Conservation of Historical and Cultural Towns and Villages in China

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Abstract: Historical and cultural towns and villages (HCTVs) in China home to a large variety of fascinating tangible heritage, intangible heritage and natural landscapes. These legacies characterised from ancient history, architecture, society, humanity, aesthetics, philosophy and folk custom, are significantly undervalued. The conservation and protection strategies are conventionally understood as nominal rather than substantial. And even some hot-button issues remain off limits. In this article, the knowledge map case study provides a unique opportunity to data mining and cluster analysis precisely bibliographic references from 1995 to 2015, and scrutinize the research front. We address critical review on selected pressing issues that resides potential burgeoning territories, and the perspective of methodological considerations would be also envisaged and discussed.

Key words: China, historical and cultural towns and villages (HCTVs), tangible heritage, intangible heritage, natural landscape

Introduction

China is a country of exceptional diversity and the most populous country with a population of over 1.3397 billion\(^1\) increased from 1.2375 billion\(^2\) in 1995, and China has a long, rich history with an almost unbroken cultural tradition extending back to some 5,000 years ago. Its cultural and natural heritage sites record the formation and development of the Chinese people. The most fascinating feature of China consists of its very diverse rural areas with their individual traditions, ways of life, and working methods to the links uniting us all in processes of exchange and dialogue. In 1885, an urgent appeal James B. Angell made for “a thorough investigation of existing usages and laws in towns and villages of China”\[^3\] [2]. For"..."

\[^1\] According to “Communiqué of the National Bureau of Statistics of People’s Republic of China”, which released by National Bureau of Statistics of China on 28 April, 2011, the total population of mainland China reached 1.3397 billion in 2010. Some argued that the household registration system and other survey data collected by various government agencies and academic institutions provide information of varied coverage and quality, although the national population census is the most reliable source of demographic data [1], [58].


\[^3\] “A profound knowledge of the Chinese language, exhaustless patience in ransacking the voluminous literature of China, and a thorough investigation of existing usages and laws in towns and villages of China, will be necessary for the successful prosecution of such work. But the facilities for mastering the language are now so great, and the opportunities for coming into close contact with Chinese life and thought are so rapidly increasing, that the younger scholars need not despair of accomplishing what has hitherto been impossible; but what may prove a most valuable contribution to the history of institutions.” [2]

Historical and Cultural Towns and Villages (HCTVs)\[^4\], one of the most significant aspects is their intense interaction with their environment, which has resulted in the reshaping of very diverse and fascinating cultural landscapes. However, the outstanding cultural and natural legacy and a long tradition of conservation and restoration practices in HCTVs are poorly understood yet\[^5\].

The year 2015 marks the 70th anniversary since UNESCO was founded in 1945 to develop the “intellectual and moral solidarity of mankind” as a means of building lasting peace. At the turn of 2015, nurturing and safeguarding of the status quo of the distinctive cultural forms of the HCTVs in China, as well as the processes of their production, has emerged as a key concern for professionals at home and abroad. Therefore, the essential challenges would be to propose a coherent perspectives opened up by reflection on HCTVs and their intrinsic values. Those challenges identify a main thread among the wide range of possible interpretations, and thereby clarify how they can become beneficial to the action of the international community. That is the essential purpose of the present methodological considerations and arguments.

\[^4\] According to Article 14 of the Law of the People’s Republic of China on Protection of Cultural Relics (2015 Amendment) adopted at the 14th session of the Standing Committee of the 12th National People’s Congress on 24 April, 2015, HCTVs are defined as “towns, neighbourhoods or villages with an unusual revolutionary memorial significance”.

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1. China’s villages: beyond the research front

What’s scientific research front in the progressive knowledge domain of China’s towns and villages? There are several key questions should be addressed by this case study. What’s the latest research front on China’s towns and villages? How did the research front evolve over the last two decades? What are the hottest research-front terms? Which papers are associated with these terms?

1.1 Modeling: Knowledge Domain Visualization

The pattern of bibliographic references indicates the nature of the scientific research front [4]. Spatio-temporal dynamics are identified in terms of the most active topical areas and cited references via scientometrics [5]. Latest developments are identified in terms of newly emerged clusters and knowledge domains [6]. The primary goal of knowledge domain visualization (KDViz) is to detect and monitor undescribed evolution of the knowledge domain of China’s towns and villages.

