"One day we must come to see that peace is not merely a distant goal that we seek, but that it is a means by which we arrive at that goal. We must pursue peaceful ends through peaceful means."

- Rev. Dr. Martin Luther King, Jr.

CHOREOGRAPHIC BORDERS

A PROGRESSIVE STRATEGY TO ACTIVATE CROSS-BORDER DEVELOPMENTS AROUND KOREA DMZ BORDER REGIONS

Master Thesis
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JUNE 2015
CHOREOGRAPHIC BORDERS!
A progressive strategy to activate cross-border developments around Korea DMZ border regions

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PREFACE

This master thesis “Choreographic borders” contains the progress of graduation project started from September 2014. The graduation project was supervised by the laboratory of Metropolitan structures research group at Technical University Delft, Faculty of Architecture, department of Urbanism. The thesis contains the result of ongoing research in literature and practice through different scales and aspects on cross-border developments, to be able to understand the challenges and requirements of today’s border issues, and finally to suggest spatial planning and design strategy for peaceful border conditions tomorrow.

I hope this suggestion could provide another perspectives of lessening ongoing conflicts on the other border regions through the urbanism. My personal fascination on this subject led me to suggest the spectrum of progressive strategy as time and border conditions change. Korea where I came from is still under the war, only “ceased” which means peace has not yet been achieved yet. Our grand parent’s generations went through the war, and my parent’s generations had experienced a great urban expansion and growth; however relieving the tension between two Korea has not been improved a lot since 60 years of division. I do believe one of our responsibility in this generation is to think about the possibility to improve the relationship between two Korea, regardless of political and military rivalry. In this sense, working on the area of my cultural background helped me to think about my root and history in objective way, from help of my mentors and University.

I thank my mentors, of all accepted me to work on this great project without any doubts: first Prof. Vincent Nadán, who always shared warm and critical discussions with me, Dasen Zandbelt, who brought nice inspirations and cheered me whenever I had difficulties on this ambitious vision, and finally Diego Sepulveda, who supported and devoted extra efforts on this project with care. Also I send thanks to my teachers from Bachelor Seok Jung Lee, Jong Hyun Choi, and Knud Joshua Ehm, who always cared and taught me in thoughtful minds.

I thank my friends especially my boyfriend Kyoungho, and my friend Songya who always gave honest and sharp comments with affection, and my parents who sent me endless love and trust from far distance.

Jun 2015, Delft
MJ Kim
Abstract

This project is to suggest a sustainable and comprehensive development plan and a design strategy for the cross-border area between North and South Korea. Creating mutual benefits of ecological, social, economical and political conditions will facilitate balanced development for local residents in border area preserving its identity, meet the demand of recreational and cross-border activities, and bring adequate management for natural preservation.

By conveying research of border theory in urbanism and case studies, it gives a relative parameter to compare Korean border with other cases, illuminates different strategic approaches conducted by each progress in cross-border development, and it helps to understand the relationship between planning and its procedures provides delicate tools and manners to read complex conditions on border regions. When applying the theory into design, case studies are used as a part of progressive strategic plan, with scenarios analysis in Korean context. Also they are used to build the strategy followed by process of cross-border development, illustrated with design proposal. This also helps to expand the idea of possible stakeholders, actions and operational plan for the project area. Moreover taking an investigation on cross-border governance system and applying critical ideas into Korean border regions show an interesting paradigm of creating a future relationship between North and South Korea.
국문 초록

본 논문은 남북한의 통일은 DMZ 지역에 지속가능하고 상호 협력적인 접근 개발을 위한 통합적 도시 개발 및 디자인 전략을 제시하는 데 그 목적이 있다. 환경적, 사회적, 경제적, 역사적, 정치적 요소들이تكامل 상호 이익을 도모하여 체계, 조성 및 관리 공동 개발 수요의 연계과 성행, 접근 지역 고유 문화의 유지, 보존, 개발의 압박 속에서 DMZ 고유의 생태적 가치 보존을 기능하하는 관리 방안을 함께 고안하고자 하였다.

연구의 목표를 이루기 위해 도시공간계획적 측면에서 이루어진 접근성에 관한 이론 및 연구들을 조사하고, 이를 통해 조국적 접근성 공동 개발의 시례와 비교, 반영하였다. 연구과정을 통해 한국의 접근성과 다르거나 유사한 모델을 비교 분석할 수 있는 상세적 기준을 마련하고, 접근성 개발의 발전 상황에 따라 행해지는 각 전략적 접근들을 파악하여 단계별 연구사항을 마련함으로써, 각 사례들간의 계획을 실행 과정의 이해를 통해 접근성의 복잡성을 파악할 수 있는 방향을 구축하였다.

이론적 고찰을 통해 상용적인 조국적 접근성 개발을 위한 도시계획적 측면에서의 접근성 실효적 분석을 제시하고, 이는 한국 접근성의 실제 공간적 환경, 접근 시설적 관계, 접근성 개발 관련 기여판단의 분석 및 적용을 통해 구체화된 다. 구체화된 구성의 원칙의 민주 개발 사회적 공간의 공간 디자인을 통해 임종적 사례로 제시한다. 이러한 전략 구축 과정을 통해 개발 과정에서 임어야 할 않는 개입 가능한 이해당사자, 행동 사례, 실형 도시 개발과 같은 구성을 기반 사회성의 행복화와 함께 확립할 수 있다.

