

CASE STUDY I

Network Analysis of Market Fairs of Huabei(華北) in the Late Qing China

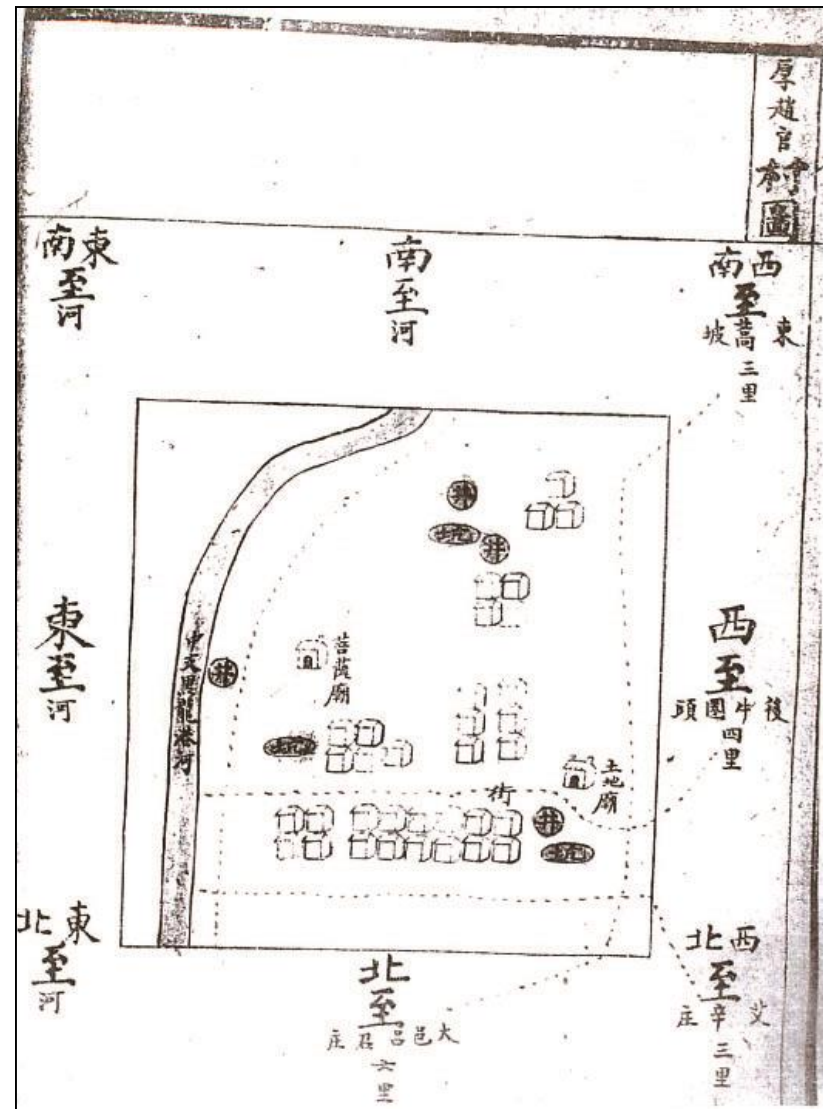
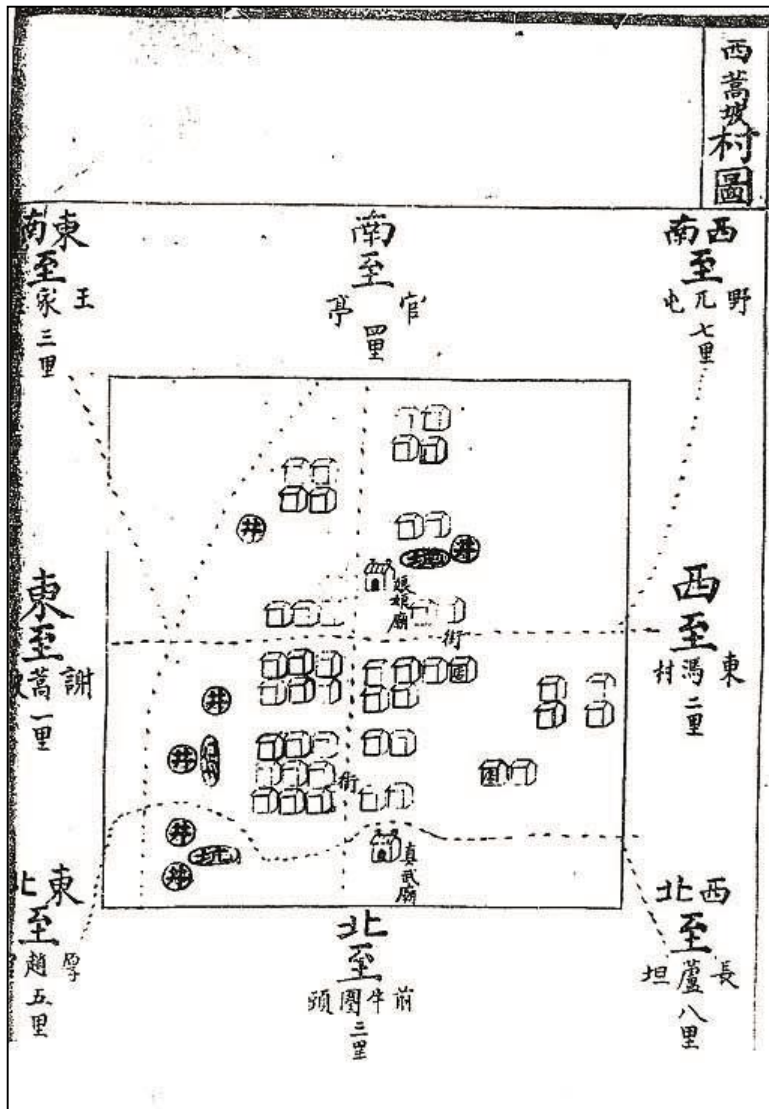


The attribute data of village description in Shenzhou (深州). Hebei Province(河北省)

權量	客店	廟宇	廟會	田賦	橋閘	津澆	河渠	井泉	禾稼	桑麻	瓜果
斗衡斛二十升稱拾六兩尺拾寸	無	無	無	民地二十畝 應完銀五錢	無	無	無	公用磚井一眼水苦	宜種紅麥高糧玉米黍穰蠶豆	無	無

青縣	東至	南至	西至	北至	東南至	西南至	東北至	西北至	戶口
城西南鄉本城鎮保甲所管之馬家房村距城二十里	齊家營 村距本村 二里	批 庄 村距本村 六里	潘趙官 村距本村 三里	邑大呂召庄 村距本村 五里	西王營 村距本村 三里	大趙官 村距本村 四里	羅 庄 村距本村 三里	邑大孫召庄 村距本村 四里	共二 戶男丁 三五 名婦女 六一 口