The central idea of KDViz is to calculated co-citation counts within each time-sliced segment and then merge adjacent networks into resultant networks. Co-citation metrics could be normalized as cosine coefficients [7]. Suppose two documents respectively are \( D_i (1 \leq n) \) and \( D_j (1 \leq n, i \neq j) \), then the cosine coefficients can be defined as follows,

\[
CC_{ij} = \frac{C_i}{\text{SQRT}(C_i \times C_j)}
\]

Where \( C_i \) and \( C_j \) represent the citation counts of \( D_i \) and \( D_j \), respectively. \( C_0 \) represents the co-citation count between \( D_i \) and \( D_j \). Obviously, \( C_0 \leq \text{Min}(C_i, C_j), 0 \leq CC_{ij} \leq 1 \). When \( C_0 = C_i = C_j, C_0 = 1 \), while when \( C_0 = 0, CC_{ij} = 0 \). In CiteSpace, Cosine, Dice, and Jaccard similarity coefficients are available to measure link similarity. Kamada and Kawai’s algorithm is used in normalized mapping procedure [8]. Although more efficient meta-ranking algorithms [9] and visualization mapping and clustering algorithms [10] are potential candidates in KDViz, the topic is beyond the scope of this article.

1.2 Knowledge Map Study: from 1995 to 2015

In 1965, Derek J. de Solla Price firstly coined the item “research front”, which represents the state-of-the-art thinking of a research field [4]. It is generally known that scientific literatures are characterized by two distinct citation half-lives of papers: classic papers with persistently high citations and transient ones with their citations peaked within a short period of time. To characterize the transient nature of the research field — China’s towns and villages, CiteSpace [3] is used to detect transient patterns of bibliographic references in the past 20 years, visualize emerging trends, and demonstrate a true nature picture of the above target domain (hereafter this text will be abbreviated as 20-year Knowledge Map Study).

In KDViz, the input data for CiteSpace III (version 3.9, R6 64-bit) were retrieved from citation index databases via the Web of Science based on a topic search for articles published between 1995 and 2015 on China’s towns and villages. The scope of the search included four topic fields in each bibliographic record: author, title, source, and abstract. The search was limited to articles (include book reviews) in English only. Networks of co-cited references representing literatures are constructed and visualized based on the resultant dataset of 2,441 hits, which matched our query of the 34,304,420 records retrieved in the Web of Science. The 20-year time span between 1995 and 2015 was divided into eleven 2-year time slices, and top 60 most-cited or occurred items from each slice was selected for later analysis. Three sets of threshold levels, namely citation frequency threshold \( t_c \), co-citation frequency threshold \( t_{cc} \), and co-citation coefficient threshold \( t_{cc} \), were set as follows: (4, 4, 20), (4, 4, 20), and (4, 4, 20), and hereby \( \text{cosine} \geq 0.15 \).

Figure 1 shows an overview visualization and panoramic image by cluster analysis with 2,422 bibliographic records over weight threshold, pivotal 510 nodes and 121 clusters. Visually salient nodes and clusters indicate that top-10 active research fields notably introduced by archaeologists, environmentalists, economists, parasitologists, anthropologists, demographers, ecologists, sociologists, zoologists and agriculturists.

Figure 2 shows a timeline view of 121-cluster hybrid network of cited articles (intellectual bases) and citing terms (research fronts) on China’s towns and villages based on eleven 2-year slices. The emerging trends involved in bibliographic references from 1890 to 2014, with several ‘gaps’. Early in 1890, the first pivotal-point research stems from an English entomologist Peter Cameron (1847-1912) who contributes to a knowledge of the Hymenoptera Orientalis [5] of the oriental zoological region identified by Figure 2 [11]. The ‘gaps’ emerges at about from 1890 to 1938, from 1940 to 1954, and from 1966 to 1976 [10] respectively. In fact, cultural and natural heritage conservation had a troubled history in Maoist China (1949-1978). Although the Chinese Ministry of Culture of the PRC paid great attention to archaeology and cultural relics work in the 1950s and early 1960s, outside these fiefs neglect was often the kindest fate an ancient monument could be accorded. The governments waged an active onslaught against temples, walls and other ancient monuments as the physical embodiment of a denigrated feudal past. The depredations of ‘the Cultural

[5] The Hymenoptera are the third largest orders of insects, comprising the sawflies, wasps, bees and ants. Over 150,000 species are recognized, with many more remaining to be described.

[6] The opportunity to research during period of the Great Proletarian Cultural Revolution (known as “the Cultural Revolution”), was a social-political movement that took place in the People's Republic of China from May 1966 until October 1976. Scientific activity “has had little chance to take hold” during such “political turmoil” [59].
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Revolution’ deeply affected all of those who, in the late 1970s and 1980s, sought to salvage what remained in its wake \[12\].