본 조국적 접근성 개발 연구를 통한 DMZ 남북의 통합 관리 방안 제안이 미래 남북한 관계에 기여할 수 있는 제안 중 하나가 될 수 있기를 희망한다.
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1. INTRODUCTION

Korean DMZ is a border located on 38th parallel between [Republic of Korea] and [Democratic People's Republic of Korea]. Since the Second World War and Korean War, Korea has been divided into two parts. This border is determined since 1953, 27th of July, based on [Korean Armistice Agreement].

This line represents two different ideologies -Socialism and Democracy- and regimes -Communism and Capitalism-. 
DMZ is a zone that has 2km width of buffer to each side from River mouth of Imjin River to Cosungpo, total length of 248km. The size of the area is 907Km², almost 1/250 land of Korean Peninsula.

Several border zones exist between two nations, from DMZ, CCL, Tour-prohibited Zone to Border regions.

Figure 1.1 DMZ Border condition

Border regions in Korea consist of five lines, creating borderlands in between. Each has different levels of accessibility.
SHIFTING BORDERS
: ACTIVATING CROSS-BORDER DEVELOPMENTS AROUND KOREA DMZ BORDER REGIONS THROUGH THE NATURE

1.1 PROJECT MOTIVATION

GLOBALIZATION AND BORDER
Since the disappearance of the iron curtain in the 1990s, globalization had been fostered. Mover and shaker of diversity within the city started to grow. Changes in market system have brought much influx of immigrants and goods from other countries adding more sociocultural, economic diversity. By globalization, both potentials and tensions of modern life in the city have been increased, urging for urban planners to treat these new trends as a part of complexity. With this globalization trend, boundary of borders has been diminished especially around less tension remaining countries, allowing more and more people to communicate from one side to other. Before then, and still now some countries with conflict remains, border regions have been neglected from development due to its military and political reasons. While globalization impacted upon state borders (...) they became more porous. It has also produced “...more rather than fewer borders and has increased rather than decreased their complexity” (Popescu, 2012, p.154). Borders are therefore complex spatial and social phenomena which are not static or invariable but which must be understood as highly dynamic (Grundy-Warr and Schlofield 2000; Kolossos 2000; Newman 2008; Pask 2005, 2009, Walter, 2011).

KOREAN BORDER
In this sense, ‘Korean border’ is chosen as the graduation topic, due to its unique conditions of nature and geopolitical conflicts. Since two Korea has been separated in 1953, unique border conditions have created. Due to its prohibited access for human beings, border lands have become ecologically valuable space(figure 2). Endangered inland animals, plants and migrating birds are living on this stripe of land from east to west.
Meanwhile, the border region has been tested as a space for the cross-border developments. They were to seek for the possibility of interactive relationship between two Korea. From this reason Special Economic Zones and touristic districts has been constructed. However the results remain doubtful, due to political crisis. The motivation of the project starts from one question: How can we create a better border conditions that can bring more interactive relationship between two countries and keep natural values?

Figure 1.1.1 Chulwon (Myunggang plant) (철원현Untitled 3.jpg) in DMZ zone
Photograph by Sweany
http://blog.naver.com/Myunggangplant
Type=View&logNo=488341&url=

id=248336&regin=201211181559495
PHYSICAL BORDER: FENCE AND DEMARCATION LINE

Korean border consists of several layers. By each part, it has different level of permission on passing. The more it is closer to MDL (Military Demarcation Line), the more barriers it exist. DMZ (Demilitarized Zone) does not allow any access unless both parties are admitting, and number of people entering at a time is limited. CCZ (Civilian Control Zones) only allows people in the zone, including invited people from the village, or soldiers. Physical demarcation symbols such as posts, fences, observatory posts or guard post dominantly shows conflicting condition of its border. However these border work as buffer zone, that relieves tension between two nations. Based on agreement, each nation gains more security by setting a border.

MILITARY FACILITIES

Most of military facilities are located within CCZ. Certain areas are designated as military purpose use. These areas are not allowed except military use. Precise location is not known. The Joint Security Area (JSA) is the only point of the Joint Security Areas (JSAs) where North and South Korea stand face-to-face. The JSA is used by the two Koreas for diplomatic engagements and, until March 1991, was also the site of military negotiations between North Korea and the United Nations Command (UNC).
CCZ VILLAGES:

There are 9 villages in CCZ. They emerged since 1960s, with diverse backgrounds of origins. In 1972, Daeryeon and Tongil-chon first formed the village by returned soldiers and displaced people who lost chance to go back to their North Korean hometown, in 1960 Mahyoun1-ri by victims who lost their houses from storm and flood. In 2001, Haman-ri was created by returning refugees. Since villages were established, they faced difficulties of cultivating their land, sense of unsafeness from military conflicts, and limitations of access. Mines are still exist, which are expected to take more than 60 years to be removed.