Geographical information of village maps



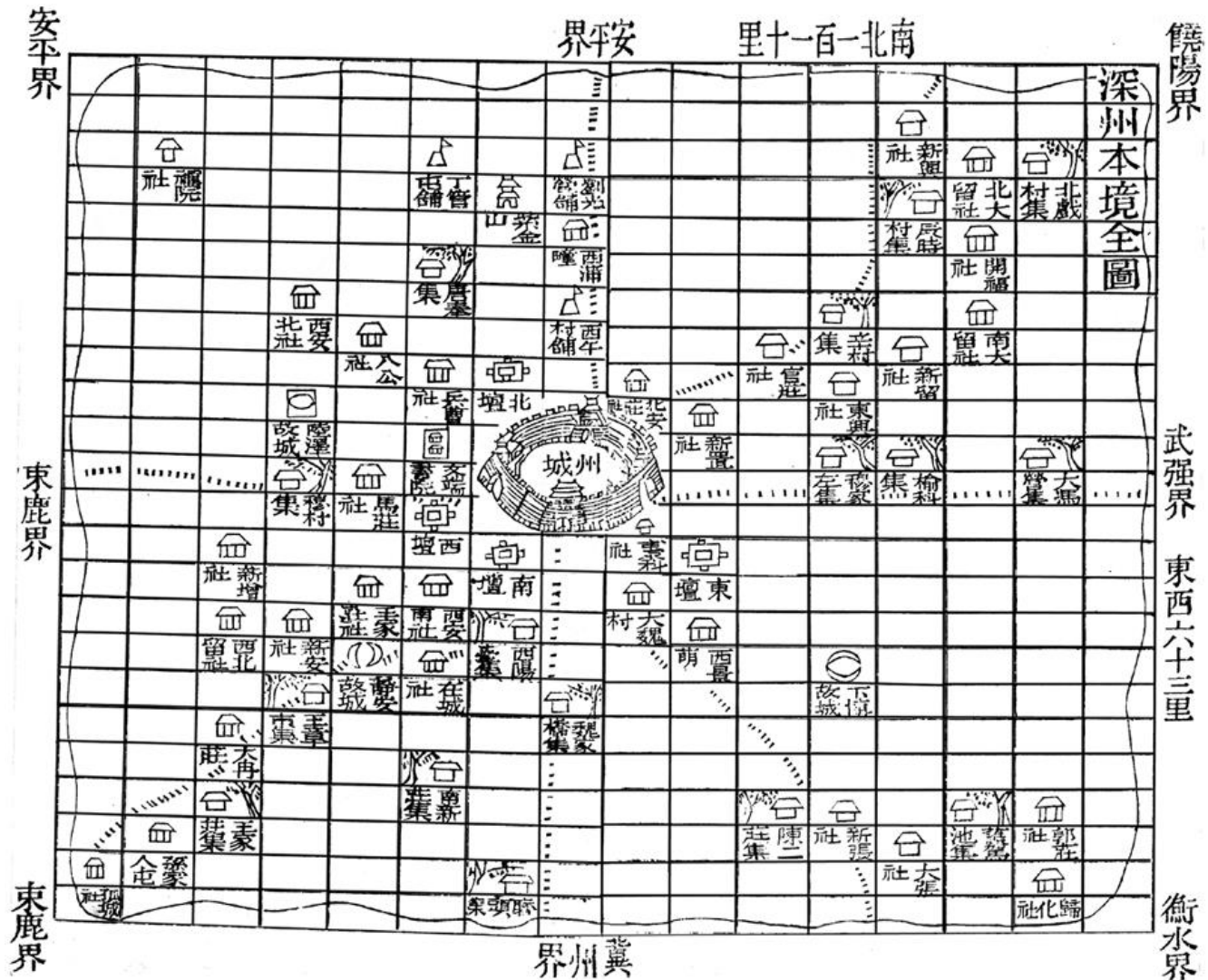
The illustration of Market Fair and Distribution of Villages

羅莊	正西十五里	在城	賈家莊	正西十六里	在城
南街	東南二里	舊南街鎮	河溝	正南一里	南街 亦稱尹家河溝
戴家園	東南三里	南街	鮑家嘴	東南三里	南街
小堤	西南三里	南街	雙廟堤	西南五里	南街
靳劉莊	東南五里	南街	東擺渡口	東南八里	南街 舊志合稱擺渡口
王程莊	西南八里	南街	陳奎莊	東南八里	南街
張齊莊	東南八里	南街	張家莊	正南十里	南街
園裏	西南十二里	南街	官莊	西南十二里	南街
大盤古	正南十二里	南街	小盤古	正南十二里	南街
魏家莊	正南十二里	南街	白家莊	正南十二里	南街
和陸莊	正南十二里	南街	小蘇莊	正南十四里	南街

不抄故也至表列各村間有附入他村一牌應官者自有鄉間習慣與縣府成案在姑不具詳以免詞費表如左

區村表一	中區	附郭
村名	名距城方位里數	舊屬鎮及別稱
本城		舊在城鎮
東馬家橋	正西六里	在城
王牌莊	正西十里	在城
湯家莊	正西十二里	在城
蕭家莊	正西十二里	在城
前胡家店	正西十五里	在城
警莊	正西十五里	在城
西馬家橋	正西六里	在城
孫家莊	正西十里	在城
張廣莊	正西十二里	在城 俗稱張廣王莊
馬家場	正西十二里	在城
東白廟	正西十五里	在城 舊志稱白廟
泗莊	正西十五里	在城
小張莊	正西五里	在城 亦稱張牛營莊

The spatial sources of villages during Ming-Qing period



資料來源：《道光深州直隸州志》，卷首1b-2a

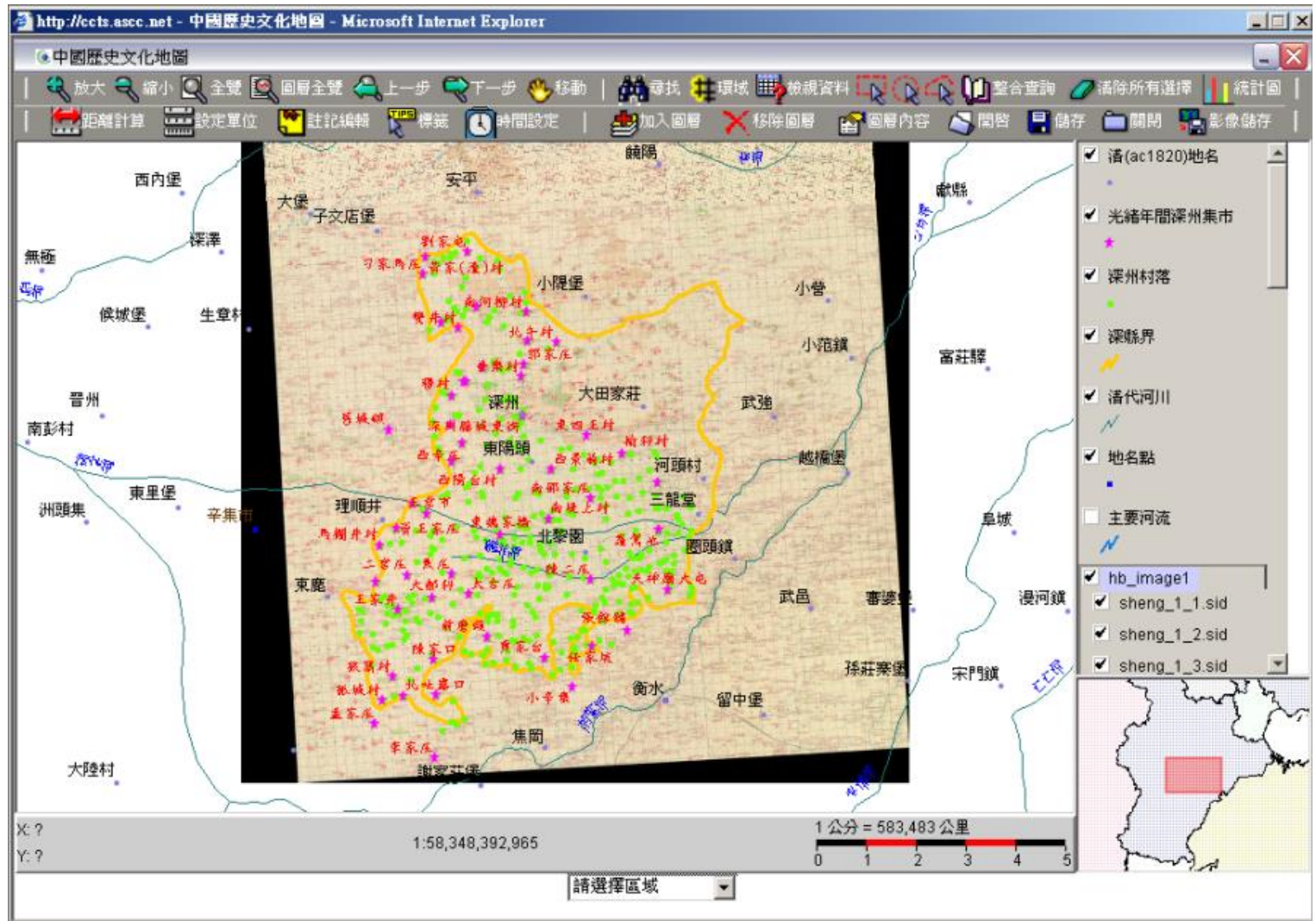
Step I: Georeferencing the early 20th century topographic maps