The Zhongguo Yingzao Xueshe (Chinese Architectural Society, 1930-1946), named for the Song dynasty treatise on ancient architecture titled Yingzao Fashi, was a group of intellectuals devoted to the study, documentation and preservation of ancient Chinese architecture. This society and many of the impressive elderly generation of conservators and researchers characterised the Republican period (the 1950s and the early 1960s). Liang Sicheng\[7\] (1901-1972) is recognized as the “Father of Modern Chinese Architecture”, and the author of China’s first modern history on Chinese architecture and founder of the Architecture Department of Northeastern University in 1928 and Tsinghua University in 1946. The influence of Liang Sicheng on the development of conservation practice in China beginning in the 1930s have been investigated \[14\]. He was the Chinese representative on the Design Board which designed the United Nations headquarters in New York. He discovered and analysed the first and second oldest timber structures still standing in China, located at Nanchan Temple and Foguang Temple at Mount Wutai. Luo Zhewen\[8\], a student of Liang Sicheng, is one of China’s leading scholars of ancient architecture, especially that of the Great Wall. He is also one of the initiators and rapporteurs of the Declaration of Qufu\[9\], which is one of the most important guidance documents for cultural and natural heritage conservation practices in China. Several foreign scholars, including the art historian Wilma Fairbank who conducted pioneering fieldwork at the Wu Liang Shrine in Shandong, were also involved with the Chinese Architectural Society. Later, in tandem with the development and application of the nation and localized basic principles in China, scholars from various disciplines to address the ways in which cultural and natural heritage has been invented, valued, and managed in late imperial, modern, and contemporary China. Development of case studies of sites in China and research and writing on conservation practice in China and its relation to Western practices continues.

On the whole, the top-20 keywords demonstrates the hottest research front in the past two decades. After twisting the further abundant information from the term nodes from Figure 2 manually and carefully, we recognize that several active topics involved in as following: township-village enterprise (TVEs) (enterprise, provider’s opinion, contract service, and etc.), health and epidemiological survey (schistosomiasis, arsenic, selenium, cataract surgery, controlled trial, and etc.), rural economic system \[10\] (economic development, growth, and etc.), peasant-worker (rural settlement, rural youth, adult women, Philippine, and etc.), chengzhongcun (chengzhongcun, distinct urban space, and etc.), and environmental archaeology research (Devonian, hymenoptera, dongting lake region, and etc.). As a case in point, TVEs that previously "Commune and Brigade Enterprises" dating from the Great Leap Forward of 1958 to 1961 had served the rural areas. Since the State Council of the PRC first officially used the term "TVEs" in March, 1984 \[11\], there is a resurgence of interest in this active field and further investigations have been carried out by scientists at home and abroad in this scenario \[15\]. Subsequently, recent advances in tentative mechanisms of TVEs have opened a burgeoning subjects, especially in comparative economics domain \[17\].

Figure 3 shows a timezone view of 121-cluster hybrid network of cited articles and citing terms on China’s towns and villages based on eleven 2-year slices. Based on Figure 2, Figure 3 further demonstrates the emerging trends involved in bibliographic references from 1995 to 2015. The top-5 keywords uncovers the hottest research front in the past two decades as following: schistosoma japonicum infection, China’s township, urban village (refers to Chengzhongcun in Figure 2), and village enterprise \[12\]. China’s township, urban village, and village enterprise, as the accompaniments with the rise of the urban territorialisation of rural areas and the geographic distribution of the Chinese population reshaped by an unprecedented rural-to-urban migration, draw public attention spontaneously \[1\].

Figure 4 shows a geographic map of co-author networks from 1995 to 2015 generated by Google Earth, where white lines connecting co-authors in their locations. We may choose to view

\[7\] To cite Princeton University, which awarded Liang Sicheng an honorary doctoral degree in 1947, he was “a creative architect who has also been a teacher of architectural history, a pioneer in historical research and exploration in Chinese architecture and planning, and a leader in the restoration and preservation of the priceless monuments of his country.”

\[8\] Luo Zhewen (1924-2012), a famous expert on cultural relics and ancient building, who is better known for his championing of the Great Wall of China and the Grand Canal as World Heritage Sites.


\[10\] China is home to about 20 per cent of the world’s population, with possesses only about 7 per cent of the earth’s arable land, with only 15 per cent of its own territory being arable. And cultivated land continues to decrease every year because of salinization, soil erosion, deforestation, and conversion of land from agricultural to urban use. To use their resources as effectively as possible, architecture and life in the rural villages has also been shaped by these factors.


\[12\] The term “People’s Republic” in Figure 3 means “People’s Republic of China”, which can be ignored technologically here.
co-author relations found in any specific year. Here, the density of lines is proportional to the collaborative strength between co-authors from their locations in the static map. In this study, the intensive cooperation between authors in the field of China’s towns and villages mainly comes from China, USA, England, Australia, Japan, Canada, Germany, Netherlands, Switzerland, and France (Top-10 Countries) in the past 20 years. As a case in point, over past decades native professionals jointed with overseas counterparts have carried out a series of health and epidemiological survey, which had a positive effect on a massive scaling up of malaria prevention and treatment in China. According to the 2014 World Malaria Report by the WHO[13], malaria mortality rates declined by 47% worldwide and particularly impressive achieved >75% decrease in case incidence in 2013 in China. While the major plasmodium species of parasites is P. falciparum (73%), P. vivax (23%), China reported just nine indigenous cases of P. falciparum malaria in 2013 and 71 of P. vivax and is aiming to eliminate malaria nationally by 2020. Figure 5 shows how malaria mortality rates have changed since 2000. Partly, those joint research created a favourable impetus that contributed to the public hygiene movement in China that resulted in a sharp drop in mortality from infectious diseases in the past decades[1][23].