Tourism: Observatory and DMZ Train

Tourism is emerging industries in border regions. Since 2000s, the government have been relaxing the regulation of development. With unification policy, tourism regarding previous military facilities such as observatory or camphor are partly renovated into tour sites. Trains are connecting from Seoul to two points of stations in CCZ: Dora-san and Baekhagol station.
POLITICAL INTERACTIONS

Political interactions held twice in 2000 and 2007. As a result, it stimulated economic and social interactions such as participation in sports events, separated family reunion, or cultural exchanges.

Proposals such as Trans-Korean Railway passing through Korean peninsula to Eurasia continent, DMZ Peace Park, Special Yellow-sea Peace Zone have been suggested in a larger context to relieve political tensions; however, consideration on how these plans could actually applied and operated on border regions is still required.

SPECIAL ECONOMIC ZONE IN NORTH KOREA

Although North Korea have been closed to outside of the world, recent decisions to recover from economic difficulties have lead their part of the land opened; Special Economic Zones or tourism industries(figure 5). Between two countries, there have been several agreements consented and SEZs operating near border regions.
Under the law of "Protection on Military Bases and Installations Act" and "Natural Environment Conservation Act", regulation of human activities and development constrained the growth of villages, fluent economic activity, causing social fragmentation and unstable condition due to military tensions.

Neglected CCZ villages

Barricaded mines

Irregularly laid mines have brought hazardous factor for people in villages to cultivate their daily lives and development of regions. It will cause natural destruction when it is to be removed. Statistics say it will take more than 600 years to remove all the bombs.

Property claims

When two Korea become unified, land ownership will cause chaotic arguments to be tackled. Future proposal should consider on this issue, to think on how this are going to affect on planning.

Military tension at border regions is a major problem that causes sense of insecure atmosphere. Since South Korea’s capital Seoul is located near both border regions of inland and sea land, about 80% of border regions’ forces are located near Seoul metropolitan regions.

Neglected and endangered

Emerging problems

Current sprawl development of border regions already have shown predictable problems that can happen in the future. Collisions such as military department’s against on development in security reasons, nature destruction from ecological disconnection, or destroying regional identity and culture of CCZ villages.
1.2 PROBLEM FIELD

SPECIAL ECONOMIC ZONES IN NORTH KOREA

Two SEZs near the border in North Korea have been operated since 2000s. However they stopped operating every time when two Koreas had political crisis. Companies from South Korea faced financial damages or tourists once were in danger. These projects are highly dependent on political circumstances. Also, Kaesong industrial district produces pollution around DMZ area. Because they constructed in short period, environmental assessment were less concerned.

• Vulnerability by political circumstance
• Natural destruction from industrial district

BORDER AREA SUPPORT ACT IN SOUTH KOREA

The emerging needs of management on border regions with unification policy and Improvement of COZ village people’s life brought “Border area support act” in 2010. However since the law activated, sprawl developments tend to be accelerated. Due to the overlap and collision among existing policies of government departments and planning proposals of local governments, conflicts are created:

First, due to the conflicts above and desire of development from local governments and residents, nature preservation is threatened in concerning level. Border area support act have relieved the regulation of land use, causing increase of real estate values and over reclamation into illegal agricultural use. Expansion of property development accelerated disconnection of ecological network, ruining natural habitats and resources for species.

Second, scattered proposals and planning of large park, tourism district less contain demands of local villages. This should be reconsidered whether local people gain actual benefits from these projects. If these developments only foster increase in land price, deterioration of original purpose -providing local benefits with preserving their cultures and identity - is unwiseable.

• Constraints of coherent planning
• Natural destruction
• Interruption of local identity and culture
• Sprawl developments

NEGLECTED FROM DEVELOPMENT AND LOW DENSITY OF POPULATION

Limited access of COZ regions in security reasons deepened the sense of physical, mental distance. Regulation of human activities and development constrained the growth of villages, fluent economic activity, causing social fragmentation and unstable condition due to military tensions.

Moreover limited access created naturally neglected area. Though the law states these regions as preservation area, it is more left and rural nature without systemic and sustainable management. This caused mountain slide, fire, and lack of data on ecological condition.

• Underdevelopment and low density of villages
• Social fragmentation and isolation
• Abandoned nature
BORDER REGION DEVELOPMENTS

Development process will be inevitable in the future, near future within Southem part and someday when border becomes more interactive. How can we define and transform the cross-border area in a sustainable way by taking account on existing values or constraints of political, environment, socio-cultural and economic contexts? Second, how can border region development contribute to facilitating interaction between North and South Korea? Finally, what kind of comprehensive and cooperative urban planning for border region is required be set to enable cross-border development? Based on these problems, it is important to think about a sustainable approach for the cities development in future by respecting the environment, social, culture and economic development.

This project is to suggest sustainable and comprehensive development plan and design for the cross-border area between North and South Korea. Creating mutual benefits of ecological, social, economical and political conditions will facilitate balanced development for local residents in border area preserving its identity, meet the demand of recreational and cross-border activities, and bring adequate management of natural development.

