

## **Historic preservation in Fast-Changing Cities - Case Study of the Hankow Historic Concession District**

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### **Abstract**

During the past three decades, since China's reform and opening up in 1979, there has been rapid urbanization and urban change in most Chinese cities as a consequence of economic growth. Facing the need for urban development, many local officials regard new construction as the representation of advanced and modern development as well as political achievement. Therefore there are many forces to change the appearance of the old city with consequences for historic buildings and districts which are of great cultural value but in poor condition. Although recently the concepts of historic preservation have been more widely accepted, there is still a challenge to meet the need of economic growth.

Taking the Hankow historic concession district as the case study, this paper aims to analyze historic preservation and renewal in fast-changing cities. The Hankow historic concession district was formed by Western countries' aggression in China during 1861-1898, its formation was greatly influenced by western cultures, and meanwhile it embodied the traditional and regional cultures of China. Presently this district has become an important part of the modern Wuhan's multiculturalism. The fast growth of Wuhan's urbanization has brought pressures on this district from both internal and external aspects, including local residents' urgent demand to improve their living environment and authority's expectation to maximize economic value of the land in the city center. Therefore historic buildings were once regarded as the obstacle of urban development, but in the last decade the value of the Hankow historic concession district has attracted more attention from the local authority, developers and the public.

The local authority has offered legal protection to this district at building, block and urban levels: First, regulations protect listed historic buildings; second, overall historic preservation of three blocks with a high density of well-preserved historic heritage and buildings has been undertaken; third, Hankow historic concession district has been ranked one of four urban historic preservation districts. Developers have also realized that historic buildings

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embody great economic value as well as cultural value, an example given in the paper shows that the integration of the old and new can create the urban place of historic and livable features as well as commercial success. Public and small enterprises were also encouraged to participate in the restoration and renewal of historic buildings by renewing internal conditions with the external appearance unchanged.

This study concludes that historic preservation and development seem now to be better balanced in Hankow based upon its urban characters and condition in the “fast changing” era of Wuhan. It also shows that the revitalizing of historic district needs both efforts and cooperation from the public and private sectors.

## **1. Introduction**

Since the reform and opening-up in 1979, China has witnessed high economy growth, rapid urbanization as well as ever-expanding city sizes. Facing the urban growth imperative, many China officials regard development as the symbol of urban modernization and political achievements. Nearly all China cities have massive urban construction undertaken under a variety of rhetoric over the past two decades, therefore urban growth turned out to be the explosive shift only instead of conventional evolution. Many historic cities have suffered, under those drastic urban transformations, various damages, even erasure of extinction and were replaced by the universal urban style. Such development homogenization puts all cities in one appearance, and thus the urban character crisis incurred raised concerns about historic preservation in public who increasingly recognizes that historic places not only demonstrate culture heritage but also work as the basis to build up urban character.

There are few well-preserved historic towns in urban China due to weathering through the ages and continued destruction or devastation, in which case the historic areas and districts with relatively concentrated historic buildings and still with residents have emerged into the primary carrier of urban culture heritage. China started to incorporate historic districts into its historic preservation initiatives in 1986, and then a number of historic districts were registered and conserved all over the country with Wuhan among the second-round list of National Historic Cultural City. For the purpose of preservation and usage of urban historic heritage and urban cultural character, Wuhan designated 4 historic townscape area, of which the Hankow historic concession district best survived owing to its historic buildings which is the greatest in number, with the most integral and best in conditions. At the same time, 4 of the 10 historic districts of the whole city lie in the areas according to Wuhan urban preservation planning.

The Hankow historic concession district is the legacy of former western colonial powers invading China, and served as the major intermediary to usher in western civilization in Wuhan. Its urban pattern was greatly affected by western

cultures while taking shape however still beared the imprints of Chinese traditional and Wuhan local cultures, and presently has become a major part of the culture diversity of Wuhan. During recent rapid urbanization of Wuhan, the Hankow historic concession district confronted pressures from both inside and outside. On one hand, local residents are in urgent need for living improvement due to heavily deteriorated infrastructure. On the other hand, because of the scarcity of land resource, the authority and developers attempt to maximize land value of the downtown. The Hankow historic concession district has therefore long been in the dilemma of historic preservation vs. urban redevelopment. With the transition from preservation of historic building to that of entire region, the government-led historic preservation initiatives were shifted from sheer regulatory conservation to the revitalization of historic neighborhoods.

## **2. The Making of Hankow historic concession district**

Hankow was specified as a trading port along the Yangtze River according to unequal treaties with western powers after the Second Anglo-Chinese War between 1856-1860. The concessions of the U.K, Russia, French, Germany and Japan were established one another after 1861, covering largely from present Jiangnan Road down to Mayang Street and in between the Yanjiang Road to the east and the Zhongshan Road to the west, totaling about 195 ha., bringing into being a riverside development strip. Infill development took place lengthwise afterwards as the territory expanded, forming a pattern of street block fronting the Yangtze River against the Jingnan Railway line.

The internal development in each concession was totally independent including urban planning, road system, drainage system, water supply and power system planning etc. However due to the adjacence to one another, the external transport links needed to be considered. Urban district pattern appeared in the early-opened British concession. Thus the later concession developments referred to this mode which followed uniform planning rules such as wharf, warehouse and yard along the riverside area for water carriage and distribution, layout of large scale public building along the riverside main road to improve the riverside landscape. The external side of the concession was functioned as commercial area. Residential and office area were planned between Shengli Street and Zhongshan Road with other functions of embassy, bank, hospital, school, church, trading, restaurants and other public buildings and residence, villa, residential and other residence etc. Thus quiet and noisy area was distinct between internal and external of the concession area. Such layout reflected the modern urban zoning characteristics, while the urban form still followed the traditional European classical style with tall buildings at the end of the main streets, and the continuity of the street interface were paid certain attention to.

After the establishment of the concessions of the five nations, consultants of another seven nations were setup. Since then, a great number of western –style buildings appeared in Wuhan and the unprecedented construction peak occurred in the Wuhan urban development history. With the rise of Westernization Movement, many modern factories, schools were then built in the concession area, including both pure Western-style and mixed-Chinese and western style, together with the modern factories, residential alleys and private villa by the public, these buildings became the symbol of the transformation from the traditional style to the modern.