1.3 What’s the research front?

The use of CiteSpace III provides a unique opportunity to data mining and cluster analysis precisely the number of bibliographic references, and identifies the research front on China’s towns and villages. It also help us to scrutinize pivotal bibliographic references, evaluate potential virgin territories on a relative level, and the perspective of methodological considerations would be envisaged. The object of study in intensive research is ‘urban’ rather than ‘rural’. In most literatures, as a vague concept, the notion of ‘rural area’ refers to an area outside of cities and towns, and are used most frequently. Unfortunately, there is no notable literatures specialized in the field of conservation of cultural and natural heritage on HCTVs in China recognized in this study yet.

Until recently, the following domains in the field of China’s towns and villages seek to understand and the underlying mechanisms should be uncovered:

(1) Policy non-transparency [24], and effectiveness of law enforcement are long-standing problems but still uncultivated territory. The statutory documents on HCTVs adopted by international organizations and Chinese authorities, must affirm basic principles, strengthen assessment, improve enforcement, and enhance governance.

(2) The hierarchical structure of the administrative divisions of PRC and its efficiency is poorly understood yet [25][27].

HCTVs in China almost governed by counties, as a critical joint in the complicated administrative structure, their efficiency should be clearly demystified and contextualized.

(3) Most literatures focus on microscopic qualitative analysis on specific case study rather than macroscopic and comprehensive quantitative analysis the whole nation. And most of those case studies always focus on settlements of Han population in eastern or western regions rather than those in central regions and other minorities’ settlements. Most literatures attached the more importance to tangible culture than intangible culture and natural landscape [29].

(4) As the legacy keepers of HCTVs, locals’ living conditions (including the rich-poor gap, self-sufficiency abilities, land use, urbanization impacts, diverse climate, education level, dynamic environmental reciprocity, biodiversity, and so on) need to be given enough attention and reassessed [29]. The inhabitants in HCTVs should be encouraged to enjoy and nourish those legacy voluntarily.

(5) The quintessence extracted from ancient history, architecture, society, humanity, aesthetics, philosophy, and folk custom reflected from tangible and intangible culture in HCTVs, are significantly undervalued [29].

There are still puzzling rings with no beginning and no ending in the fields motioned above and some hot-button issues remain off limits (Bloom et al. 2008, Normile 2008, Glaeser 2011, Peng 2011, Yang 2013, Bai et al. 2014). Actually, the 20-year Knowledge Map Study reveals a proposed multidimensional model of research domains that reside rich ore. It is impossible to cover all those pressing issues in this article, therefore, only a few are selected for later discussion.

2. Conservation and Restoration of HCTVs: Challenges and Opportunities

From the above 20-year Knowledge Map Study, while the Chinese Cultural Revolution devastated Chinese cultural and natural heritage and resulted in the destruction of many significant sites, domestic scholars resurgd with passion to contribute to related fields broadly since 1980s. With revitalization of China’s cultural and natural heritage conservation, there has been a new emphasis on the identification and understanding of local traditions.

On October 8, 2003, the Ministry of Housing and Urban-Rural Development (MOHURD) and the State Administration of Cultural Heritage (SACH) jointly announced the first list of National Historical and Cultural Towns and Villages (NHCTVs). This action is said to be an important milestone of unveiling the protection of HCTVs in a positive and transformative way. As an indispensable and important component of historic and cultural and natural heritages of China, HCTVs have preserved a great number of complete ancient streets and buildings, also inherited abundant precious historic [13] World Malaria Report 2014. http://apps.who.int/iris/bitstream/10665/144852/2/9789241564830_eng.pdf.
intangible heritages are not only indicators of Chinese glory, national cohesion. The 'living heritages' - tangible and intangible resources, identity recognition and patriotism passion, and enhancing national cohesion. The 'living heritages' - tangible and intangible heritages are not only indicators of Chinese glory, ancient history, but also the common wealth of all human.

Since joined the International Convention Concerning the Protection of World Cultural and Natural Heritage in 1985, China has 47 world heritage sites to date, ranking second in the world only running after Italy; of these 33 are cultural heritage sites, ten are natural heritage sites, and four are cultural and natural (mixed) sites. Since 2004, China has made the first large-scale renovations on seven world cultural heritage sites in Beijing - the Ming Tombs, the Great Wall, the Forbidden City, the Temple of Heaven, the Summer Palace, the Grand Canal, and the 'Peking Man' site at Zhoukoudian, all of which are planned for completion before 2008. In addition, China has a rich non-material cultural and natural heritage, with several of them inscribed on UNESCO's list of Masterpieces of the Oral and Intangible Heritage of Humanity. From 'Ancient City of Ping Yao' (1997) to 'Old Town of Lijiang' (1997), as well as from 'Ancient Villages in Southern Anhui - Xidi and Hongcun' (2000) to 'Kaiping Diaolou and Villages' (2007), more and more HCTVs features the World Heritage List (WHL). Nowadays, it is worth mentioning that those conservation and restoration experiences on world heritage sites also set up best practice paradigms for other HCTVs.

