The potential influence of nursery offerings on tree species diversity in new Beijing plain afforestation

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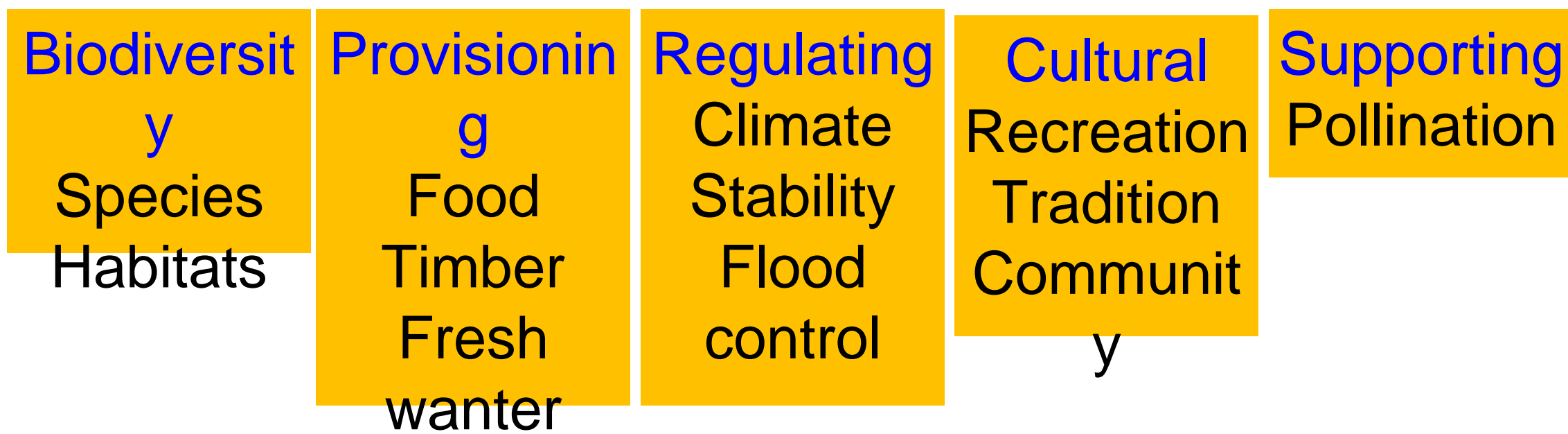
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OUTLINE