The screenshot shows a web browser window titled "http://ects.ascsc.net - 中國歷史文化地圖 - Microsoft Internet Explorer". The main content is a GIS application interface for "中國歷史文化地圖". The map displays a georeferenced topographic map of a region in Qing Dynasty China, centered on the area around Qing County (青縣) and Jinan (濟南). The map shows various place names, rivers, and administrative boundaries. A legend on the right side of the map lists several layers:

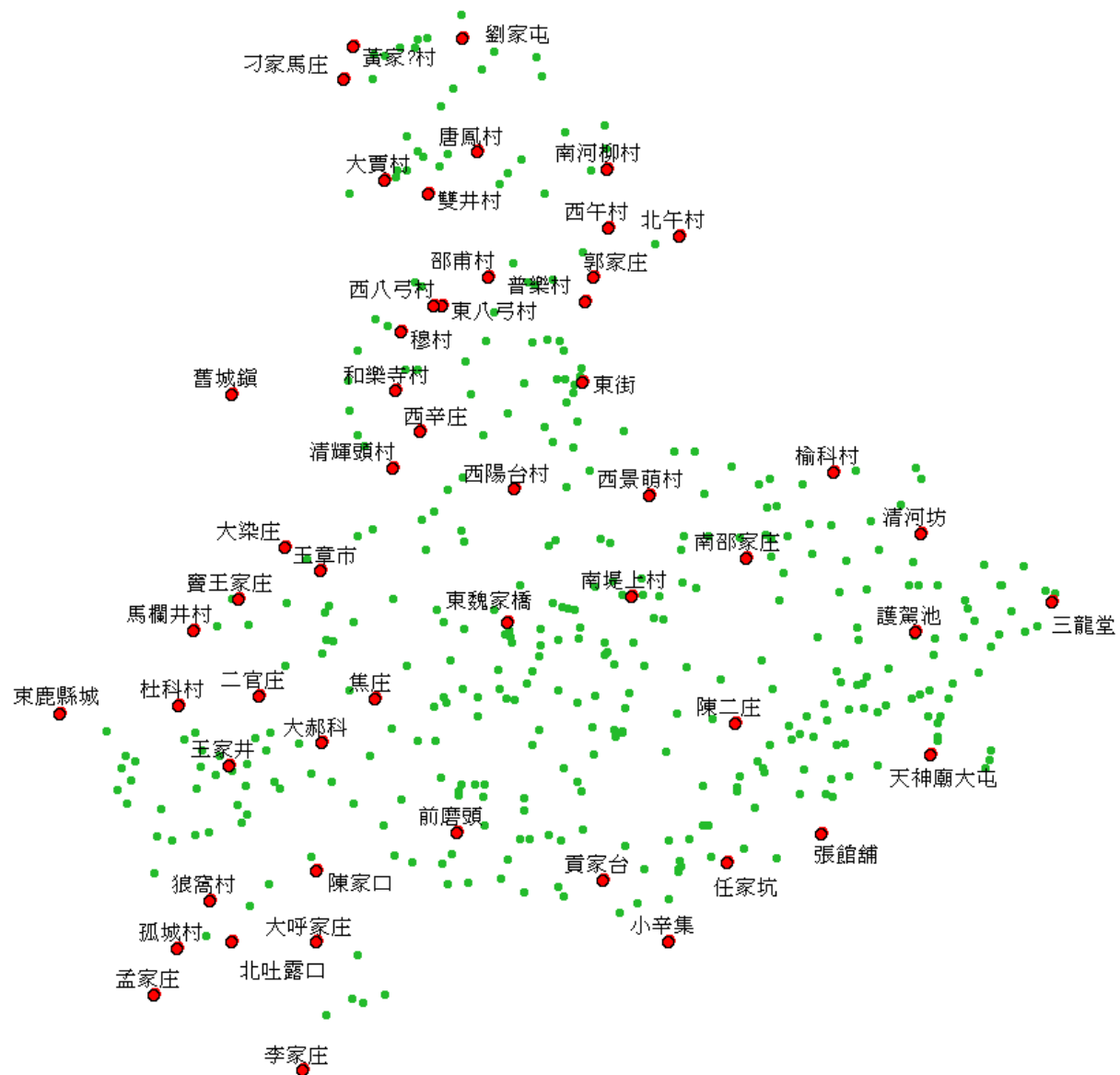
- 青縣集市 (Qing County Market)
- 青縣村落 (Qing County Villages)
- 青縣界 (Qing County Boundary)
- 清(ac1820)地名 (Qing (ac1820) Place Names)
- 清代河川 (Qing Dynasty Rivers)
- 地名點 (Place Name Points)
- hb_image
- ching_1_1.sid
- ching_1_2.sid
- ching_1_3.sid
- ching_2_1.sid

The map also includes a scale bar at the bottom right, indicating a scale of 1:613,151 (1 cm = 6.132 km). The coordinates shown are X: 568,040.655 and Y: 3,260,191.471. A dropdown menu at the bottom center is labeled "請選擇區域" (Please select area).

Step2: Geocoding the name of villages by the gazetteers of CCTS & topographic maps



Mapping the distribution of villages

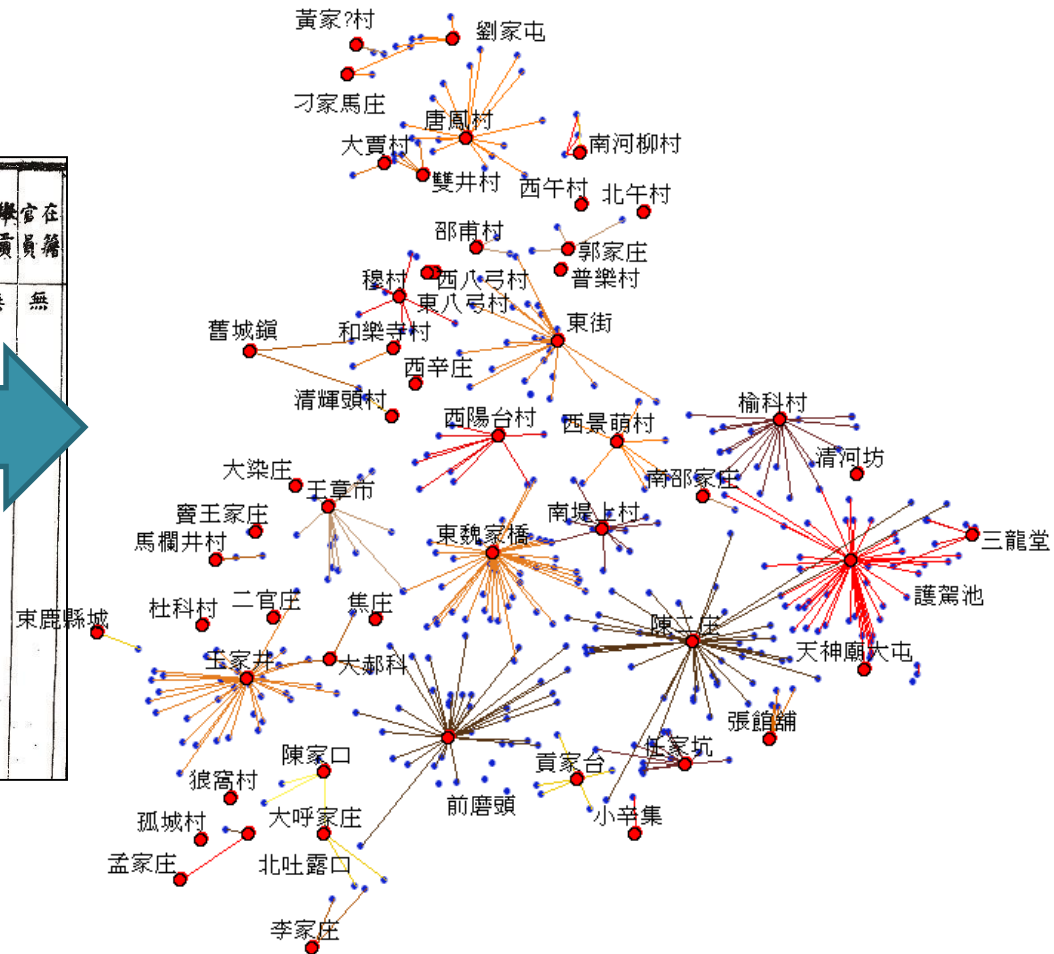
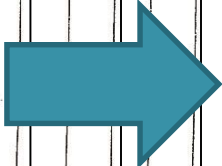