As shown in Figures 6 and 7, the 528 NHCTVs are widely distributed in China. Notably, the 528 NHCTVs and the 47 world heritage sites are mostly distributed in the following provinces: Jiangsu, Zhejiang, Anhui, Jiangxi, Guangdong, Guizhou, Sichuan, Chongqing, Shanxi, Gansu, Hebei, Henan, Hubei, Hunan, Fujian and Yunnan (as shown in Figure 6, 7, 9). It is not hard to find that NHCTVs are closely related to the above world heritage sites. In other words, the more NHCTVs agminate regions tend to be much more world-class heritage sites.

Besides, whatever history, architecture, society, humanity, aesthetics, philosophy, and folk custom reflected from tangible and intangible culture, share with us huge and precious thinking and knowledge repository. As a case in point, the two traditional villages of Xidi and Hongcun have exercised great influence in a number of fields, including architecture, environment, industrial design, aesthetics, and literature. Their overall planning, architectural style, and landscape design provide admirable models for the construction of human settlements. The profound historical experience of water system, its living environment and ecological awareness as well as its practical values such as washing, fire prevention, irrigation, ornamentation, and so on. Zhang Da roughly reviewed on the protection of water environment in HCTVs [30]. In fact, those wisdoms would open and enlighten contemporary spatial structure, street design, channels and plumbing system, vernacular dwellings, as well as environmental philosophy for both urban and rural settlements.

Last but not least, it is of vital significance to improving the popularity of best practice paradigms all over in China, implementing protection agenda and formulation, and promoting and booming cultural and natural heritage tourism undoubtedly [31] [32]. In 2012, the tourism industry directly accounted for nearly 4% of GDP, and China National Tourism Administration (CNTA) expects this to reach 4.5% in 2015 [33]. The authentic and well preserved historical character of those HCTVs have attracted considerable attention from historians, architects, artists, as well as visitors. Certainly, it’s worth noting that too much visitors can degrade the regional community. This situation can result in over-depletion of the historic property and assets.

However, since some HCTVs showing hard-won improvements and others demonstrating an appalling lack of momentum, the protection strategies of HCTVs always make us fluctuate between hopes and fears.

3. The looming crisis: Challenges and Opportunities

China’s unbalanced urbanization strategy is leading to excessive growth of mega-cities while ignoring the country’s small cities, towns, and villages, which remain small, impoverished, and poorly developed [34]. The level of urbanization in China before the 1980s was quite low, and it increased very slowly over time [1]. However, China's urbanization increased from 30.96% to 54.41% between 1995 and 2014 (Figure 8), but that figure does not include migrant workers registered as residing in rural areas. By 2020, some 60% of the population will live in cities, according to government estimates. Unfortunately, China’s urbanization has developed far ahead of its economic growth. As a consequence, China’s urban economic advantages are being offset by the perennial overcrowding urban, air and water pollution, environmental degradation, increased uncultivated land, rural hollowing, and severe labour shortage in its rural communities (Bloom et al.
Regional executives often rhapsodize about the appetite for rich heritage in HCTVs, since they are beautiful business cards and brand image prolocutors of cities. But there is a consensus that the historical and cultural heritage in HCTVs will continue to decrease. The priority of rapid economic development in China may be one of the decisive factors, but not the only determine answer to these questions. The underlying mechanisms is conventionally understood as nominal rather than substantial.

3.1 Diversity Dilemmas: The Needs for Research and Development

Although the scope of heritage, in general, is now agreed internationally to include ‘tangible’ and ‘intangible’ as well as ‘environments’, the finer terminology of ‘heritage’ has not been streamlined or standardized, and thus no uniformity exists between countries [39]. There are 528 NHCTVs, thousands of HCTVs authorized by local governments, and some world heritage sites in those HCTVs to date (as shown in Figure 6, 7, 9). They are all featured by very diverse fascinating tangible heritage, intangible heritage and natural landscapes. This variety constitutes one of the difficulties of their protection, but it also makes their preservation all the more important. The preservation of variety in a civilization is one of the core issues of protection agenda.