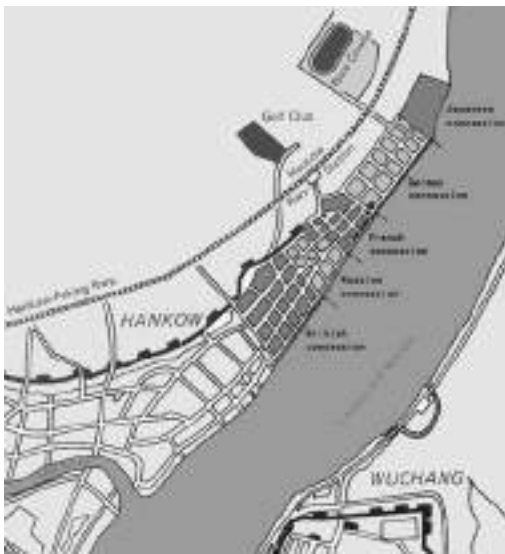


Figure 1. The Map of Hankow historic concession

### **3. The Present Situation in Hankow historic concession district**

Urban Wuhan has changed radically since the reform and opening-up policy and in only 30 years new building made up 90% of the total in its 8,000 Km<sup>2</sup> of region, which accelerated the disappearance of historic building in its downtown, in particular of the traditional wooden building that was left few due to its poor fire-and-erosion resistance, as compared to stone building that remains many thanks to its safety and durability, especially in the Hankow historic concession district. Nevertheless, the area is confronted with demolition from outside and plagued with redevelopment of itself as well. In general, there are five issues in present Hankow historic concession district as follows.

#### **(1) Damage to Historical Townscape**

Due to urbanization shock, the Hankow historic concession district has also undertaken sweeping demolition and development, especially in the north

part where few historic buildings were left and they are surrounded by new constructions. Even for the well-conserved old neighborhood in the south part, there are still some less harmonious developments resulting in serious inconsistency with the historical townscape in the aspects of the massing, color, style of new buildings. Moreover, the original spatial pattern and townscape have been damaged badly due to lots of environment variation or unauthorized constructions within their sites.

#### (2) Decline of Urban Vitality

The Hankow historic concession district was at one time the high-end quarter with many outstanding colonial buildings compete with public facilities and so was the place of dwelling, leisure and entertainment of the upper-middle class then. Its infrastructure got dilapidated over the time, and in addition, hollowing-out can be found downtown as its surroundings kept growing and new high-standard estates gave incentive to resettlements by downtown population. What are worse, more commercial shopping centers are settled during the period of urbanism and have a negative impact on commercial activities in the Jiangnanlu Commercial Street, the symbol of Wuhan commercial hub.

#### (3) Deterioration of Building Quality

Many changes have been made in the use of historic buildings in the area, such as housing turning into office, restaurant, recreation and etc. Some former single family houses were shared now by multiple families, leading to overload operation. What is more, historic buildings of the area have serviced generally longer than their physical life, their safety is declining year by year and even some have become dilapidated.

#### (4) Underdeveloped Infrastructure

It is evident that the standards of existing infrastructure are lower than those of modern urban living. Quite a lot of old neighborhoods even lack of sanitary fittings, most existing facilities of waters supply, drainage, electricity and etc. grew physically dilapidated, and new facilities like gas and CCTV remain substandard. Many of the roads have worn down without repair for many years. The Infrastructure that cannot meet the requirements of modern cities therefore has yet to be either improved or increased.

#### (5) Inadequate public space

Years of unauthorized developments keep reducing the otherwise already less public spaces. The surge of private cars ownership in recent years brings about parking problems that in turn add to the decrease of public space. New developments have increased greatly, which leads to more inadequate public spaces.

#### **4. The Preservation of Hankow historic concession district**

Urban character and culture heritage gain increasing attention with people's living standard's rising over the decade, and the public come to accept the historic preservation. In the recent decade, as the increase of living standard, more attention has been paid to the urban characteristic and cultural heritage. The concepts for heritage conservation ideas were gradually accepted by the public. The preservation for cultural heritage is reinforced by the local authority, and relatively complete classification, grades, hierarchical protection system was formed the main responsibility of different protection units has been clarified.

The preservation units are classified as two types: heritage conservation units and outstanding historical building. The former is the name for the unmovable cultural relics according to the National Heritage Preservation Codes and is of the highest level of protection; the latter refers to all the listed historic buildings by Wuhan urban Cultural heritage protection regulations and managed by the local Housing Managing Bureau.

The local urban planning bureau is responsible for the preservation of urban level and related planning strategies. The preservation unit is classified as historic district and historic scene district. The former refers to the districts which reflect traditional historic scene and local characters with relatively more numbers of historic relics, sites and buildings; The latter is greater in scale and refers to districts with historic buildings, urban patterns, building type and streetscape. With the increasing awareness of cultural heritage preservation, the range of preservation work expanded and has experienced the process from the level of building preservation to the level of historic environment.

##### **(1) The Preservation of Historic Buildings**

The Hankow historic concession district preservation began with the protection of primary historic buildings in it by filing and reviewing of Heritage Conservation Unit and implementation of corresponding measures in accordance with the National Heritage Act. Heritage Conservation Unit is classified by its significance into the 3 levels of State, province and city (county) and published by governments. 34 in all in Hankow historic concession district have succeeded in the register of Heritage Conservation Units since 1982, including 4 at State level, 5 at province level and 25 at city level. The local government designates boundaries of conservation and development control, sets up protection sign, files registry, in conformity with relevant rules of the "Measures of Hubei Province for enforcement of the National Heritage Act" and "Conservation measures of Wuhan Local government for Heritage Conservation Unit". Protection limit is confined to 10 meters outside Heritage Conservation Unit whereas its counterpart of development control largely to 20 meters outside it, and within it no development or act is allowed to harm the Heritage Conservation Unit or its surroundings. The style, height, mass, color must go harmonious with those of Heritage Conservation Unit and its surroundings upon new development, major repair or reconstruction within the development

control area. The proposals of project, maintenance, or reconstruction should get permitted by corresponding culture heritage authorities and approved by urban planning authorizes before its construction.