The objectives of the project are:

First, to find the role and possibility of cross-border developments in border regions

Second to suggest a plan and design frameworks that can activate a cross-border development

The posture is concived by taking action of current institutional failures, pursuing:

• New comprehensive strategies for synergistic points of development area combined with local culture and identity
• Defining the level of natural preservation area and ecological connection
• Cooperative procedures for collaborative planning among local residents and different governments
• Preparation for cross-border development connections, combined with North Korean border part for future scenarios

1.4 RESEARCH QUESTIONS

The theoretical and analytical framework will give answers to the following questions:

General question 1.
What are the theories and strategies that have been used or discussed to increase cross-border developments in different contexts?

General question 2.
What are the constraints and potentials of biophysical, sociocultural and economic conditions that can contribute to cross-border development in Korean border regions?

Main question.
How territorial cooperation mechanisms of planning and design can be applied to the Korean border to facilitate future cross-border developments that consider local communities and ecological values?

1.5 RELEVANCE

1. PUBLIC REFLECTION ON POSSIBLE FUTURE OF INTERACTIVE TWO-KOREA

This project will be a starting point based on social agreement and participation to experiment on peaceful and mutually-beneficial strategic use of border regions. Also, it can provide the public to consider a possibility of future interactive two-nations, more than regarding North Korea as a superficial society as we see on News or pictures (figure 8,9). How would our life be like if we have more chance to see them?

2. TRANS-BORDER AND PEOPLE’S LIFE

The worldwide phenomena of globalization have been changing people’s mind, that our life has no boundary anymore (figure 10). We see our friends and families from opposite side of the world through Internet, and sometimes participate on global events to outside of the country. In this sense, there is an urge for planners to reflect on shifting paradigms of life, including for those living on border regions, a cross-border plan that supports multi-disciplinary interactions with adjacent countries are required. This will open another possibilities to multiple social groups of people and individuals to lead their new, or more potential lives. For planners, it is also another dimension of experience, to coordinate planning in multi-scales and cross-national levels.

SCIENTIFIC RELEVANCE

• THEORY RESEARCH

By conveying research on border theory in urbanism and case studies, it gives first a relative parameter to compare Korean border with other cases. Second it illuminates different strategic approaches conducted by each progress in cross-border development. Third understanding the relationship between landscape and planning provides sensitive tools and manners to read natural and sociocultural elements on border regions. When developing these, case studies will be used as a part of progressive strategic plan, with scenarios analysis in Korean context.

There are some distances combining multi-disciplinary- social, economical, environmental approach of strategy in Korean Urban planning. Especially considering the fact that there is a demand in comprehensive and procedural development planning, this project can contribute proving a wider spectrum of Korean urbanism. Such major factors or stakeholders based on scenarios can reach the gap between strategy based governance and current studies of research and design that has been proposed to Korean border area. Through this project, I would like to demonstrate how these approach could affect actual spatial conditions, and also how the spatial demands could be converted into the process of constructing strategic governance.

Moreover taking an investigation on cross-border governance system and applying critical ideas into Korean border regions could show an interesting paradigm of creating a future relationship between North and South Korea (figure 10). More broadly, this collaborative multi-disciplinary approach could be applied to other border cases that are facing territorial conflicts.
1.8 METHODOLOGY

In the progress of setting a strategic planning, it is important to conduct a set of methods and techniques to achieve the main goal during the research and design process. The research and design process with comprehension, intervention, and actions and operability plan will follow as the chart.

I. COMPREHENSION

During the comprehension process, it is essential to understand the relationship between landscape and spatial planning in dynamic border space. To do so, the theoretical framework will mainly provide basic knowledge of theoretical background, by applying into case studies. Analytical framework will be another part of framework where actual Korean context is applied, according to the background that has been built from theoretical studies. Through this process, by comparing case studies and Korean context, major notions and findings of difference in landscape, mechanisms of institutional operations, or flexible cross-border approaches can be drawn.

THEORETICAL FRAMEWORK

This part is generally to understand what has been discussed in the field of border theory, specifically in urbanism field. Two theory of how to read border regions and methods on how to facilitate cross-border development will be introduced.

A. Border theory
   • Definition of border and border studies in Urbanism

B. Border condition
   • Degree of permeability
   • Decoding borders

C. Cross-border planning
   • Why and collaborate; Instruments and governance.
   • Rationales and Drivers for cross-border collaboration and assessment criteria.

D. Case studies

Through theoretical studies, methods and approach on 1. Reading the permeability and dynamics of border region 2. Understanding of cross-border planning will be applied in actual cases, to compare the variations of border conditions. Background of cross-border development, approaches that has undertaken impact of the regions will be explained. The case chosen for this studies are: Shenzhen-Hong Kong, East-West Germany and Sweden-Denmark border regions. The reason of this choice is first, they show different degrees and types of cross-border activities, second they are at different stages on cross-border development planning, and finally both are border of two nations.

ANALYTICAL FRAMEWORK

Analytical framework part is to understand the condition of Korean border and project area. Two main parts for analysis will be conducted; historical context and spatial condition. Obtained insight from case studies of theoretical analysis will be compared in this chapter. Interventions on planning point of view and natural preservation point of view are listed in the Appendix.