Cultural landscapes in HCTVs might be more prone to be disregarded than tangible and intangible heritage comparatively. For example, urban planners seem to treat nature as if it does not exist. The growing pressure on the scarce and precious water resource is severely undermining natural hydrological regimes and further endangering the environment in urban and rural regions (Lu and Ran 2011). The disappearance of cultural landscapes will also have an impact on the biodiversity in the region. Especially in regions where the cultivation of land is very difficult, the people have had to develop specialised techniques to adapt to the local agro-ecological conditions [34]–[36]. Their practical knowledge and efforts to secure ecological stability and avoid erosion in order to ensure sustainable cultivation of the available land is crucial to the preservation of the local ecosystems and the diversity of cultivated plants. Only through their work in the individual ecological habitats could they become familiar with the differences in the demands, the flexibility, and the reactions of the cultivated plants.

The Chinese Premier has declared “war on pollution”, and China formally began implementing its revised Environmental Protection Law (EPL) on 1 January 2015 [37]. The new EPL provides weapons for this war, but their effectiveness will depend on enforcement, particularly in China’s developing rural regions. In fact, application of environmental laws in rural, less developed areas has been much weaker than in cities [14]. Because of protests by middle-class city dwellers, factories have relocated to rural middle and western China, causing serious environmental degradation [38]–[40].

The new EPL looks good on paper, but local bureaus have often attempted to reconcile conflicting goals of economic development and environmental protection, and overlapping responsibilities further weaken EPL enforcement. As an eco-demonstrator of urban development existing in harmony with the environment—even on an ecological treasure like Chongming, Dongtan’s backers hope it will offer a new model for other bureaus [21]. Unfortunately, it will be difficult to copy the model wholly to other cities or even rural communes because of Shanghai’s financial and institutional support. On the other hand, without the ongoing work of the local farmers, this knowledge and the cultural landscapes, which have developed over centuries, will be lost in a very short time. Unfortunately the present development is towards more uniform land use, which makes the farmers increasingly dependent on fertilisers, pesticides, and seeds [40]. After all, tourists buy tickets for stereotyped unbroken-expanse seas of rape flower. This expected loss of cultural heritage would also endanger many animal and plant species. Strengthening new EPL enforcement in these areas is essential to avoid the spread of contamination.

3.2 Reappraisal of inhabitants’ living conditions in HCTVs

Generally, scholars and professionals are expected nominally to be the dominant force in conservation of HCTVs, rather than local inhabitants. But in fact, this is not the case. Those HCTVs are among the most characteristic examples of traditional Chinese towns and villages. They always have maintained their original form, in harmony with the natural environment to a remarkable degree. Their inhabitants are linked by blood ties, agriculture is the main economic activity, serious consideration is given to the geomantic environment, traditional customs are maintained, and there is a high degree of social stability. Therefore, local inhabitants should be optimal legacy keepers who enjoy and nourish those legacy voluntarily. But their living conditions is one of the most important long-standing but long-neglected issue.

The huge migration involved in the process of urbanization has always been regarded as one of the motive forces of China’s economic growth and development [1].

By 2012, 262 million people had migrated to urban areas. The majority of the rural-to-urban migrants are men, who seek higher wages in cities but leave their children, spouses, and aging parents in their natal towns and villages. The labour

shortage in HCTVs has led to increased uncultivated land and hastened significant changes to traditional agricultural practices \( [41] \) and handicraft techniques. Worse, the scale and pace of urbanization promise to continue at an unprecedented rate, as well as current trends rural-to-urban migrants hold. There is a consensus that the growth of new urban residents will undoubtedly imply mounting pressures for many migrants-target cities \( [1] [19]-[22] [42] \). But the concomitant impacts on migrants-source rural areas are always overlooked unconsciously \( [41] \).

For decades, the Chinese government collects copious data, but much is secret, and what isn’t classified is often unreliable \( [44] \). Without doubt, government-backed national survey is the best opportunity to provide abundant fodder for data-starved scientists hoping to track how China’s rapid development is shaping societal values. The Chinese Family Panel Studies (CFPS) may first endeavour to document the body of information on urban and rural families. Although CFPS are still let us embrace the profile of living conditions of rural inhabitants. On May 13, 2015, the National Health and Family Planning Commission (NHFPC), first delivered a working report – Chinese Family Development Report 2015\( [15] \). This report is based on a national survey – ‘Chinese Family Development follow-up investigation’ – organized by the commission last year, which covered 32,494 households and 184,439 people in 1,624 villages, 321 counties and 31 provinces, autonomous regions and municipalities. This report allows us to analyse dynamics within families as well as make comparisons across neighbourhoods, and there are several impressive findings should be taken into considerations:

Firstly, there is a huge gap of family incomes between urban and rural areas, as the income of the top 20 percent families is 19 times the income of the bottom 20 percent families. For all seniors, the external financial support mainly comes from their children. Rural seniors rely more heavily on their children financially than their urban counterparts.

Secondly, in rural areas, left-behind children make up 35.1 percent of all children living there, left-behind wives represent 6.1 percent of all wives, and left-behind senior parents account for 23.3 percent of all seniors.