Criteria are quite strict in the selection of Heritage Conservation Unit, focusing only on those of historical, art, scientific significance and often closely related to history events or figures, as a result of which a lot of significant historic buildings have no access to legal protection, leading to a simplistic approach to preservation initiative. The local government therefore enacted the "Measures for Conservation and Management of Wuhan Townscape area and Outstanding Historic Building "in 2003, broadening the scope of historic buildings, which specifies those over 30 years old and of historical or cultural value as Outstanding Historic Building, and set explicitly conservation guidelines, duties of competent agencies, owners and users. On the basis of a survey by municipal housing administration department, reviewed by culture heritage and urban planning authorizes, and permitted by the local government, 54 in Hankow historic concession district are identified as Outstanding Historic Building with 8 at the first and 46 at the second class.

To advance further its regulation and rule for cultural heritage conservation, make the preservation endeavor more specific, for the ease of application, thus for better conservation, Wuhan enacted the "Wuhan Regulations for Historic Preservation "in 2007, taking it as an important agenda. Meanwhile, the authority made more commitment to it and have repaired some historic buildings, for instance, the 4 in Hankow historic concession district have been well maintained and greatly improved their conditions, guided by the principles of cultural heritage repair and technical requirements.

## (2) The Preservation of Townscape Area and Historic District

Because of the prominence of Hankow historic concession district in the evolution of urban Wuhan, Wuhan Master Plan 2006 specified its south as one of the 4 townscape areas that hold the greatest amount of historic buildings and highest historical values, noting that priority should be put in maintaining the integrity of downtown characters and their continuity, appropriate designation of character-compatible area, restructure of land use, and control of population. Townscape area should protect styles of historic building, regulate those of new buildings to make them in harmony with their contexts, in principle no change should be made to existing road patterns and current names of streets and places be retained. Also, the master plan had mapped 4 historic districts within the historic concession quarter, that is, the neighborhoods between Jiangnan Road and Zhongshan Road, along Qingdao Road, around venue of the "CCP August 7th Conference", and around Yiyuan Road, each with conservation priorities.

The Wuhan Historic and Townscape Region System Planning by Urban Planning Bureau in 2009 extended historic conservation sites, adding 12 historic districts, and for the first time covering the quarter to the south of Jinghan Avenue in the north of Hankow historic concession district. To carry out historic preservation in the Master Plan 2011 and in the system planning above, explore the methods of creating Regulatory Detailed Planning concerning historic districts, and better serve urban regulation, Urban Planning Bureau is coordinating the formulation of Regulatory Detailed Planning for the 4 historic districts in Hankow historic concession district, the work of which is under review now.

Table1. Authorities for Cultural Heritage Preservation and Their Duties in Wuhan

Authority		Units(immovable heritage)	Work
Municipal Government	Urban Planning Bureau	Townscape region Historic district Cultural heritage units Outstanding historic building	Planning and administration of historic heritage, including plan creation and review.
	Housing Administration Bureau	Outstanding historic building Ordinary historic building	Administrative control of the safety, use, maintenance of outstanding and ordinary historic buildings.
	Cultural Heritage Bureau	Cultural heritage units	Administrative control of townscape region, historic heritage unit, and outstanding historic building in accordance with relevant laws and rules.

## 5. The Revitalization of Hankow historic concession district

How to achieve sustainable growth in historic heritage arises, as the preservation agenda in the Hankow historic concession district shifts from unit to outstanding Historic Building, and single Monumental architecture to historic district and even the morphology of entire downtown. The experiences by Shanghai, Tianjin, among others, that link historic preservation with urban growth arouse extensive attentions, and the initiative to combine conservation with re-use came to prevail in addressing historic districts. That process

developed rapidly, during the transition the government, developer and the public all vigorously provide support. As such, the Hankow historic concession district area began its recovery only several years later.

#### (1) Government Developing Revitalization Scheme of Historic District

Economy-oriented land use Restructure became of the priority of the revitalization undertaking in historic districts. The Hankow historic concession district used to be the upscale business center, the first agglomeration of finance and trade services in Wuhan's history second only to that in Shanghai. Based on the local government's strategy, the Urban Planning Bureau worked out the "Development Planning of Wuhan Riverside CBD "in 2008, to make full use of cultural heritage advantages of the historic concession area, and promote it as the finance and business center , creative industry base, and culture-tourism destination, 5 major strategies of modern service industry are developed to build on business headquarter economy, scale up boutique business, move forward with culture-creative industry, integrate IT industry, enhance tourism and entertainment industry. Meanwhile, various conservation models, such as priority protection, coordinated protection, and development protection, are adopted to featured locations within the historic concession area and on specific basis of different sites.

During building the Riverside CBD, the Qingdao Road region initiated the protective development agenda of Wuhan's historic concession district that has to be demolished in part because the Yangtze River Tunnel runs through beneath it. The negative effect taken as a catalyst, the area above the tunnel is being redeveloped as public space, around which a pedestrian space is under construction complete with culture-creative industry, commerce, finance, tourism and entertainment, adapting to modern needs, adopting new features, boosting vitality, and improving environment through the conservation, rehabilitation and redevelopment.

#### (2) Developers Shaping Mix of Old New Dynamic Neighborhood

The success of Shanghai's Xintiandi project demonstrated a new approach to Wuhan's urban renewal, i.e. linking preservation to development by converting history resource into commercial resource, which was applied once more by the developer to Wuhan Tiandi project located in the former Japan's Hankow concession in 2005. Outside the downtown conservation area, the site is allowed for massive development. Instead of scrap and build redevelopment, it kept all of the 9 historic buildings within its site that are neither Heritage Conservation Unit nor Outstanding Historic Building registered by the local government, undertook renovation and alteration work, and added new use, making the historic building radiating new unique charm, well blending in with surrounding modern buildings, creating an original Hankow-like atmosphere with retail, restaurant, entertainment, business, hotel and etc. The premise gets widely popular since its completion in 2009 and now becomes of a city branding. Its success rests not only in set of modern urban design elements like

mix-use, compact configuration, pedestrian circulation, diversified public space and etc., but more in deliberate conservation and subtle remaking of historic elements integrated into modern life, in which small fashion buildings meets old-fashioned mansion, street pool, old trees, gallery, shop, restaurant, café, and bars all come together, whereas people are exposed to the history and culture of Wuhan in their leisure-time. The project brings people about the recognition that historic preservation and urban development can get along.