- Background

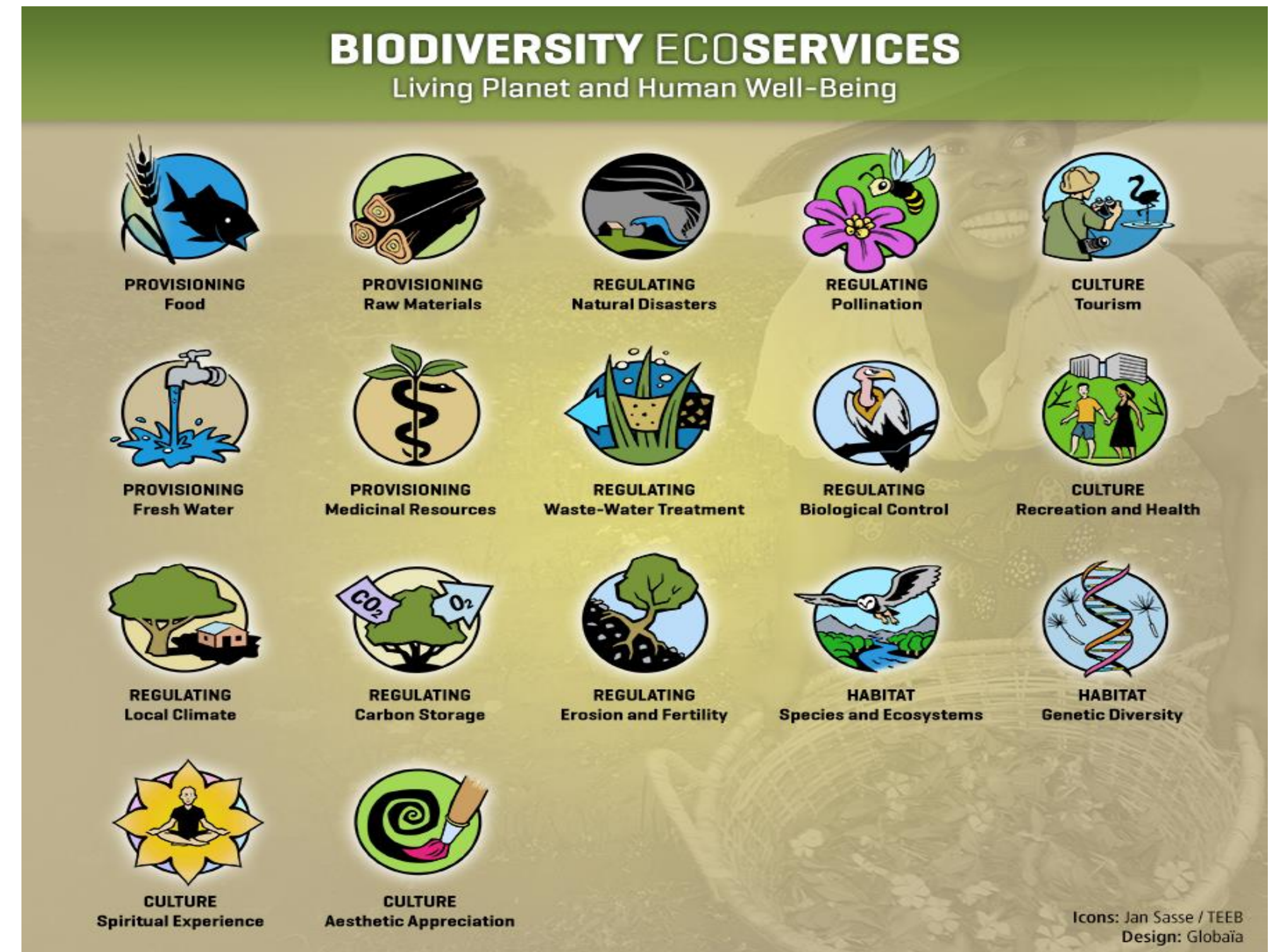- Data and methods

- Results and discussions

- Conclusions

Background

- Urban forests have numerous environmental, economic and social benefits, contributing enormously to the health and welfare of everyone who lives and works in urban areas (Arsal & Johar, 2016.

Biodiversity	Provisioning	Regulating	Cultural	Supporting
Species Habitats	Food Timber Fresh wanter	Climate Stability Flood control	Recreation Tradition Community	Pollination

(Daily et al. 2009)

- Urban biodiversity is considered to be the foundation of a healthy urban ecosystem (Yang et al, 2016).