A. Historical context

Historical analysis requires answering how political factors, governmental policy of planning are implemented in Korean border. Geopolitical aspect is conducted as a background of this process. This part demands information from papers and report of proposals and planning, a field trip including acquisition of maps, data, and interviews.
   • Historical review
   • Chronological documentation on important events and maps of spatial changes are listed parallel to the analysis.
   • Policy and planning

Through analyzing several researches on existing planning, suggested proposals, developing projects, normative instruments applied for border regions are listed.

B. Spatial conditions

A comprehensive understanding of spatial quality on the border regions. Making maps of each criterion in multi-layers approach will be conducted regarding to: socio-cultural, biophysical and economical elements.
   • Economic

Understanding of economical flows and interactions between two nations, current network of infrastructure and land use within South border regions. Statistics, data from news or report will be used to document maps.
II. VISION & STRUCTURAL PLAN
From comprehension process, diagnosis of analysis are shown. Through this, objectives and vision of the project will be drawn. The area of design project with progressive strategy are suggested as follow.

A. VISION and GOALS: National scale
- Diagnosis & Position
- Goals & driver of this project
- Principles of the direction

B. STRUCTURAL PLAN: Regional scale
- Regional scale analyses
- Concept and structural plan
- Characteristics, quality and direction

III. STRATEGY & SCENARIOS
This part contains scenarios and strategy to illustrate actions and operability plan, and evaluation of the project and its objectives.

A. STRATEGY
Based on vision and structural plan, actions and toolbox are suggested to show progressive strategy. Following elements are to accomplish final objectives of the project:

- Agreement
- Top-down approach
- Bottom-up approach

B. SCENARIO
Consideration on actors involved through the process and major factors for future scenario are suggested in this part.

C. EVALUATION
Based on design interventions, review and evaluation on objectives are conducted.

- ECONOMIC
Economic synergy and sustainability through agreement on collaborative development

- SOCIO-CULTURAL
Specializing locally through dynamic border region plan by collaborative planning

- ENVIRONMENTAL
Collaborative management of ecological preservation and connection on border and two nations

1.7 SCOPE OF THE PROJECT
Scope of the project follows as figure 12. It contains the progresses of the project and criteria for analysis.

1.8 END PRODUCT
I. COMPREHENSION
A well structured historical, economical, socio-demographical, and environmental analysis of the spatial condition of border regions and Korea peninsula and the area of intervention. A set of maps with text reference, chronological diagrams and statistics shall be illustrated.

II. VISION & STRUCTURAL PLAN
A well suggested vision and clearly developed structural plan. The creation of a framework and process type of different collaborations will be shown. General framework of goals and directions to achieve vision and structural plan suggested.

III. STRATEGY & SCENARIOS
This part contains scenarios and strategy, evaluation of the project and its objectives to illustrate actions and operability plan. This will lead to show required actions. A list of uncertainties and recommendations based on layers of scenarios and strategies are suggested, to consider operability of strategy and design. A detailed urban regeneration strategy with long-term visions in the area or intervention, proposed in different phases. Recommendations from local scale intervention design and collaborative process will be reflected onto higher level of planning. An evaluation with reviewing objectives and the final results will be presented.
2. THEORETICAL FRAMEWORK

이론적 배경

They can be material or non-material and may appear in the form of a barbed-wire fence, a brick wall, a door, a heavily-armed border guard or as symbolic boundaries, that is, conceptual distinctions created by actors to categorize components of belonging and exclusion.

- Doris Wasti-Walter

Borders are therefore complex spatial and social phenomena which are not static or invariable but which must be understood as highly dynamic.

- Grundy-Warr and Schofield
THEORETICAL FRAMEWORK

BORDER THEORY
Sub Question 1: What are the elements of the border space and the reasons to start discussion on cross-border development in urbanism?

Sub Question 2: What are the challenges in cross-border development?

DEFINITION

BORDER CONDITION
Sub Question 3: What are the tools to read complex border conditions that enables to reflect into urban planning?

Sub Question 4: What are the requirements in the spatial planning that makes cross-border regions successful?

TOOLS

CROSS-BORDER PLANNING
Sub Question 5: How planners could evaluate the condition of sustainable cross-border development?

Requirements

Sub Question 6: What are the elements of the border space and the reasons to start discussion on cross-border development in urbanism?

ASSESSMENT

CASE STUDIES
Sub Question 6: What are the elements of the border space and the reasons to start discussion on cross-border development in urbanism?

Strategic

TERRITORIAL & SECTORAL COOPERATION PLANNING MECHANISM

“What are the constrains and potentials of biophysical, sociocultural and economic conditions that can contribute to cross-border development in Korean border regions?”

2. INTRODUCTION THEORETICAL FRAMEWORK

CROSS-BORDER DEVELOPMENT THEORY

This part is generally to understand what has been discussed in the field of border theory.

A. Border theory

Two sub questions are shown in this part.

• What are the elements of the border space and the reasons to start discussion on cross-border development in urbanism?

• What are the challenges in cross-border development?

Through this question, definition of border and border studies in Urbanism and challenges in the cross-border development will be explained.

B. Border condition

A sub question arose in this part is:

• What are the tools to read complex border conditions that enables to reflect into urban planning?