### (3) Partnership and Re-use of Historic Buildings

The Hankow historic concession district's preservation endeavor is increasingly focusing on the sustainable growth of historic heritage. The Municipal Housing Administration Bureau established the re-use principle of outstanding historic building, asking to make full use of value of Outstanding Historic Building and well integrate its social and economic benefits, by function replacement, interior alteration, environment making, and commercial operation, in light of the characteristics and modern function, based on retaining original style and inheriting history and culture.

Some strong enterprises began investing heavily in the renovation of Outstanding Historic Buildings to host them. The former French Calyon is repaired and rented by Agricultural Bank of China Hubei Branch. Another, Tukunshan mansion, after a massive renovation by China Oil and Foodstuffs Corporation, has become a place for dining and gathering. Those along the river within the former British concession also did it, turning into nostalgic café or bar street. Many artists also came into the quarter refitting old houses into studio, salon, gallery, and freelance artists flock around the Lanling Road, known as "artist village" within the former Russian concession.

## **Conclusions**

The historic concession district is the shift of Wuhan urban spatial form from the traditional to the modern development. In the recent 100 years, the communication and integration of Chinese and foreign cultures have left deep imprint on the urban form etc., which are considered as the valuable for the future urban development. In the rapid growth of urbanization in Wuhan, the concession district has been in the conflicts between conservation and development and experienced the process from the sharp opposition in the beginning to the pursuit of win-win situation and this process also represents the social and economic change of Wuhan. The acceptance of the value and importance of historic preservation by the public, the authority and the real estate could promote the historic district from decline to revival. In the background of "chasing the new change" era in China, Wuhan is exploring a unique way to balance the preservation and development in the historic district. However, according to the case study of historic concession of Hankow, a number of aspects in preservation and development are in need of improvement. For example, in the aspect of historic preservation, the public resources are almost entirely focused on cultural relics protection units and

outstanding historic buildings, while neglecting of the preservation of general historic buildings, which results in the further deterioration of the overall environment of the historic districts.

On the other hand, in recent years, the re-use of the historic district which aims at revival is in the ascendant development, however with a too strong economic driving force underlying. This kind of development led to the contrary results to the basic principles of historic preservation, such as forcing relocation of local residents for the purpose of commercial development, manufacture of fake antiques to maintain the historic style of the old city etc, and it is clearly shown that historic preservation still needs research and thinking, as well as further legislative protection and public participation. Only when historic preservation is regarded as an universally shared value, could the government, developers and the public form a joint force, and promote the historic districts from decline to revival, and truly realize the sustainable development of the historical heritage.

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## **Policy Implications for the ESPON Climate Project Vulnerability Assessment**

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### **Abstract**

The ESPON Climate project is an Applied Research Project conducted within the ESPON 2013 Programme. The project can be considered as a response to the EU 2007 Territorial Agenda, Priority 5, which stipulates a need for developing Cohesion Policy with respect to territorially differentiated effects of climate change and for further development of transregional approaches to overcome natural hazards. More explicitly, ESPON Climate also addresses direction given in EU legislation from the EU White Paper “Adapting to climate change: Towards a European framework for action” which states that strategic approaches to spatial planning are needed for territorial development.

In consideration of this policy background, the ESPON Climate project produced a Pan-European vulnerability assessment which identifies regional typologies through analysis of exposure, sensitivity impact and adaptive capacity as components of overall vulnerability. It creates a basis for tailored-made strategies for adaptation due to the regional specificity emphasised within the project. These regional responses to climate change are further addressed within the seven case studies evaluated and communicate the diversity of responses to climatic stimuli. The project provides a territorial focus which is commonly lacking in most related studies. The focus is one which addresses regions within and across European territories rather than maintaining the more commonly used sectoral focus. The project also addresses the need to consider Europe as a whole, to assess what consequences European regions will face in regard to climate change, and how this affects the competitiveness of Europe as a whole and the cohesion of European territories. Through this assessment, ESPON Climate creates an evidence base for policy through possible scenario outcomes. Though the project does not provide a clear cut forecast, it offers a basis for recommendations for policy development toward climate change adaptation.

Concluding findings of the project provide policy recommendations for the development of European regions. The analysis identifies hot spots, or areas most affected by climate change, emphasising the need for developing tailor-made adaptation strategies for example in Southern Europe and for areas such as the Alps and the Mediterranean where tourism will be greatly affected. Also identified are the challenges to spatial planning and which types of regions should be targeted in terms of increasing emission reduction measures. The analysis additionally establishes that countries which are most highly affected have lower adaptive capacity and that this is contradictory to current and future aims of territorial cohesion. These and other findings of the project assist in the understanding and implementation of context appropriate strategies. These strategies will be crucial in overcoming present and future challenges to territorial cohesion and in achieving a harmonization of territorial development.

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## **Acknowledgement**

This brief paper is derived from the more extensive literature found within the ESPON Climate Final Scientific Report (2011) and the forthcoming chapter ‘Implications for territorial development and challenges for the territorial cohesion of the EC’ in *European climate vulnerabilities and adaptation: A spatial planning perspective* (Greiving and Schmidt-Thomé, forthcoming). The reader is encouraged to consult these documents for further information.

## **1. Introduction to Brief Policy Background**

The European Union is currently pressed by many challenges including unemployment, financial crisis, demographic change, movement toward a low-carbon economy and the development of strategies for climate change adaptation. Development and implementation of responses to these challenges necessitates action and initiatives within both vertical (EU, national, and regional levels) and horizontal (across sector) dimensions of governance. This is particularly the case when considering efforts within EU competitiveness and Cohesion Policy which must take into account the spatially differentiated impacts of climate change. Anticipated changes will produce significant economic, social and environmental impact which will vary largely by region, sector, and social groups. Challenges posed by these changes require a place-based approach to actions taken toward implementation of adaptation strategies. This is particularly due to the spatial variation of climatic impacts. With regard to mitigation, the Europe 2020 Strategy adopted by the European Council in 2010 provides specific energy goals toward reducing greenhouse gas emissions and increasing energy security. The Strategy additionally specifies the following priorities (COM, 2010, p. 3):

- Smart growth: developing an economy based on knowledge and innovation.
- Sustainable growth: promoting a more resource efficient, greener and more competitive economy
- Inclusive growth: fostering a high-employment economy delivering social and territorial cohesion