Step3: Identify the market network of villages from the attribute sources

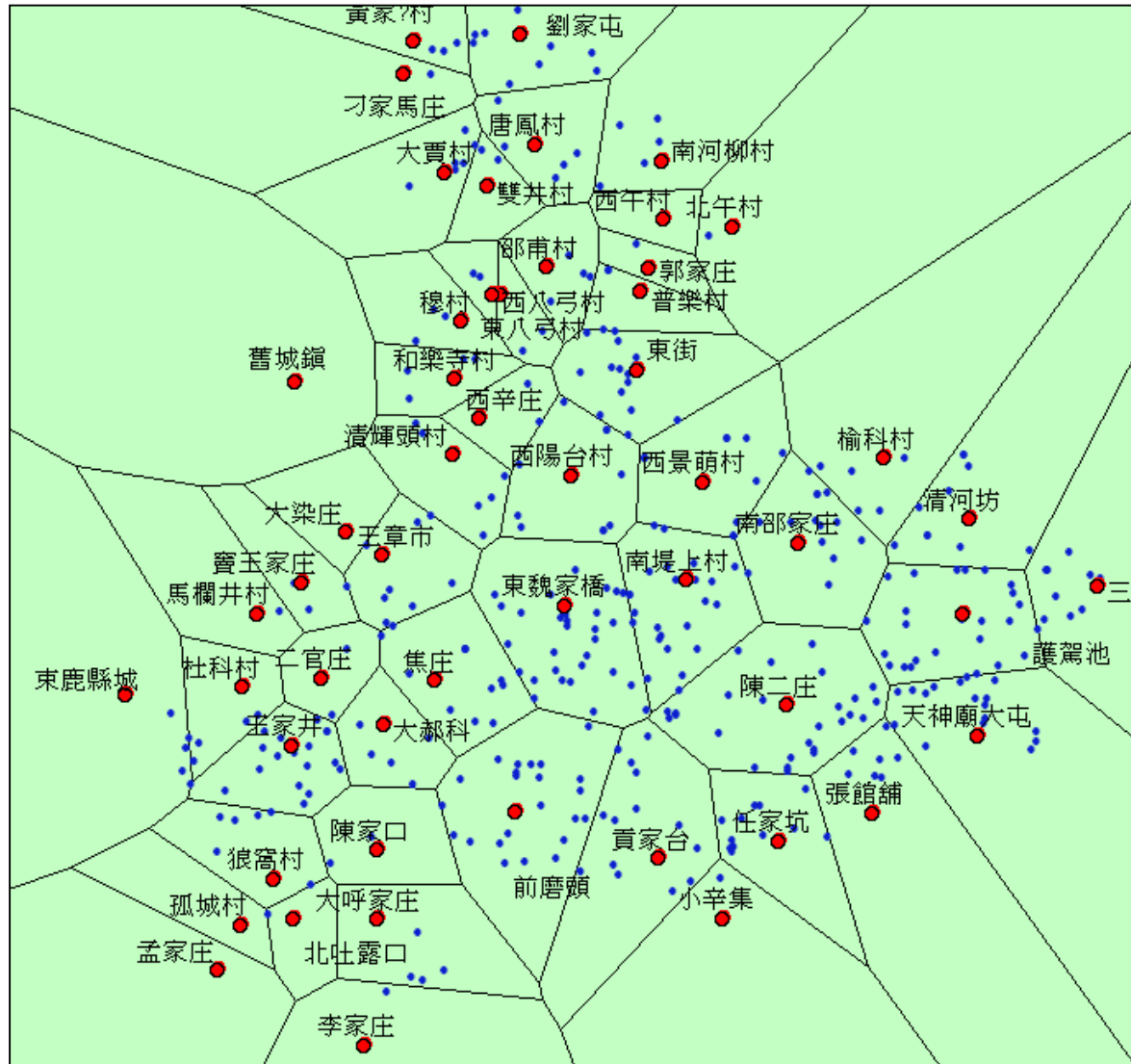
街市	義倉	鄉塾	義學	殘廢	窮民	節孝	耆老	生員	樂貢	官員	在籍
東面道三條 南面道三條	無	無	無	無	無	無	無	無	無	無	無
本村無第... 日... 城... 距本村二十里											