BIODIVERSITY ECOSERVICES
Living Planet and Human Well-Being
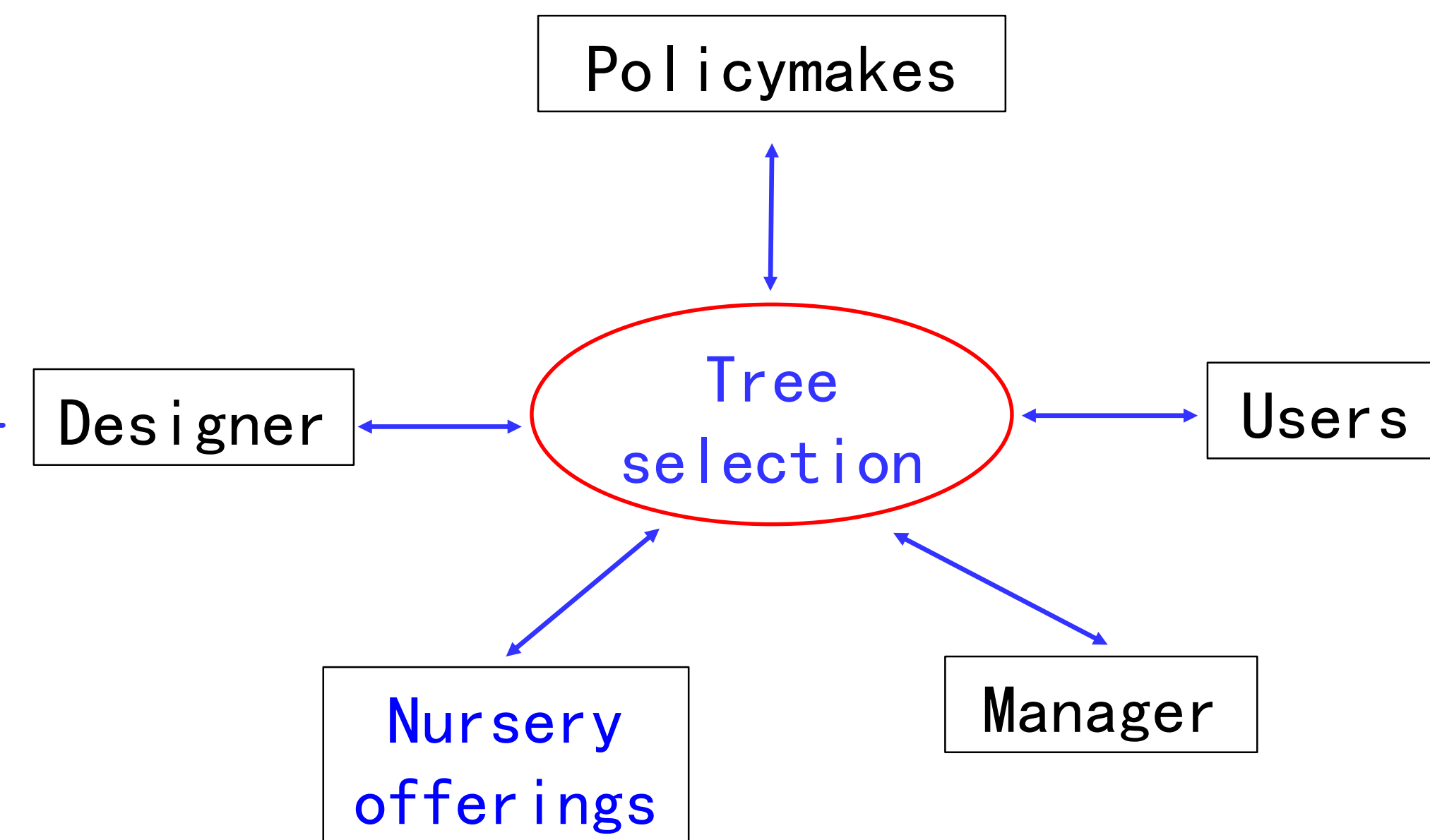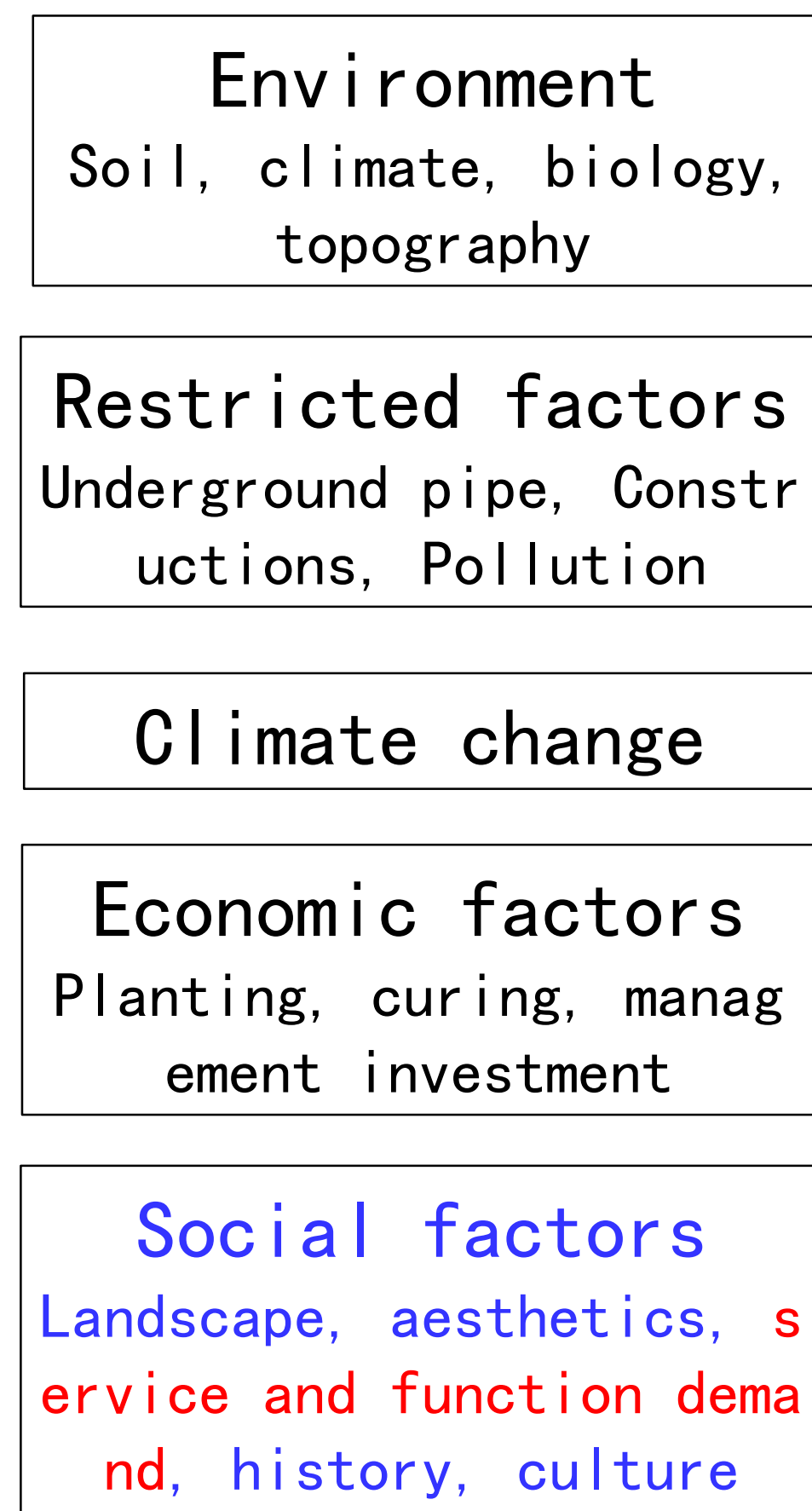
Background

