
2. 調査対象建物	〇〇番地	
3. 調査対象者	〇〇氏	
4. 調査日時	〇〇月〇〇日	
5. 調査方法	〇〇法	
6. 調査結果	〇〇	
7. 調査者	〇〇氏	
8. 調査機関	〇〇大学	
9. 調査経費	〇〇円	
10. 調査報告書	〇〇	



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Field work method

Major classification of land-use	Color	Middle classification
Retail & Service	■	supermarket, CVS, liquor, pharmacy, bicycle, barber, clinic, cleaners, hotel, restaurant, pub, bank, vacant store, etc...
Retail & Service -cum- Residence	■	same as above
Residence	■	single-family house, condominium, apartment house, residence with tenants, empty house
Industry & Research	■	construction, others
Public	■	education, community center, police station, post office, etc...
Religion	■	temple, shrine, church, cemetery, others
Parking	■	
Park	■	
Cultivated site	■	

Field work method

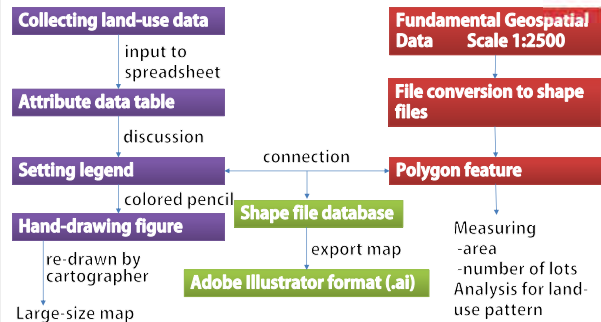
Further data:

- Components of landscape:
Color of façade, Type of roof,
Type of grating
 - Free description:
Shop name, Chain store or not, Type of
parking, Kind of business, etc...
- ➔ Importance of primary data



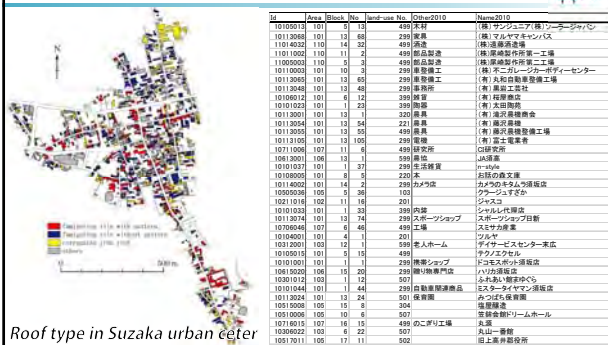
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Making database



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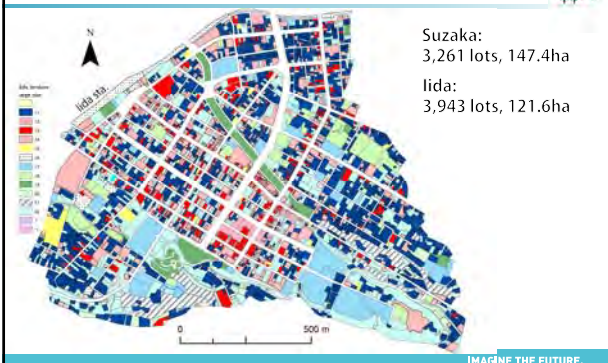
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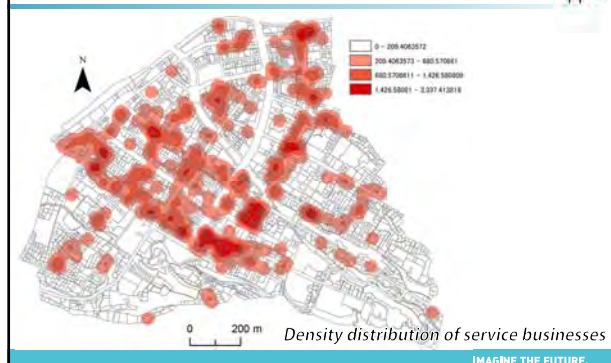
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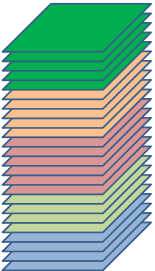
Making database



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Future plan

- To overlay various micro-data with land-use database
census, economic statistics, former town border, water area, DEM, etc...
- To store and utilize the land-use database
Can we use the database at anytime?
How do we utilize and add the database?
Is the database variable in response to users?



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