生員	樂貢	官員	在籍
無	無	無	無

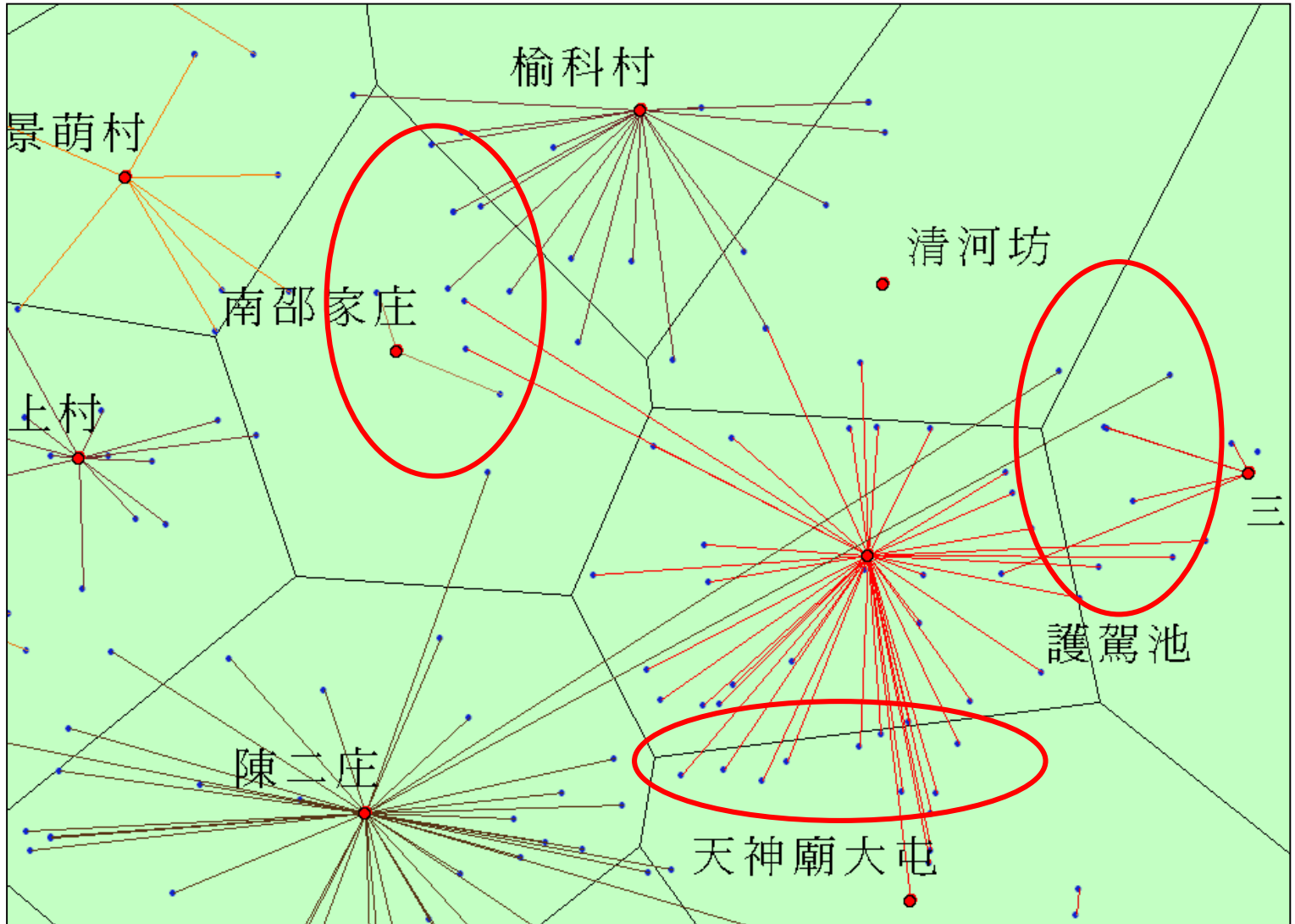
生員	樂貢	官員	在籍
無	無	無	無



Spatial analysis: Thiessen Polygons Method (Central Market Theory)



Finding the relations inside the network

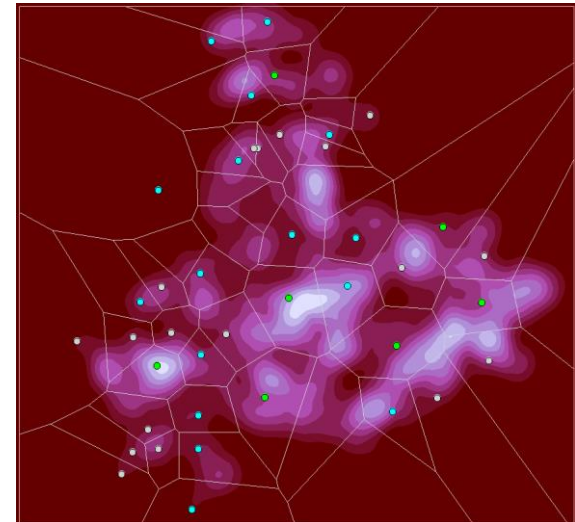
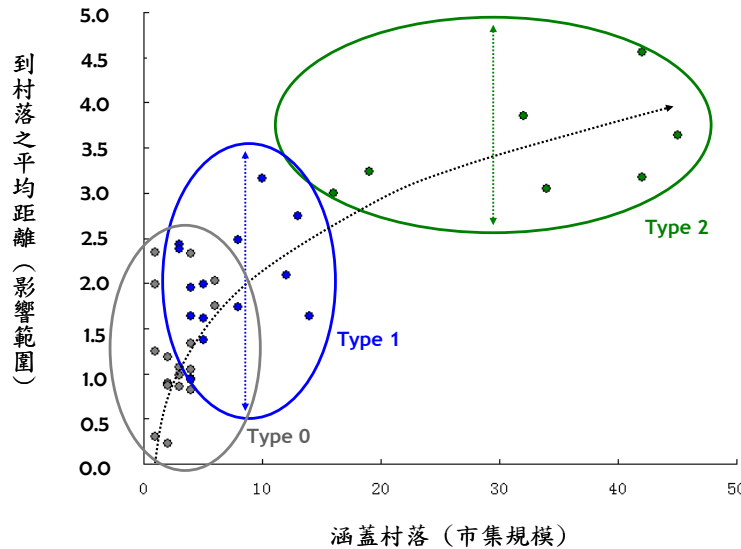
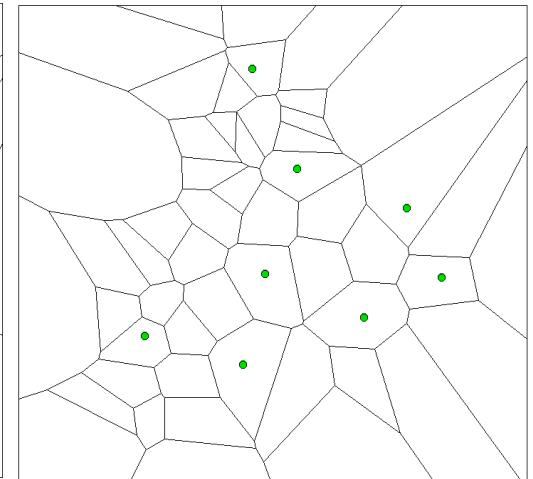
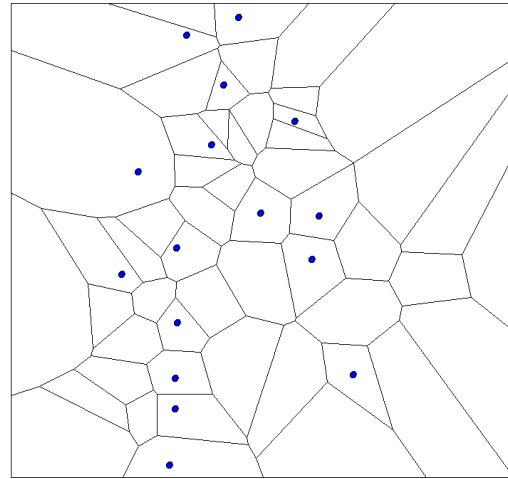
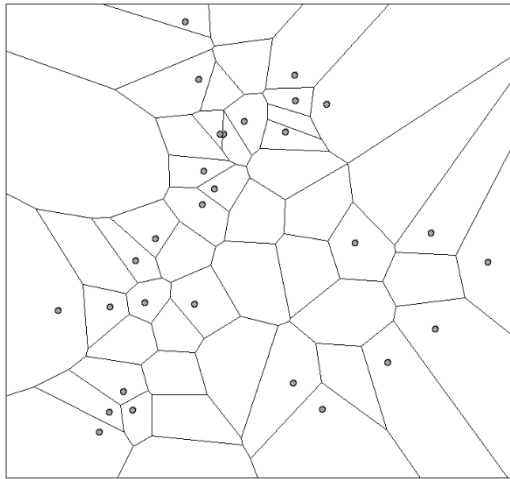