Through this, tools to measure and evaluate border conditions are found.

C. Cross-border planning

Two sub questions for this part are:

• What are the requirements in the spatial planning that makes cross-border regions successful?

• How planners could evaluate the condition of sustainable cross-border development?

To answer these questions, requirements and assessment criteria for cross-border development are explained.

CASE STUDIES

• What are the elements of the border space and the reasons to start discussion on cross-border development in urbanism?

To answer the question, theoretical studies, findings will be applied in actual cases to compare the variations of border conditions.

TERRITORIAL & SECTORAL COOPERATION PLANNING MECHANISM

Generic conclusions of theoretical studies are summarized and suggested as mechanism that could facilitate cross-border development successfully.
2.1 Border Theory

**Boundary**
Linear concept, demarcating one single facet.

Boundaries can be grouped into 4 categories:
- Geopolitical Boundaries
- Sociocultural Boundaries
- Economic Boundaries
- Biophysical Boundaries

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**Definition of Border**

According to the field of border studies in past two decades, the term “border” is often used synonymously with the term “boundary” and “frontier” (Anderson & O’Dowd, 1999; Hasselberger & Bennworth, 2011; Hasselberger, 2014). These terms describe a limit or a barrier and indicate a division or separation in space (Hasselberger, 2014). Their main significance derives from their importance in defining, classifying, communicating and controlling a territory, in the sense of assigning things to particular space and regulating cross-border movements and access into and/or out of specified areas (Sasse, 1988). Hasselberger describes the definition of boundary as a linear concept that demarcates one single facet. It consists of four categories: Geopolitical, Sociocultural, economic, and biophysical boundaries. Boundary sets of border, which is linear, hard, and static dividing element and frontier, which is zonal, soft, and fluid dividing element.

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**History of Border Discussion**

During the “Cold war” (1945-1991) difference in ideology sharply demarcated state border. In this period, border was characterized by a proliferation, consolidation and privileging of state borders by the doctrine of “national self-determination” (Anderson & O’Dowd, 1999). The collapse of the Iron curtain in 1990s created more borders due to reestablishment of some state borders long suppressed under Imperial region, or subsumed within federated structures (Hasselberger, 2014).

The process of capitalization and globalization were crucial incidents in emergence of border studies in multiple fields. While globalization impacted upon state borders (…) they became more porous, it has also produced “more rather than fewer borders and has increased rather than decreased their complexity” (Popescu, 2012, p.154). Borders are therefore complex spatial and social phenomena which are not static or invariable but which must be understood as highly dynamic (Grundy-Warr and Schofield 2005; Kolossov 2005; Newman 2006; Paasi 2005, 2009, Walter, 2011).

The idea of re-shaping border regions have made political and economic reasons to cooperate to each other. As a consequence of these trends, notions of “borderless world” and political “de-territorialization” are discussed in border theory among several scholars.
**CHALLENGES OF CROSS-BORDER DEVELOPMENT**

**INTER-SECTORAL VS INTER-TERITORIAL INTEGRATION**

It has only been few decades since the border issue has emerged in the field of urbanism. General topic of border in this field is still derived from the geopolitical issues however approaches are divergent by regional context. Some are highly conflicting, but some are in less and relaxed conditions. Moreover the general conditions of border regions, which had been neglected due to its location near the border, brought more reasons to be developed with cross-border activities. Those complicated conditions of border have brought urban planners a question: how can a border be planned to keep its locality and to bring new trans-nationality?

The need of cooperative management in trans-national level arose in 1990s. There have been many studies of cross-border region however difficulties remained to planners: to grasp spatial complexities that used to be perimeter of the land. Most of cross-border planning in recent decades was border opening-process, which focused on making the border more permeable, enabling flows of people, capital, and services. It addresses geopolitical aspects of the border to meet national/trans-national requirements. However such political-oriented “bordered” process fostered the difficulties of inter-sectoral and inter-territorial integration, represented in the space: the alignment of linear elements on the border landscape.

Therefore Haselberger mentions some advice when planners deal with border regions regarding the intrinsic of border space: “Borders are very much in flux and that their physical appearance changes both in space and time. On the one hand, planners work within pre-defined ‘bordered’ territories or components. On the other hand, planners confirm, shift, diminish and create borders when they allocate functions to spaces (zones). Borders are not just ‘visible lines’ in space or map, on the contrary, they are complex social constructions, with many meanings and functions. Planners are allowed to acknowledge nuanced or underestimated impacts on space and people.”

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**2.2 BORDER CONDITION**

To read dynamic and complex intrinsic of border space, two main theories are introduced. “Degree of transparency in border regions” by Martinez, and “Decoding borders process” by Haselberger.

A research done by Martinez in 1994 can be applied to investigating dynamics of border interactions according to its transparency. In categorizing borderlands it is essential to assess cross-border movement and the forces that produce it (Martinez, 1994). In this sense, Haselberger sees understanding the complexity of border region is a key process to set and reflect comprehensive planning for planners.