The Strategy also includes a ‘Resource efficient Europe’ as one of its seven flagship initiatives which, in combination with the above-stated priorities, contributes to both climate change mitigation as well as EU competitiveness. This is achieved through the Strategy’s “smart, sustainable and inclusive growth” agenda which aims to reduce emissions and to encourage positive economic growth (COM, 2010, p. 13). The importance of this in relation to EU competitiveness is apparent in the need for reducing energy insecurity and in reflection of pledges already made for emission reductions within the 2009 Copenhagen Accord. However, even if these pledges are met, consequences for competitiveness will still be far-reaching due to the changes already underway. With respect to this fact, actions must be taken now to avoid substantially higher costs of inaction in the future (OECD, 2009). Direction for these actions has been provided within the adoption of the EU White Paper on Adaptation to Climate Change in 2009 which acknowledges the regional vulnerability of climatic impacts and the crucial role of these impacts on the future of European competitiveness. Disparities in regional vulnerability and capacities toward adaptation and mitigation are addressed in both the White Paper and the outputs of the ESPON Climate Project. The disparities highlight how economic development is often correlated with mitigative capacities. This is exemplified by regional differences such as the difference between the lower mitigative capacity and weaker performance in competitiveness indicators of South and East Europe verses that of North Europe. A further example is found within the gradient revealed between East and South Europe which additionally identifies a particular weakness of the peripheral regions compared to that of the core.

The results of the ESPON Climate project reveal that the economic sectors most directly affected include primary as well as the tourism and energy sectors, again with the periphery regions most adversely affected due to their higher vulnerability. These regional imbalances are exceptionally important when considering the impact to European territorial cohesion and are particularly important to future solidarity. Most crucial in this respect is the potential for a widening and deepening of disparities and a compounding of inequalities as a result of climatic impacts.

What these inequalities necessitate is the regular inclusion of climate change policy within rural territorial development as is required under the holistic approach of the Renewed Social Agenda in 2008 (COM, 2008). Inequalities within and beyond rural development will more specifically be affected by the potential change in frequency and intensity of natural hazards including flooding, landslide, forest fire, drought and heat waves which will significantly impact both physical and human capital. The potential loss of physical capital, such as infrastructure, and human capital, such as loss of working days and lives, can produce adverse consequences for EU competitiveness. The ESPON Climate research, however, emphasizes that some climate change impacts produce potential opportunity for capitalization toward reducing these disparities. This is an important part of territorial cohesion and is stressed within the EU’s Fifth Cohesion Report (5CR).

The 5CR explicitly addresses the ‘third dimension’ of Cohesion Policy, territorial cohesion, introduced originally within the Lisbon Treaty (EC, 2010). In contrast to the other economic and social dimensions, territorial cohesion emphasizes the importance of “access to services, sustainable development, functional geographies and territorial analysis” and further states that climate change and energy goals require coordination at all governance levels (EC, 2010, p. 24). This is in order to prevent counteractive policies and additionally places stress on the regional, more local levels. The 5CR addresses these issues and acknowledges differences in intensity of impacts, but does not elaborate on how the variation of impacts will affect future Cohesion Policy. The ESPON Climate project attempts to remedy this gap by identifying regions which are most adversely impacted and should be targeted for financial assistance. Though this project clearly states that it does not provide a clear-cut forecast, it assists in current efforts to improve Cohesion Policy and future growth strategies toward harmonious territorial development.

## **2. Main Findings of the ESPON Climate Project**

The ESPON Climate project conducted a Pan-European vulnerability assessment and evaluated seven case study areas. The assessment focused on five impact dimensions: social, cultural, economic, environmental and physical impact and three elements which determine the regional capacity to adapt: awareness, ability and action. These dimensions serve as an important part of the ESPON Climate methodological framework. Suggestions for policy options are based from the Massey and Bergsma (2008) classification of adaptation objectives: adaptive capacity enhancement, reduction of risk and sensitivity, coping capacity and capitalisation.

The social dimension considers the adversely affected populations exposed to heat waves, flooding, and sea level rise and tends to target adaptation policies to reduce risk such as loss of life. The cultural dimension focuses on susceptible historical sites and landscapes which are exposed to flooding and concentrates on policies toward flood risk reduction especially for the tourism sector. The economic dimension varies by sector with policy recommendations including a need for flexibility, for granting autonomy for business adaptation, and for evaluating opportunities for capitalisation especially in the tourism and agricultural sectors. The environmental impact dimension targets primarily ecosystem indicators with adaptation policies to enhance coping capacity through maintenance of ecosystem services. Adaptation policy for the physical dimension focuses on risk reduction through planning regulations and codes and capacity building of emergency services. Though it is acknowledged that the ability to address adaptation objectives is highly spatially dependent, trends can be observed within these dimensions and are summarised as follows:

- All dimensions need both short and long term adaptation planning
- Adaptive capacity enhancement: is oft a result of early warning systems, education and information sharing

- Risk and sensitivity reduction: requires revision of current and specific policies and regulations
- Coping capacity: is found within focus on response of emergency services
- Capitalisation: is very tourism centred, while few in-practice examples exist

The information provided in the assessment also highlights what can be divided into several categories of the main findings: regional consequences, challenges and typologies in the spatial context, and recommendations for development of climate change strategies<sup>1</sup>. This is followed by a brief section on affects to European competitiveness and cohesion.

## 2.1 Regional Consequences

This section is broken into three main sub-sections. The first provides the ESPON Climate project's identification of consequences using the INTERREG IV B & C programmes' 10 trans-national regions, while the second sub-section provides consequences as analysed through regional typologies. The third sub-section provides a brief explanation of mitigative typologies.

### 2.1.1 Consequences on Trans-National Regions Assessment

The ESPON Climate project has generated a regional analysis through identification of climate change issues utilising the 10 European trans-national regions of the INTERREG IV B & C programmes. The analysis identifies a reiteration of the following events throughout the regions: sea level increase, flooding, forest fire, drought, extreme weather conditions and events, and a potential for increased frequency for natural damages. The summary for this analysis is provided in Table 1<sup>2</sup>. The information in Table 1 provides each trans-national region specified by the INTERREG IV B & C programmes and includes the climate change issues identified in each region by the ESPON Climate project as well as recommended options for future programme development.