Moreover, public services for families in rural communities is significantly lower than in urban communities. Those results help us understand comprehensively and systematically the basic situation of family in rural communities, as well as urban counterparts.

Little attention is devoted to the impacts of socioeconomic and political factors; China’s social, economic, and cultural variants mean that we may never exactly grasp what lies ahead in terms of future demographic trends \( [29] \). Also, little is known about how urbanization will change millions of Chinese farmers’ demographic behaviour and further affect future demographic trends \( [29] \). Fortunately, China introduced a Western-style pension system in the late 1990s, and the system today is divided along rural-urban lines and regionally fragmented with decentralized financial and administrative management \( [45] \). By the end of 2010, the Urban Basic Pension System covered 257 million urban residents, or about 40% of the urban population. In addition, 100 million rural people—15% of all population living in the countryside—have joined the new rural social pension system. However, the existing social protection arrangements, including pension, in China is in itself inequitable and therefore tends to broaden the urban-rural and regional gap rather than narrowing it.

### 3.3 HCTVs are vulnerable to natural hazards

Recent relentless natural hazards have wiped away large blocks of fragile wooden buildings and claimed thousands of lives in HCTVs. As a case in point, Wuyuan County is a county of Jiangxi province, east of China. Wuyuan, on the boundary of three provinces in Jiangxi's northeastern corner. Renowned for a magnificent landscape dotted with strange caves, deep secluded rocks and numerous historic sites, Wuyuan is one of the cradles of Huizhou culture, which was nurtured by booming trade and featured strong influences of clans and Confucianism. Wuyuan County, including 5 NHCTVs – Wangkou village, Sixi village, Yan village, Likeng village and Hongguan village, which is home to some of the best-preserved ancient architecture dated back to the Tang Dynasty (AD 618-907), since its remoteness and inconvenient transportation protecting its villages from too many visitors.

Each of the past 6 years, those villages have been hit and besieged by heavy or torrential rainfall, flash floods, typhoon, mudslides, landslides and other natural hazards, and so many historical and cultural heritage ravaged and damaged directly in those hazards, including ancient buildings\( [10] \). Deteriorated soil


\[16\] Heavy rainfall on May 17 and 18, 2010. 
erosion and climate change–derived torrential rains are always blamed for such disasters [48]. However, one more crucial factor is the lack of consideration of physical environment during urban expansion. In fact, those ancient villages have the profound historical experiences of embracing with exceptional and comprehensive water systems to against natural hazards like floodwater (Da and Yun 2010). The open watercourse runs through all the houses in the entire village and forms ponds, and the checkerboard pattern of streets, lanes and kanats follow the watercourse in turn led to significant lowering of water levels and the severe silting of watercourses.

Lu and Ran also argued that rapid urban expansion has occupied almost all the floodplains and alluvial fans, and the water pathways are strictly confined to an extraordinarily narrow channel, which severely undermines the natural regime of fluvial systems [49]. Water flow can easily exceed transport capacity of the narrowly contained channels, and the people living on the floodplains and alluvial fans are extremely vulnerable to floods and mudflows.

China has dramatically diverse climates in the north and the south of its vast territory. Those HCTVs, almost governed by counties, have developed in different regions, in different climates and natural environments, but they have certain features in common (Figure 10). They are usually located at the base of a mountain, alongside rivers or lakes, they have regular spatial layouts of quiet, narrow alleys, and picturesque gardens at the mouths of the rivers, have maintained their original form, in harmony with the natural environment to a remarkable degree. All historic cultures in those surviving HCTVs are vulnerable under the impact of irreversible trends as a result of social development and modernization, as well as natural hazards more frequently. Their overall planning, architectural style, and landscape design provide admirable models for the construction of human settlements. To immune radical changes, nowadays, it is time for us to seek the long-term strategy balance between human and nature, and seriously respect our ancient’s wisdoms that constitute exceptional testimony to the traditional culture of the region and all humanity.

3.4 Shifting pollution from urban to rural areas

China’s green movement is awakening and starting to receive global attention, and non-governmental organizations (NGOs) may suspend some planned industrial plants likely to cause widespread pollution via violent green protests [50]. But moving factories crossing an ecological “red line” from cities to rural areas is becoming more common. For example, the relocation by local government of a US$1.4-billion paraxylene plant from Xiamen City in Fujian province to the less-developed Gulei Town was not welcomed by residents [38].

Worse, little help from green NGOs or media attention always received when locals persuaded officials to scrap those relocations plans, although the protests also seem to be shifting from rural areas — such as when 500 villagers who feel that their lives are threatened by pollution and environmental damage in eastern Zhejiang province, they demonstrated in 2011 outside a solar-panel factory for discharging waste into local rivers. As a result, there are more than 200 cancer-cluster villages where pollution is suspected as the major cause of death [38]. Those chronic relocations may result in major water pollution within large-scale areas, and over-exploitation of underground water also damaged the ecosystem of the surrounding area [17].