Spatial Distribution of Market Types

● Type 0

● Type 1

● Type 2



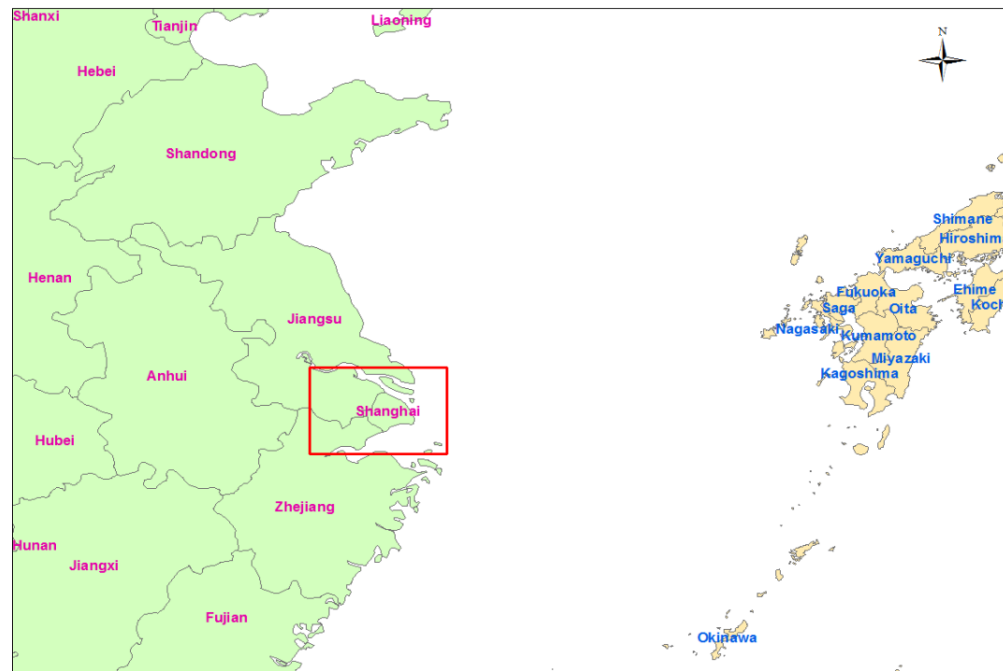
Summary

- **Spatial analysis of communities and market fairs. Social network formed through transport routes.**
- **Scrutiny of interaction between villages and market fairs in Shenzhou, Hebei Province. The more villagers that goes to one market fairs, the larger the scale of commerce activity.**
- **If a market attracts villages further away, means the influential sphere of that market is larger. The analysis of the scale of the market and its spatial relationships can be done through each respective social network formed.**

CASE STUDY 2

Spatio-temporal analysis of Ming-

Qing Jiang-nan(江南)'s Market Towns



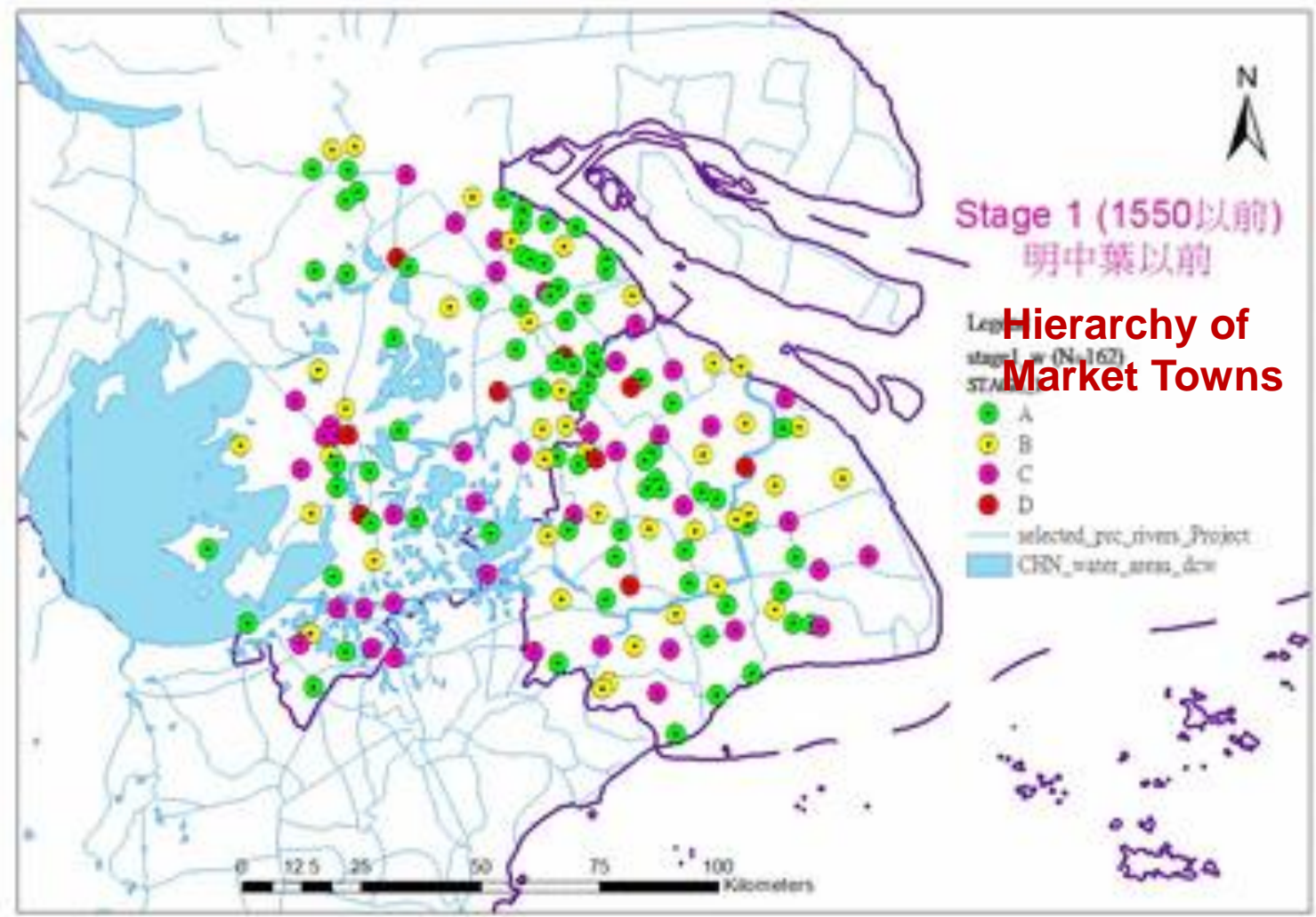
Theory and issues

- Traditional historic town study(Descriptive, Intangible, lack of Spatial Elements) → Current study with **tangible, spatial location, hierarchy**
 - **Walter Christaller** : Central Place (1933)
 - Service Areas (**threshold and range**)
 - **G.William Skinner** : Marketing and Social Structure in Rural China(1964-1965, The Journal of Asian Studies)
 - **Skinnerian Model** in many town's studies
- **This study aims to understanding the change of Service Area in Jiang-nan(江南)'s Market Towns**

The Number of Market Towns in 6 Stages (From 1550 to 1949-)