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**DEGREE OF PERMEABILITY**

To assess cross-border movement and the forces that produce movement, the author provides four schemes of borderlands based on the degree of interaction-transparency: Alienated borderlands, Co-existent borderlands, Interdependent borderlands, and integrated borderlands.

Alienated type is the border where crossing is non-existing due to the political, religious, nationalisms, ideological animosity, or ethnic rivalry. Those borders do not allow any type of human interactions, sometimes with physical boundaries. However natural landscape interacts regardless of human border.

Co-existent type allows limited access to cross the border. Bi-national development occurs when both governments have willing to use border regions in a strategic way. This is to relieve conflicts into manageable level. However physical and political boundary still remains.

Interdependent border type develops when “a border region in one nation is symbolically linked with the border region of an adjoining country” (Martinez, 1994). Development in border region is stimulated, under the favorable economic condition. The frequency of sharing goods, labor, or services from other side of border increases.

When a border becomes transparent integration of society, economic system occurs. People in a border region recognize themselves as a part of one social system and physically, one territory. There “re-territorialization” process evolves, creating two separated region into one new territory. Through this analysis, one can expect what is needed and required to shift to more transparency stage. It is the matter of time, and requirements to develop its status to next stage.
FOUR CATEGORIES OF DECODING BORDERS

According to the ‘Decoding borders’ process, the writer put emphasis on considering other geographical conditions-functional spaces-such as economic, biophysical socio-cultural boundaries as a part of important analysis factors for urban planners. Through this process, it will provide a means for planners: first, to ‘understand’ the ‘entire complexity’, second to help properly comprehend emerging planning challenges, and third to ‘identify variables which are at play in the concrete border region’.

<table>
<thead>
<tr>
<th>BORDER CATEGORY</th>
<th>BORDER-RELATED RELATIONAL GEOGRAPHIES</th>
<th>CLASSIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geopolitical boundaries</td>
<td>Political and administrative spaces</td>
<td>Hard spaces [Or constraints]</td>
</tr>
<tr>
<td></td>
<td>Functional spaces</td>
<td>Soft spaces</td>
</tr>
<tr>
<td></td>
<td>Environmental spaces</td>
<td>Fuzzy spaces</td>
</tr>
<tr>
<td>Sociocultural boundaries</td>
<td>Functional spaces</td>
<td>Soft spaces</td>
</tr>
<tr>
<td>Economic boundaries</td>
<td>Environmental spaces</td>
<td>Fuzzy spaces</td>
</tr>
<tr>
<td>Biophysical boundaries</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chart 2.2.1: Relational geographies according to border categories.
By Haselberger, 2014, Revised by Author

• STEP1. FROM BORDERS TO BORDERING PRACTICES
This stage gives a fundamental basis in understanding how the different functions and components work together to constantly create and diminish borders. According to the paper, it divides the layers into geopolitical, sociocultural, economic, and biophysical boundaries.

Each boundary has its function, framings and discourses illustrate border dynamics. When each layer is overlapped to each other, one can find conflicting or corresponding circumstances of border regions.

First category of boundary is geopolitical boundaries. They are “territorial and physical demarcation of a piece of land”. It divides and protects the territory by law, planning or physical boundaries. Second, sociocultural boundaries are the layer defined by functions such as group of communities, feeling of belonging, local culture or identity. Economic boundaries are defined by economical flows, management of economy, etc. Lastly, biophysical boundaries are defined as ‘natural of environmental features, fuzzy demarcated land based or marine habitats’. Transition of ecological systems, connection of the eco-system, or relationships among biotic agents are part of its major functions.

• STEP2. FROM BORDERING PRACTICES TO RELATIONAL GEOGRAPHIES
In second stage, an attention is drawn to the spatial impacts of boundaries on human and environmental activities. It helps planners to unravel all of the spatial dynamics derived from the various functional and environmental relational geographies at play. Following chart shows type and classification of each major function.

Borders function over time. It is important to understand how borders are producers, reproduced, justified, and tend to fix themselves in people’s mind. Therefore, planners should aware when they set up a cross border region or reunit a relational geography, trans-border should allow underlying border permeable and different kinds of soft spaces to emerge.

2.3 CROSS-BORDER DEVELOPMENT PLANNING

: OECD & EU SPATIAL PLANNING AND TERRITORIAL COOPERATION

After understanding the methods how to read border regions’ complexity, the next part is to comprehend how to facilitate or manage border regions. This part is from the series OECD reviews of “Regional Innovation” and “EU spatial planning and territorial cooperation” to address the demand by national regional governments for clarity on how to strengthen the innovation capacity of regions. Among several methods and requirements, three aspects are selected by author: Why and collaborate, Instruments and governance, Rationales and Drivers for cross-border collaboration and assessment criteria.