- Most of the urban forests in China are artificial forestation.

- There were many factors influencing the selection of trees when they started afforestation, such as price, nursery offerings, and plant positions (Avolio et al, 2018).
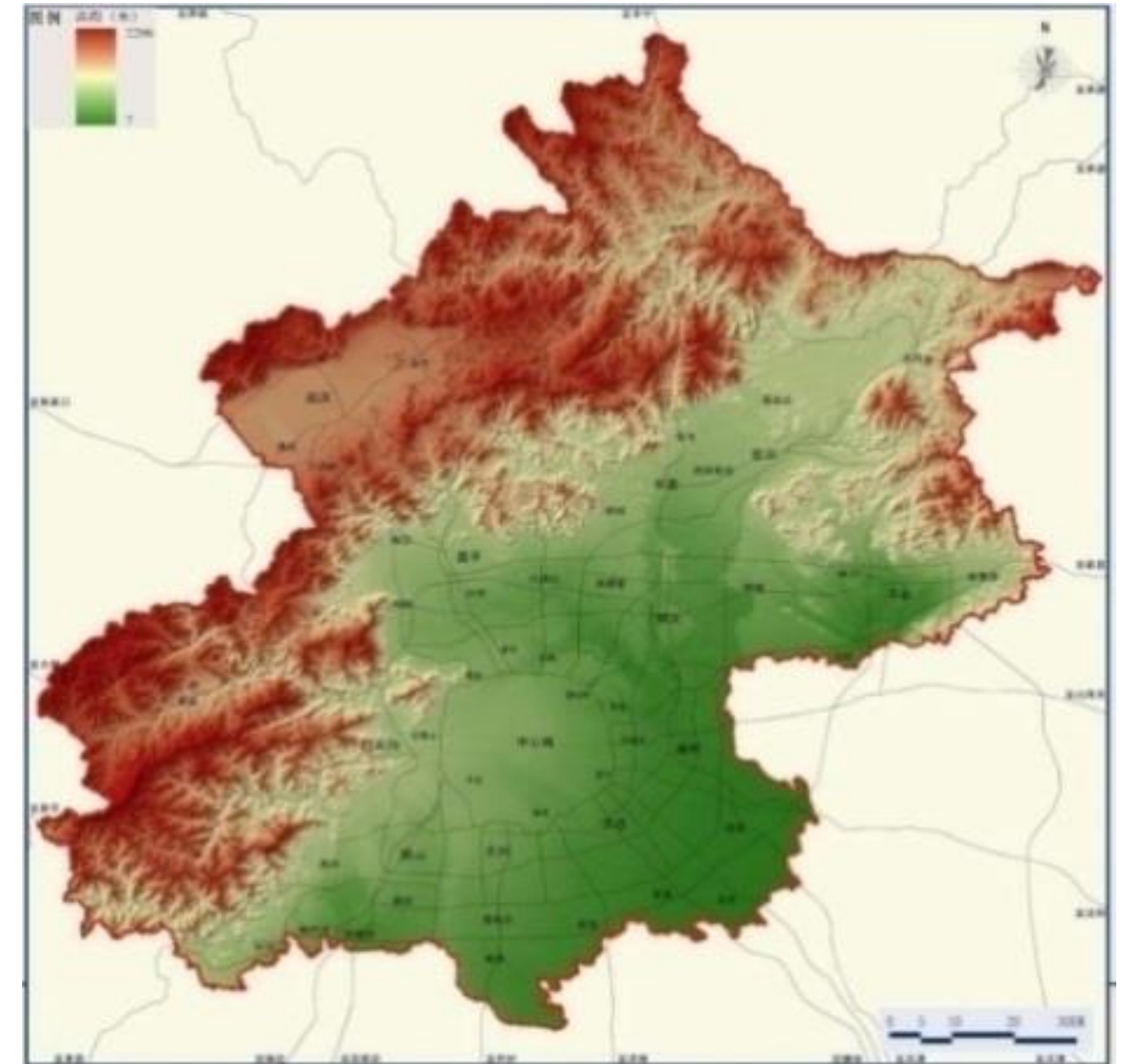
Nursery offerings is one of the key drivers of urban tree community composition and diversity.