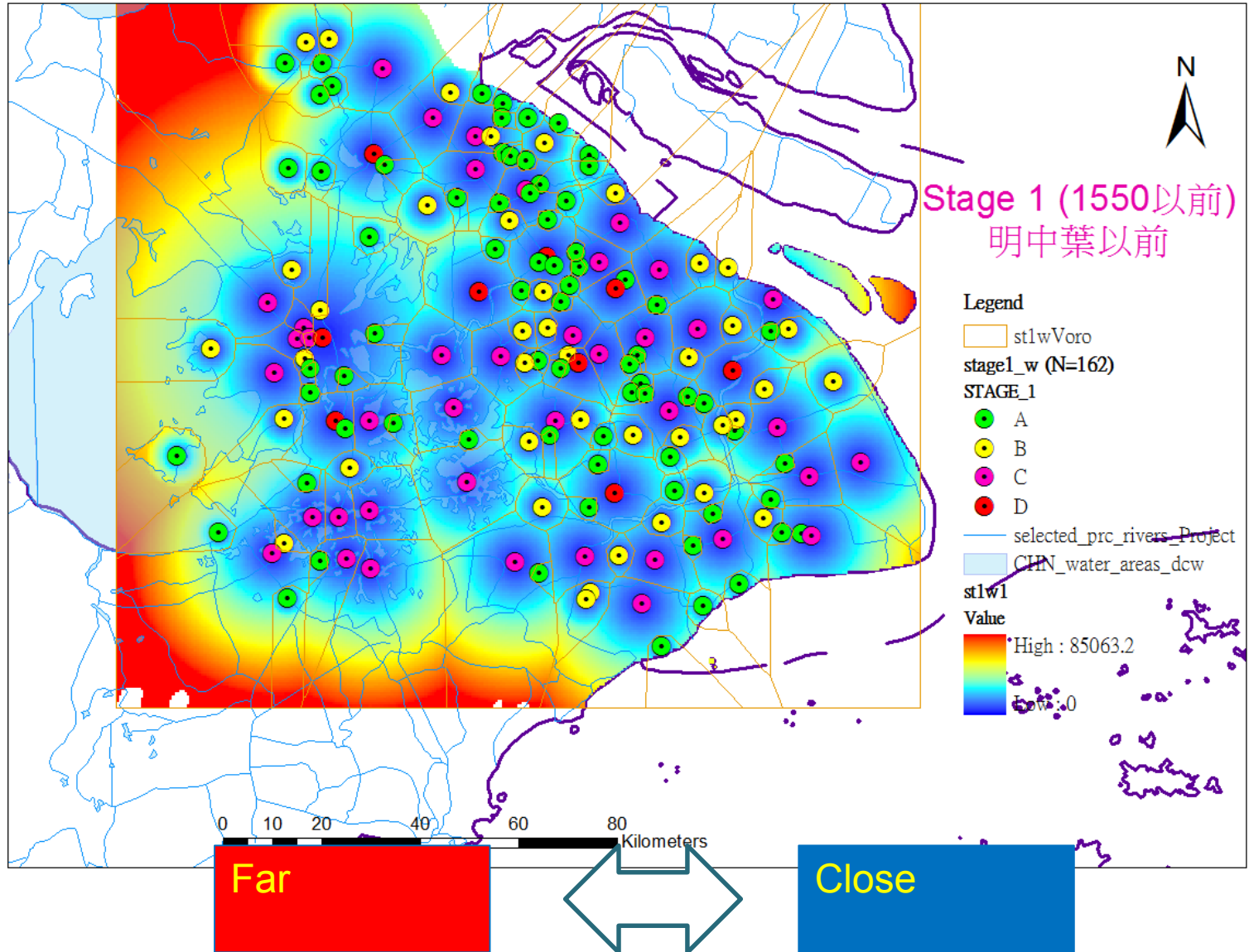
County	Before Mid-Ming (~1550)	Late Ming Early Qing (1551-1722)	Mid Qing (1723-1861)	Late Qing (1862-1911)	R.O.C (1912-1949)	1949-
Chungso	24	43	46	85	84	74
Wu	18	21	26	58	68	54
Wujiang	16	15	17	20	21	32
Kunshan	7	14	19	30	29	22
Taicang	20	26	25	29	33	32
Chading	12	20	22	25	29	38
Boshan	5	9	12	17	19	18
Chingpu	15	30	30	42	48	48
Shanhi	12	26	27	52	70	74
Nanhwei	6	13	33	61	70	76
Chuansha	1	1	5	9	25	24
Fenhsien	8	14	23	61	43	37
Sunchian	10	20	33	51	58	53
Chinshan	7	9	16	93	38	38
Total	161	261	334	633	635	620

Growth and Decline of Market Towns in 6 stages (animation)



Raster Format (Service Area, Distance)

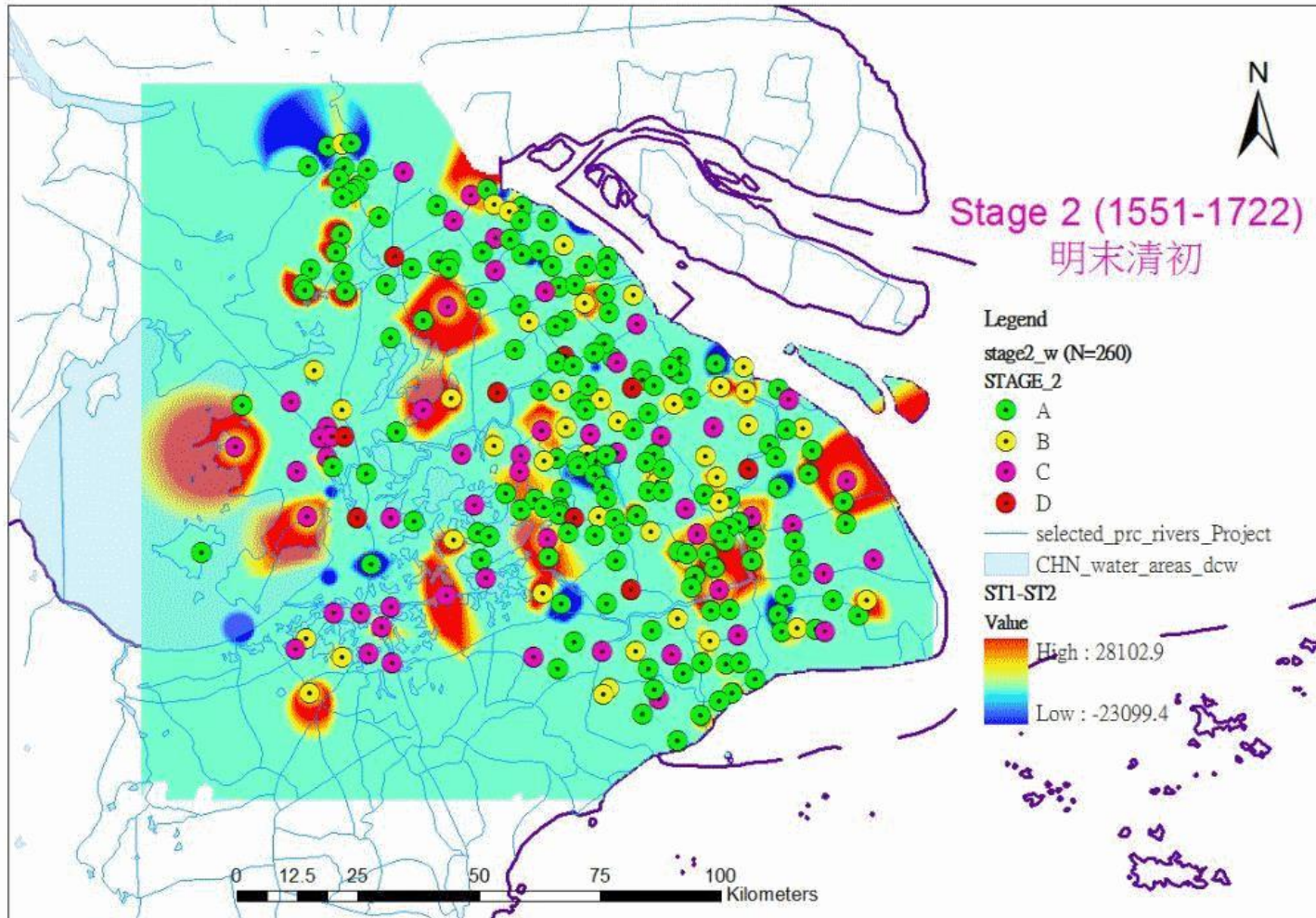
Converted by “Weighted Voronoi Raster” method



The Change of Service Area (animation)