3.5 Alleviation of Interior pollution in HCTVs: farms on the backline

China consumes nearly one-third of the world’s fertilizer, and the pesticide usage per unit area is 2.5 times the world average [40]. According to the Reports on China’s Soil Pollution Survey [18], aside from industrial plant waste and mining operations, the unsustainable use of chemical fertilizers and pesticides is a main human cause of widespread soil pollution. But interior pollution have been retarded in HCTVs for years.

First of all, farmers are not struggling for heavily dependent upon agricultural income via intensive farming and over-harvesting from cultivated land any more. The abuse of chemical fertilizers and pesticides remitted dramatically for cost-effectiveness consideration.

Besides, farmers would be subsidized to improve fertilizer use efficiency and encouraged to adopt organic and biodynamic farming methods that are not reliant on heavy input of chemicals [19]. And soil remediation projects would be implemented to improve the polluted soil gradually.

3.6 Biodiversity recurrence signals opportunity for ecosystem restoration

HCTVs are characterised as admirable models for the construction and biodiversity of human settlements. But now, biodiversity loss has been shown to lead to increased human, animal, and plant diseases. Of the 16,928 species that are threatened with extinction worldwide, almost 800 are in China; 25% of China’s species are endangered, and 233 vertebrate animal species are facing extinction [19]. The soaring rate of cancer in those “cancer villages” reflect the damage done to the health of its people.

On the other hand, toss in the not insignificant fact that

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local inhabitants in HCTVs are witnessing a dynamic reciprocity with surrounding environment and landscape with gradual alleviation of pollution. Some extinct species sensitive to circumstances are rejuvenating again for the ever-promoting plasticity of environment recent years. As strong evidence, *Triops cancriformis* (Bosc, 1801–1802), or tadpole shrimp, is a species of tadpole shrimp found in Europe, the Middle East and Japan [51][53]. It is generally believe that *Triops cancriformis* is one of the oldest animal species still in existence to date [54]. As biological miracles, although living wild insect *Triops cancriformis* is rarely reported, those living insects have rediscovered in in freshwater ponds and pools of villages in Inner Mongolia and Sichuan in China in recent years. They are all generally considered “the oldest living fossil” because basic prehistoric morphology has changed little in the last billions of years [55][56]. Those indicators for ecosystem restoration always gently tap our shoulders for a whole.

However, we also should pay more attention on those new potential agricultural pests, since *Triops cancriformis* has been reported as a pest of rice in Europe, *Triops longicaudatus* in California and Japan, and *Triops granarius* in Africa [57].

**Conclusion**

Heritage constitutes a source of identity and cohesion for communities disrupted by bewilderment change and economic instability. Creativity contributes to building open, inclusive and pluralistic societies. Both heritage and creativity lay the foundations for vibrant, innovative and prosperous knowledge societies. For years, China has made considerable progress in strengthening the protection of the status quo of the distinctive societie. But looming crisis make us realize that the solution to the cases, and finally strengthen governance toward modernization as well — and its implementation relied heavily on government administrative systems with financial and other incentive and disincentive measures. Therefore, interplays among the progressively interdisciplinary fields are expected in the further development that will finally help us penetrate to revivification of dynamic true nature under this intertwined picture. The latest generation of studies ripe for seductive endeavour in each extensile domain has not yet produced simple answers, but it is reframing the questions—a sure sign of progress.

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**References**


Figure 1: A 510-node merged network of co-cited articles on China’s villages (1995–2015) based on eleven 2-year slices.

Figure 2: A timeline view of 121-cluster hybrid network of cited articles and citing terms on China’s villages based on eleven 2-year slices.

Figure 3: A timezone view of 121-cluster hybrid network of cited articles and citing terms on China’s villages based on eleven 2-year slices.

Figure 4: A geographic map of co-author networks from 1995 to 2015 generated by Google Earth.

Figure 5: A geographic map of percentage change in malaria mortality rates (2000-2013).

Figure 6: Distribution of 252 towns on the approved list of 528 NHCTVs.
Figure 7: Distribution of 276 villages on the approved list of 528 NHCTVs

Figure 8: Proportion urban and rural population in China mainland

Figure 9: Distribution of 47 UNESCO World Heritage Sites in China

Figure 10: Map of 2853 county-level divisions in China mainland

Notes: For statistical purposes, the data for China do not include Hong Kong and Macao, Special Administrative Regions (SAR) of China

Source: China Statistical Yearbook 2014, “Divisions of Administrative Areas in China (End of 2013)"
Notes: Taiwan is not included in figure, and disputed areas are given as neutral a treatment as possible

Notes: Some the labels of the World Heritage Sites are invisible on account of dense

Notes: For statistical purposes, the data for China do not include Hong Kong and Macao, Special Administrative Regions (SAR) of China

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