Environment
Soil, climate, biology, topography

Restricted factors
Underground pipe, Constructions, Pollution

Climate change

Economic factors
Planting, curing, management investment

Social factors
Landscape, aesthetics, service and function demand, history, culture

Designer

Policymakes

Tree selection

Users

Nursery offerings

Manager

The tree selection patterns

(Translated from Wu and Wang 2016)

Background

- Beijing is the capital of China.

- Total area of 1,6410 km² with 21.69 million people.

- Plain area is about 6,338 km², accounting for 38.6% of the total area.
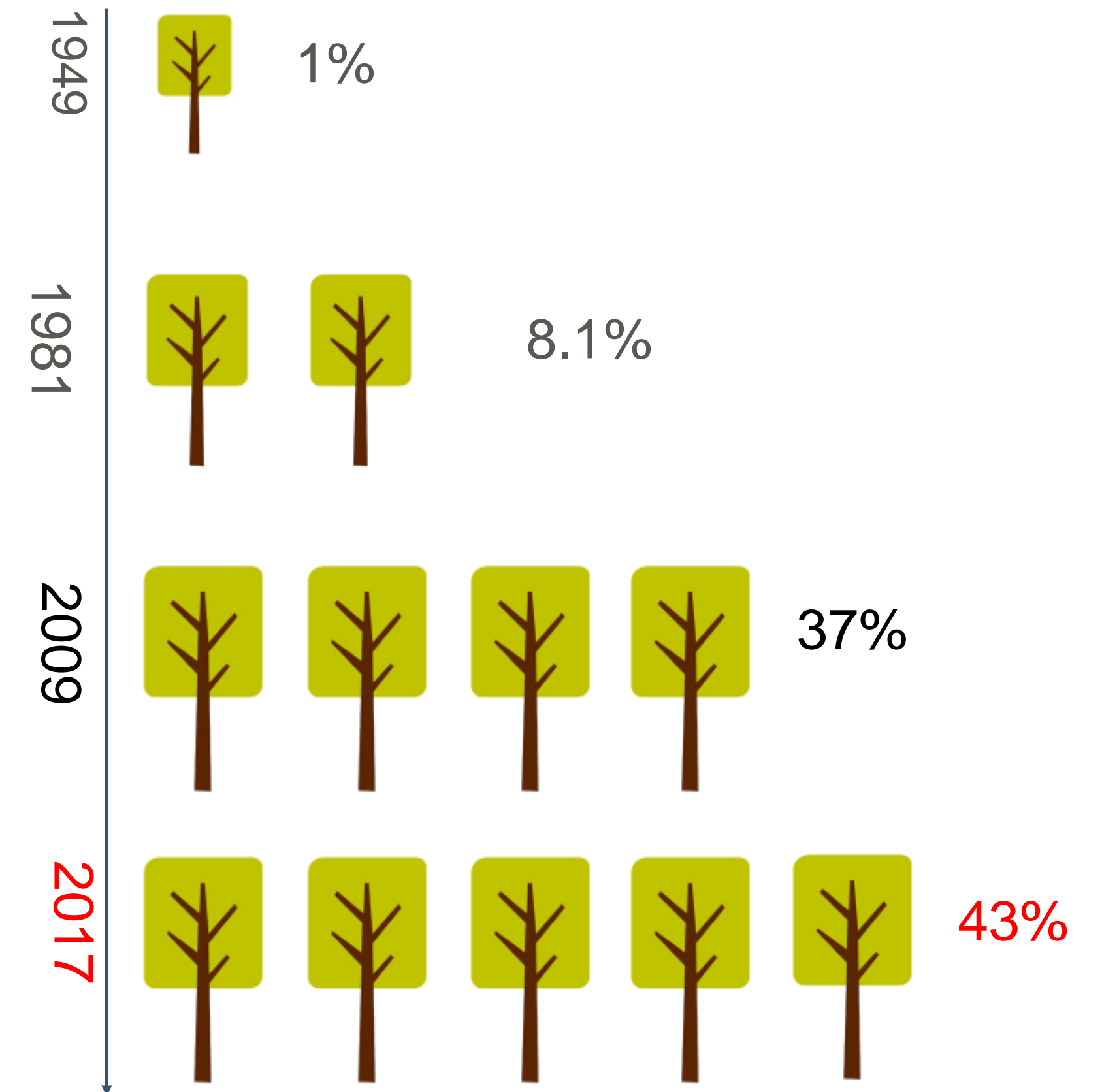

Administrative region of Beijing

Background

- Most people live in the plain area of Beijing.

- Forest coverage rate in plain was only 14.85% in 2011.

- The Plain Afforestation Project (2012-2014) increased nearly 10% of forest coverage in plain area.