Red : Growth

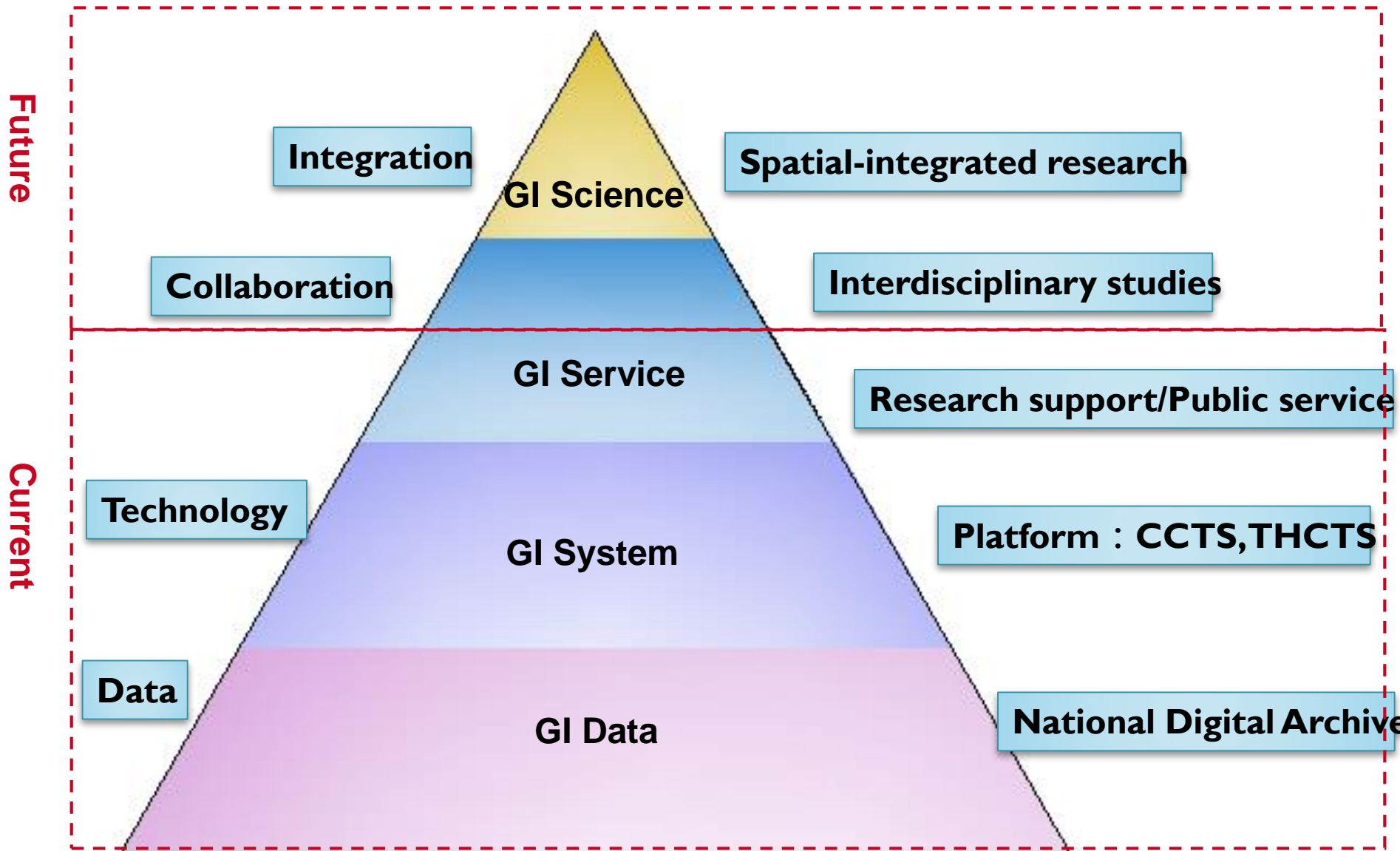
Deep Blue : Decline



Summary

- With the proposed “**Weighted Voronoi Raster**” method, **the growth and decline of market towns are easily identified.**
- **Economic rationality** is important to explain the service area.
- **Clustering among the hierarchy towns.** (not only visualization, but also statistical test)-Urban agglomeration

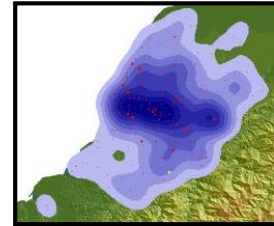
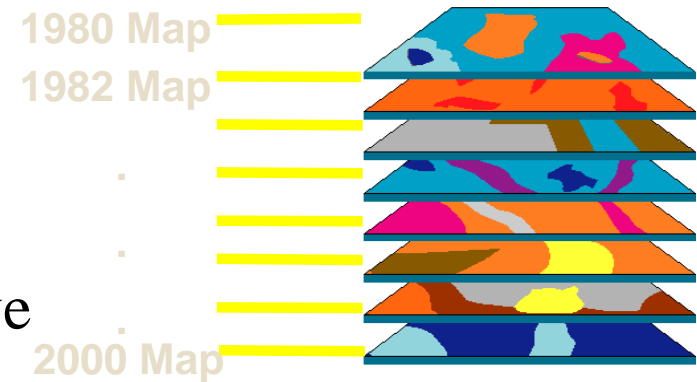
Past, Present and Future of Historical GIS



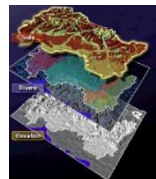
Prospects

- **Interdisciplinary integration**
- Integrating qualitative and quantitative researches in natural sciences, social sciences, and humanities
- Integration of knowledge on technology and humanities

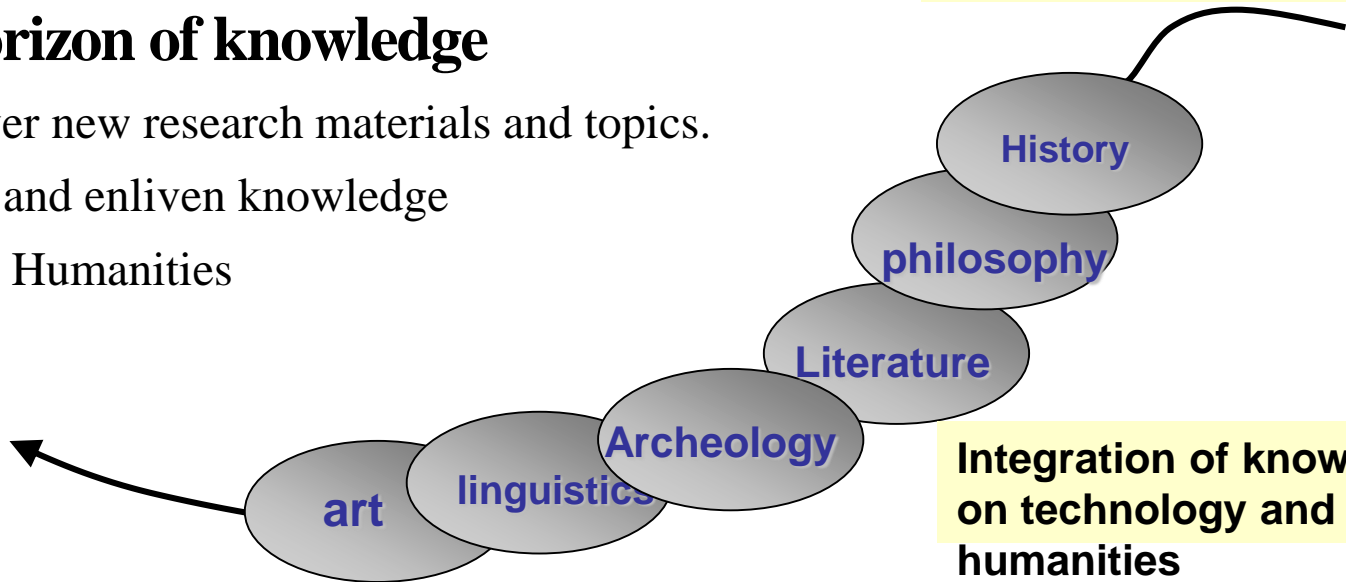
- **New horizon of knowledge**
 - Discover new research materials and topics.
 - Create and enliven knowledge
 - Digital Humanities



Create and enliven knowledge



GIS



Integration of knowledge on technology and humanities