Table 1. Climate change issues identified by ESPON Climate European for each trans-national region

Region Identified	Climate Change Issues Identified by the ESPON Climate project	Options for further programme development
Northern Periphery	flood sea level rise	-Risk management for settlements potentially affected by river floods related to climate change

<sup>1</sup> The ESPON Climate project employs the definition for adaptation provided by the IPCC Fourth Assessment Report stating adaptation is an "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (Klein et al, 2007, p.750).

<sup>2</sup> Tables within this paper are taken from the forthcoming chapter 'Implications for territorial development and challenges for the territorial cohesion of the EC' in *European climate vulnerabilities and adaptation: A spatial planning perspective* (Greiving and Schmit-Thomé, forthcoming).

<b>Baltic Sea</b>	storm surges sea level rise floods & flash floods changing frost changing precipitation	-Further development of Regional Adaptation Strategies related for climate change impacts on forestry -Climate change impact assessments on coastal and island areas, including tourism and water quality (algae blooming)
<b>North West Europe</b>	flood (river & flash) sea level rise storm surges	-Combination of flood and storm surge prevention and spatial planning as cross border and transnational initiatives.
<b>North Sea</b>	flood (river & flash) sea level rise storms (& surges)	-Combination of flood and storm surge prevention and spatial planning as cross border and transnational initiatives.
<b>Atlantic Coast</b>	flood (river & flash) sea level rise storms (& surges)	-Development of regional strategies to anticipate the impact of river floods -Development of regional strategies to anticipate the impact of storms and storm surges
<b>Alpine Space</b>	floods & flash floods changing precipitation	-Diversification of tourism, also interlinked with water scarcity -Integration of sustainable crossborder adaptation and mitigation concepts -Options of enhancing synergies to avoid conflicts (especially on adaptation measures) -Over regional and transnational water management approaches, especially focusing on the Alps as a “water tower”.
<b>Central Europe</b>	floods & flash floods changing frost changing precipitation + summer days + summer temp. sea level rise	-Development of regional climate change adaptation strategies on floods, heat waves, forest fires -Development of regional climate change adaptation strategies on water scarcity -Development of regional climate change adaptation strategies on tourism -Development of regional climate change adaptation strategies for agriculture and forestry
<b>South West Europe</b>	agriculture forestry flood sea level rise	-Development of regional transnational climate change adaptation strategies on heat waves, water shortage and forest fires.
<b>Mediterranean</b>	storm surges droughts floods forest fires changing precipitation + summer days Sea level rise	-Management of public (including tourism) water demand. -Identification of possibilities to save water instead of relying on current -Water management schemes and further development of desalinisation plants. -Avoidance of mal-adaptation, e.g. transferring costs and risks from water sector to energy sector -Management of land take (urban sprawl)
<b>South East Europe</b>	flood sea level rise changing precipitation changing evaporation + summer days Sea level rise	-Emphasize analysis and management concepts on impacts of climate change on forestry and agriculture -Development of common (crossborder) methodology for land use restructuring, including integrated water management planning

Of the INTERREG IV B & C programmes considered, adaptation to combat adverse climatic impacts was not found to be a priority but appeared to be indirectly addressed in the majority of the programmes through efforts toward sustainable development, environmental protection and natural risk avoidance. Actions within these efforts take the form primarily of water management development and risk prevention. Aside from this observation, the ESPON Climate project identifies that when climatic stimuli are applied the most prominent impacts across all regions are found in the following order: flooding, storms, precipitation change and sea level rise.

The results of the vulnerability assessment enable a further classification of these 10 trans-national regions into three major groups which are identified in Table 2.

Table 2. Three major groups identified by the ESPON Climate project vulnerability assessment utilising the INTERREG 10 trans-national regions.

<p><b>1. Regions where vulnerability is expected, as a rule, to increase at a high or medium rate</b></p> <p><b>Regions:</b> Mediterranean Region, South-Western and South-Eastern Europe</p> <p><b>Description:</b> impacts accrue primarily in the environmental and economic dimension, overall growth of vulnerability related to poor adaptation capacity</p> <p><b>Proposed solutions:</b> program measures addressing e.g. water management, preservation of water, forest fire forecasts, preparation for heat waves and regulation of land use would potentially have the greatest importance</p>
<p><b>2. Regions where vulnerability is expected, as a rule, to grow at a low rate</b></p> <p><b>Regions:</b> Northern Sea region, the North-Western European and the Atlantic coastal regions (includes also some Alpine regions)</p> <p><b>Description:</b> increase of climate change impacts is projected primarily for the physical and social dimensions</p> <p><b>Proposed solutions:</b> measures addressing natural disasters such as floods and coastal storms would have the greatest positive effects</p>
<p><b>3. Regions, where vulnerability is expected, as a rule, not to change significantly</b></p> <p><b>Regions:</b> Baltic Sea region, the Northern periphery and Central Europe (the lattermost can also be in part of the second group)</p> <p><b>Description:</b> climate impacts are diverse but not extreme</p> <p><b>Proposed solutions:</b> adaptation measures should stress the importance of the role of water management and prevention of natural disasters</p>

The table (Table 2) identifies the regions in terms of the severity of change in vulnerability as estimated by the ESPON Climate project. The table further provides a description of the climatic impacts and a few recommendations as to potential solutions. What can be concluded from the table is that certain hot spots, or areas most affected by climate change, are found within the Mediterranean region, South-Western and South-Eastern Europe. This is in large part due to the poor capacity for adaptation of the region coupled with significant impacts felt within environmental and economic sectors, especially for the potential impact to the tourism industry. Forecasting, preparation and land use measures are suggested as having the greatest potential benefit in remedying adverse consequences. Climatic change is found to be significant but to a lesser degree within the some Alpine regions, the North Sea, and the North-Western and Atlantic coastal regions. Impacts within these regions tend to

affect primarily physical and social dimensions and are recommended to be addressed through measures that specifically target natural disasters including coastal storms and flooding. The last category consisting of the Baltic Sea region, the Northern periphery and Central Europe faces diverse impacts that are estimated as having no significant changes. In keeping the severity of change to an insignificant level, it is encouraged here to consider adaptation measures stressing natural disaster prevention and the importance of effective water management practices.