- 54 million trees, belonging to 77 tree species and 99 shrub species

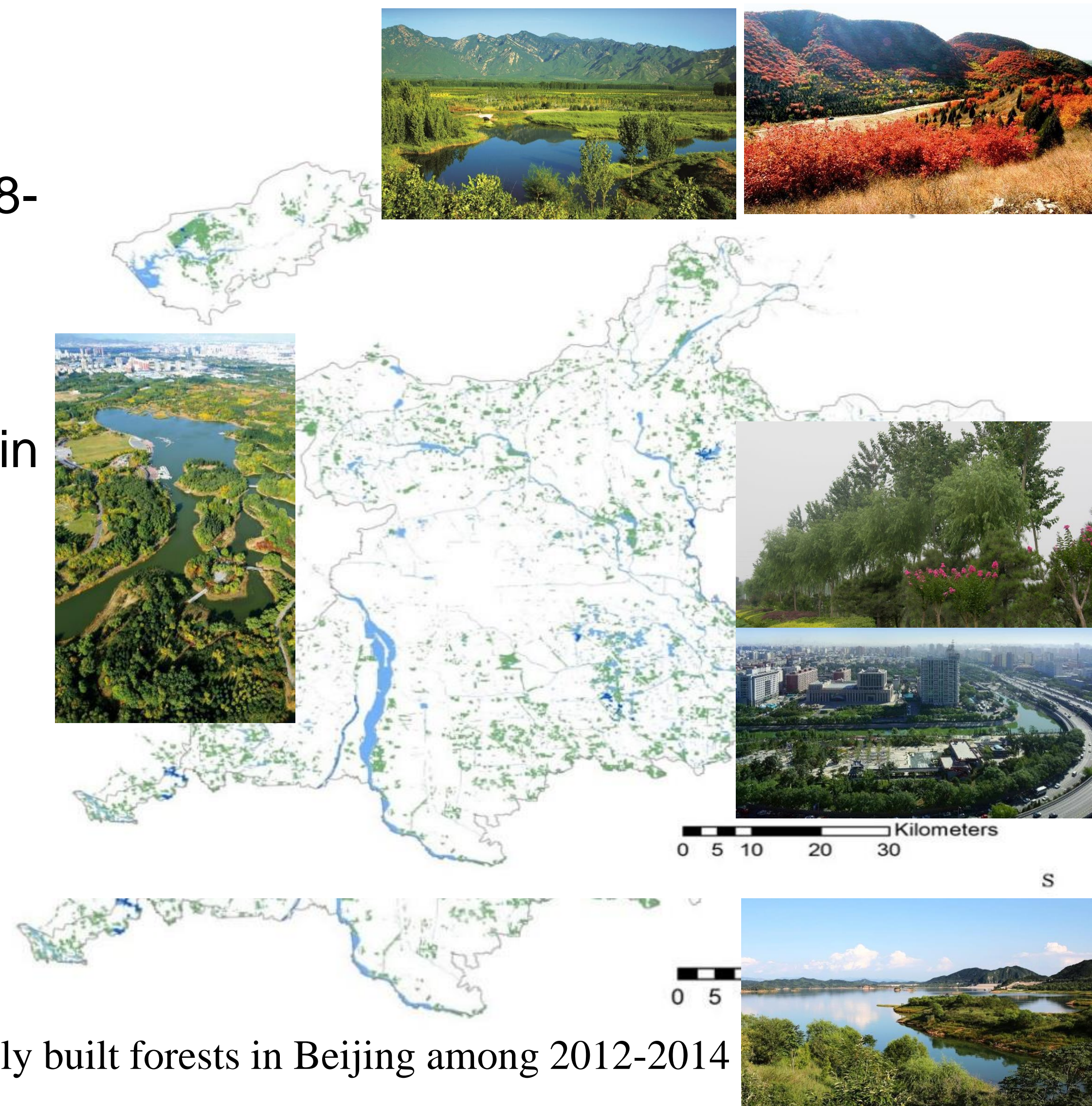- Forest coverage rate in plain is 27.81% in 2017.

The Plain Afforestation Project
（2012~2014, 1million mu= 67 thousand ha）

1949 — 1%

1981 — 8.1%

2009 — 37%

2017 — 43%

Forest coverage rate in Beijing

(Made by Cheng Wang)

Background

- Another One Million Mu Afforestation Project in 2018-2020 (67 thousand ha) is being started, aiming at raising the forest cover rate to 45%.

- However, there is limited information about nursery in and around Beijing:

  (1) the number of seedlings;

  (2) the construction of seedling species;

Newly built forests in Beijing among 2012-2014

Data and Method

- According to the implementation rules, the distance of nursery offerings from Beijing should be less than 600 km.

- We investigated tree species in nurseries from four provinces within this distance. They are Hebei, Shandong, Shanxi and Liaoning provinces.
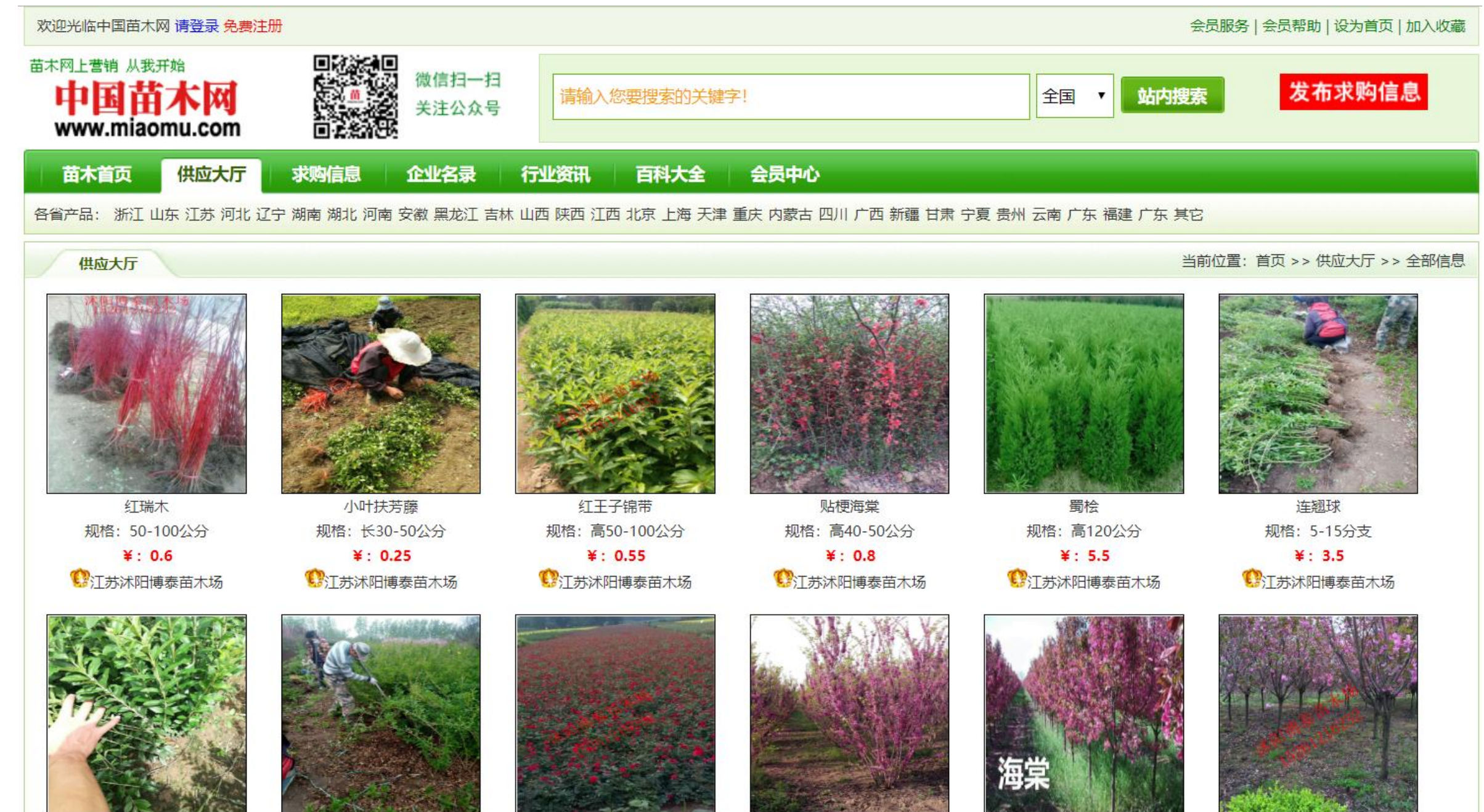

Nursery offerings for Beijing afforestation

Data and Method

- Data was obtained from tree selling advertisements on a website (http://www.miaomu.com).

- This website was built in 2000 and is the largest platform for selling seedlings in China.

- Tree species, growth traits, price and nursery names were recorded from advertisements in 2018.

- Until now, we collected tree species data from 285 nurseries belonging to companies and farmers.

Major Results

World Forum on Urban Forests
Mantova 2018

- There were 165 tree species.

- However, only several species were mostly grown such as *Sophora japonica*, *Fraxinus chinensis* and *Platanus orientalis*.

- There many native species of local plant community are not grown in nurseries.

Groups	Afforestation 2012-2014	Nursery offerings
Woody species	159	120
Tree species	107	65
Shrub species	52	55
Families	37	29
Genera	79	53

Tree species	Ratio	Shrub species	Ratio
Pinus tabuliformis	15.6	*Jasminum nudiflorum*	37.44
Sophora japonica	7.06	*Rosa chinensis* Jacq.	11.09
Ginkgo biloba	7.06	*Rhododendron farrerae*	7.86
Robinia pseudoacacia	6.48	*Amygdalus triloba*	5.79
Fraxinus chinensis Roxburgh	5.3	*Buxus sinica* (Rehd. et Wils.) Cheng	4.24
Salix matsudana	4.83	*Amorpha fruticosa* Linn.	3.34
Prunus cerasifera 'Pissardii'	4.33	*Lonicera maackii* (Rupr.) Maxim.	3.23
Ulmus pumila cv.jinye	4.02	*Buxus bodinieri* Levl.	2.93
Populus tomentosa	3.97	*Sorbaria sorbifolia*	2.63
Koelreuteria paniculata	3.42	*Syringa oblata* Lindl.	2.34

**Thanks for your attention!
Welcome to China!**

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