### **2.1.2 Mitigative typologies**

With respect to climate change mitigation, the ESPON Climate project has identified what can be described as mitigative typologies<sup>3</sup>. Within this identification process, the project makes use of the mitigative capacity definition as provided by the IPCC, “a country’s [or region’s] ability to reduce anthropogenic greenhouse gas emissions or enhance natural sinks” (IPCC, 2007, p. 818). The analysis of typologies considered social factors including educational commitment and attitude towards climate change as well as the availability and extent of the following: technology for reducing emissions, availability for non-carbon energy sources, land use type, mitigation policies, and government effectiveness and economic resources through income per capita. Four types of regions were produced as a result of the analysis:

1. regions with high capacity and low emissions
2. regions with high capacity and high emissions
3. regions with low capacity and low emissions
4. regions with low capacity and high emissions

The analysis further emphasized the importance of particularly types 2 and 4 as both indicate the most obvious areas in which action toward reduction measures should be taken.

## **2.2 Challenges and Typologies in the Spatial Context**

Aside from the analysis provided above, the project also produces a spatial planning focused analysis generated in terms of identification of spatial typologies and the immediate challenges faced. The project acknowledges and builds off previous work by Massey and Bergsma (2008) as well as Greiving and Fleischhauer (2012) who review European spatial planning perspectives. Through the reviews, it is asserted that spatial planning is related to land use within adaptation policy development and that though its role is growing in importance this role is not well recognized (Greiving and Fleischhauer, 2012). This role is further differentiated based on the planning policies of various countries where, for example, a role is assigned in Germany, France, Hungary, a central role is played in the UK and the Netherlands, and a role is not assigned in Finland and Spain (Greiving and Fleischhauer, 2012). It

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<sup>3</sup> The use of the word mitigation follows the definitions provided in IPCC (2007) and Füssel and Klein (2002) where mitigation is an effort to reduce climatic changes by reducing greenhouse gas emissions and through enhancing carbon sinks.

is recognised that consideration of particularly a spatial focus is especially important for adaptation at the regional level not only for political reasons, such as policy with respect to the role played, but also territorially with respect to type of spatial designation. This topic is elaborated within the next sub-section.

### **2.2.1 Spatial Typologies**

The Pan-European vulnerability assessment recognizes and identifies variability of impact not only for specific types of regions, such as those previously mentioned from the INTERREG programmes, but also between and within these regions. This variation is spatially determined and is represented within the ESPON Climate project through regions based on spatial typologies. These are listed as follows: metropolitan/urban, rural, mountain, coastal, sparsely populated, islands, and border regions. The analysis considers the climatic impact, adaptive capacity and vulnerability and provides some policy recommendations within each typology.

The metropolitan/urban regions were found to have high impact particularly for the highly populated coastal areas, Alpine areas and especially Southern Europe. Impact is largely dependent on the characteristics of these regions such as the concentration of both people and infrastructure. The ESPON Climate analysis states that, for these particular regions, there is a need to establish a common ‘spatial vision’ through collaboration of both spatial planners and civil society because of the management constraints of limited space and resources. The vision must include diversity of structural sensitivities as well as system redundancy (where main elements of the system can be interchangeable) and robustness (where e.g. infrastructure and vegetation strengthen resistance to adverse impacts).

Analysis of rural regions highlights a range of low to high potential impact with particular adversities for Southeast Europe. These regions are economically not as robust as other regions and have consequentially lower adaptive capacity. To remedy this, attention must be paid especially to economic development, particularly for areas facing water scarcity.

Impact is considered medium to high for mountain regions; Southeast Europe, Spain, Greece and the Southern Alps being especially affected. Impacts are exacerbated through the inaccessibility of transport, demographic changes, and triggering of natural hazards by climate change which requires hazard assessment and risk mapping.

Coastal regions have medium to high impact due to potential sea level rise which necessitates a need for Integrated Coastal Zone Management for improving coastal defences in combination with settlement restrictions. Potential capitalisation opportunity exists with potential for increased tourist comfort in Northern Europe.

Sparsely populated regions must be considered in terms of relative and not absolute impact because there are relatively few assets within these regions which include part

of the interior of Spain, Scandinavia and Scotland. Improving accessibility is suggested particularly for the periphery regions.

Islands in the Mediterranean and Atlantic face severe impact due to their reliance on tourism and agricultural sectors combined with low adaptive capacity. Solutions proposed include diversification of economic activities especially those which conserve freshwater resources and are generally less climate sensitive.

A wide range of impacts exist for border regions due to differential sensitivities (e.g. population density, settlement patterns, economic development, and general adaptive capacity). Solutions suggested for these regions include particularly strategies balancing economic development, environmental issues, and demographic change.

Overall, the analysis of spatial typologies reveals that the Mediterranean and Southeast Europe have the highest vulnerability because of high impact and low adaptive capacity, especially those areas in the Mediterranean and the Alps which depend largely on the tourism sector. The typologies identify the vulnerability of these among the other spatially differentiated regions and suggest that each area has a different starting point for the investment and effort needed. Taking the typology analysis into consideration, it must also be acknowledged that challenges exist for the spatial approach to implementing climate change strategies.

## **2.2.2 Challenges for Spatial Planning**

The ESPON Climate project identifies that in taking a spatial approach to adaptation and mitigation one must consider important challenges faced by spatial planning. Already existing structures are a particular challenge especially for adaptation strategies and must be considered within implementation of an RAS, or regional adaptation plan. Spatial planning is considered more relevant for still developing areas because conflicts arise between adaptation enforcement and pre-existing private property rights. To remedy these conflicts, it is recommended to avoid regulatory (or conforming) planning and to provide compensation schemes for affected private property owners.

The role of spatial planning should also be considered as it is and can be applied across sectors and governance levels, though challenges arise in that this role is not well understood, well-developed nor emphasised within strategies toward mitigation and adaptation (Davoudi et al., 2009; Mickwitz et al., 2009; Greiving and Fleischhauer, 2012). There is a need for a multi-level (vertical) and cross-sectoral (horizontal) governance approach because sectors are differently affected by climate change impacts. If the role of spatial planning follows a comprehensive planning approach to climate change strategies, this can consider both institutions within and across different levels and the involvement of multiple actors in order to establish legitimacy of recommended actions and to account for normative values (Mickwitz et al., 2009). The inclusivity of this approach is an important feature of climate change governance and has been cited within both European legislation and recent

literature as essential for effective adaptation strategy development (Ribeiro et al., 2009; Swart et al., 2009; Meister et al., 2009).

### **2.3 Recommendations for Climate Change Strategies**

In addition to the typologies presented and the identification of particular challenges within the spatial context, the ESPON Climate project identifies specific recommendations for adaptation and mitigation strategies. The project recognises and discusses briefly the interconnectivity between the two kinds of strategies. The linkages between these strategies are acknowledged especially by the IPCC Fourth Assessment Report and described within three types of relationships (Klein et al., 2007):

- Direct relationship: involves use of the same resources (e.g. land and stakeholders)
- Indirect relationship: involves connection through budgetary allocations
- Remote relationship: involves distant connection (e.g. currency exchanges)

The project reiterates and recommends the notion that establishing an understanding of the type of relationship is crucial for developing effective mitigation and adaptation, especially in avoidance of potentially counteractive strategies. What must be further understood are the four types of interrelationships also identified by the IPCC, two of which are discussed within the ESPON Climate project: 1) strategies for mitigation which impact adaptation and the inverse 2) strategies for adaptation which impact mitigation. This occurs when, as an example of #1, mitigative reforestation efforts impact adaptation by influencing the water budget and biodiversity of a given region or when, as an example of #2, adaptation efforts require additional energy resources.

#### **2.3.1 Recommendations for Adaptation Strategies**

Specific to adaptation strategies, the project recommends more research and development for that which requires international cooperation such as forecasting systems, planning methods and knowledge transfer as well and coping strategies especially for those concerning natural risks (e.g. flooding). Within cooperation for all adaptation strategies is a need to consider multiple levels of governance because implementation at one policy level is not independent of implementation at levels both above and below. It is further recommended to take into account more social measurements including demographic changes and to encourage more concentration on integrated water management particularly when dealing with transnational prevention of flood risks. Specific to tourism and agricultural sectors, special attention should be paid to changes in availability of water as peak water demand and seasonal reduction in supply occur at the same time (Amelung and Moreno, 2009). This is especially important because of the economic role played by tourism in regions such as Mediterranean and the Alps which are even acknowledged in the EU White Paper on Adaptation as susceptible to climate change impacts (COM, 2009). It

is, however, also important to consider what the ESPON Climate project highlights as opportunities, or capitalisation, for these sectors where diversification of both industries can lead to beneficial adaptation strategies. Opportunity for capitalisation is found also within recommendations for mitigation.

### **2.3.2 Recommendations for Mitigation Strategies**

Though substantial difficulties exist in estimating how the energy sector can develop particularly due to uncertainty of estimated impacts, the project recommends encouragement of capitalisation in current and future policy development with respect to mitigation strategies. This is a relatively new concept and takes form in mitigation strategies through opportunities in reduction of energy consumption and increase in energy production. This can additionally mean provision of market opportunities by development of carbon neutral technologies. One more specific example exists in taking advantage of favourable wind power conditions in Northern regions and connecting these to areas of high consumption. Opportunities also exist within the tourism sector, especially within the Alpine region, where development and implementation of climate neutral facilities can be encouraged through mitigation measures.

### **2.4 Affects to European Competitiveness and Cohesion**

The analyses provided by the ESPON Climate project identified the above recommendations and regional typologies based on place-based characteristics of climate change impacts and assists in determining priorities for future territorial development. Identification and variation particularly for regions which are most vulnerable is acknowledged within the 5CR. However, the project provides some solution to the 5CR's lack of further explanation for future policy development. There is a need for a transnationally coordinated approach which must include consideration at the EU level due to nature of climate impacts where boundaries of impact are not confined to politically or administratively drawn lines. Attention at this level is important to ensure efforts are made to build capacities of the most disadvantaged regions. The role of the region is crucial in consequence of the regionally specific physical, social and economic factors which influence the severity of impacts as well as responsibilities of the region in providing utilities, emergency services and general disaster risk management.

Climatic impact to territorial development is likely to deepen already existing regional inequalities and produce a significant challenge to progress for competitiveness and general Cohesion Policy, especially with respect to the solidarity principle with respect to most disadvantaged regions. This demands that more attention be paid to how Cohesion Policy will address this challenge and how this combines with effects of existing demographic changes. The project estimates that this could expand the wealth gap in areas where greater change is expected. Attention is additionally needed for the peripheral regions that face additional challenges due to rising energy costs and substantial commuting. Policy should also

consider what is termed ‘carbon leakage’ where high emitter industries avoid costs imposed by one region by relocating to another. It is suggested that, in order to balance territorial development, climate change issues must be integrated within rural development policy. Another important consideration is the potential development opportunity for regions which rely heavily on seasonally dependent sectors including forestry, agriculture, and especially tourism. These regions face challenges especially at the local level in terms of EU policy implementation.

Through observations from discussion within the 2011 EPSON Internal Seminar, it is revealed that there are some additional challenges to implementing the Europe 2020 Strategy which must be addressed. Discussion greatly emphasized that there exists a need for flexibility in translation of objectives and targets especially at local levels because targets in their current form are unrealistic or undesirable for some regions (e.g. property rights for pre-existing settlement). Further, priorities need to be set at the regional level in order to ensure successful climate change strategy implementation especially with respect to territorial development. According to representatives of the Polish Presidency, this particular Presidency has stressed the importance of the role of spatial planning and the need for spatially specific strategies as well as the need for more local input in strategy development. This sentiment is echoed in the emphasis placed on analysis of the spatial, or place-based, context within the ESPON Climate project and is seen as an important component toward achieving the 2020 Strategy goals and implementation of current Cohesion Policy.

### **3. Conclusions**

A number of observations, estimations and recommendations have been produced as a result of the ESPON Climate project analysis. These products stress that implementation of strategies must encourage regional and more local level involvement and multi-level governance for effective implementation. They further emphasise that the current trends indicated demonstrate a path for European regions which is contradictory to the goals of territorial cohesion and that taking preventative and precautionary actions now save substantial future costs. The analyses and understanding produced from the ESPON Climate and like projects assists in creation of tailor-made strategies which will be crucial in overcoming present and future challenges to territorial cohesion and contributes in the efforts toward harmonious development of the European regions.

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