<table>
<thead>
<tr>
<th>ECONOMIC ASPECT</th>
<th>DRIVER</th>
<th>EXPLANATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical mass</td>
<td>Labor markets access to knowledge networks to increase critical mass</td>
<td></td>
</tr>
<tr>
<td>Political power</td>
<td>Increase the recognition of areas of strength in regions</td>
<td></td>
</tr>
<tr>
<td>Specialized services</td>
<td>Innovation support services can be more specialized and higher quality</td>
<td></td>
</tr>
<tr>
<td>Economies of scope</td>
<td>Complementarities</td>
<td>Build on a diversity of assets in terms of research, technology and economic base</td>
</tr>
<tr>
<td>Regional identity</td>
<td>Increase intrinsic recognition for integration and social capital</td>
<td></td>
</tr>
<tr>
<td>Regional branding</td>
<td>Attractiveness and recognition to firms and invited labor</td>
<td></td>
</tr>
<tr>
<td>Specialized infrastructure</td>
<td>Shared science and technology facilities reduce costs and risks</td>
<td></td>
</tr>
<tr>
<td>Public and club goods</td>
<td>Border challenges</td>
<td>Day-to-day issues with flows of people, goods and services</td>
</tr>
</tbody>
</table>

Why Collaborate: Aim

According to the OECD document, several conditions are suggested why collaborate among different nations.

• ACTING BEYOND BORDERS
Valuable partners may be located nearby, but simply on the other side of a national border where they are less likely to know each other, and they are more likely to experience additional obstacles to working together.

• BORDERS AS BRIDGES
Working cross-border can be a bridge that complements other global interactions. Innovating with a cross-border partner requires a degree of openness, which can be a first step towards internationalization.

• BORDERS AS OPPORTUNITIES
Some regions seek to address the positive or negative externalities that cross the border, be that the benefits of a science facility for industry in the other region or tax arrangements to compensate for service use due to cross-border commuting. Another rationales reinforce regional efforts to overcome peripherality.

Rationales and Drivers for Cross-Border Collaboration

Major drivers for collaboration are following as chart. Economies of scale such as critical mass, political power, or specialized services increase larger labor markets with agglomeration in economies or recognition of areas of strength in regions. Complementarities of building on a diverse related assets supplies chain images. Public and club goods such as regional identity, regional branding or specialized infrastructure bring greater integration and social capital in or out of the cross-border regions, and reduce financial costs and risks. Border challenges such as flows of people, goods and services result in both positive and negative spillovers.
THE SYSTEM OF CROSS-BORDER COOPERATION

According to Ogneva, "ideas in cross-border cooperation are the direction, a way of further development of cooperation between regions which cover economic, political, cultural, ecologic and other spheres." The author introduces the system of cross-border cooperation system, which shows six elements of the cooperation mechanisms. First, subjects (actors) who participate in the development, objects (objects), where the cross-border development held, principles (methods), how they reach the development in financial, social aspects, functions (goals) that the development aims for, and last objectives of cross-border cooperation, the reasons to cooperative inter-territory or inter-sectoral way. This helps to understand important key aspects on the cross-border development stages.

Cross-border cooperation makes active different forms of interaction as between countries and their regions. Therefore, it is important to pay particular attention to the organizational aspects.

Next to the introduction of instruments in trans-border planning in EU, recommendation on facilitating cross-border instruments are suggested by OECD:

KEY RECOMMENDATIONS TO MAKE CROSS-BORDER INSTRUMENTS WORK

- Devote more efforts to strategy development and policy intelligence
- Mainstream the cross-border element in national and regional innovation strategies and policy instruments, or at least align program rules
- Make greater use of opportunities created by the border
- Publicize success stories of cross-border instruments

ASSESSMENT CRITERIA: Checklist of conditions for a favorable environment for cross-border regional innovation

An assessment of different factors in cross-border area can provide evidence whether there is strong potential for cross-border action. According to OECD document, those factors are consists of framework conditions, innovation system conditions, and governance and policy context. Framework conditions such as geographic accessibility, socio-cultural proximity, institutional context conditions or cross-border integration define functional cross-border areas in a traditional manner. They provide favorable conditions for collaborative activities. Innovation conditions include the balanced potential and related variety of systems on both sides of the border to create mutual benefits in partnership.
THEORETICAL FRAMEWORK

BORDER THEORY

DEFINITION

BORDER
- Demarcates one single area
- Linear, hard, static dividing element
- Discussion started after Cold war for political and economic reasons

CHALLENGES
- Locality vs Globalization
- Challenges in local vs.
- Intersectional vs Inter-Territorial integration
- Challenges in cooperative planning

BORDER CONDITION

TOOLS

RESIDING BORDERS
- Geopolitical
- Functional
- Economic
- Administrative

DEGREE OF PERMANENCY
- Status of cross-border activities
- Associated
- Co-operated
- Interdependent
- Integrated

CROSS-BORDER PLANNING

REQUIREMENTS

AIM
- Acting beyond borders
- Borders as facilitators
- Borders as opportunities

DRIVERS
- Economic of scale
- Economic of access
- Public and sub-grade
- Governance

SYSTEM
- To achieve certain aims in cooperation
- Following system are required in different scale & sectors
- Subject: Who
- Dynamic: What
- Impact: How
- Function: Why

ASSESSMENT

CRITERIA FOR SUSTAINABLE CROSS BORDERS
- Framework validation
- Innovation system conditions
- Governance and policy context

CONCLUSION

Borders vary by its transparency and different layers. The more interactions between nations occur, the more complicated conditions it prevails. Border region is the area where dynamics of elements can explicitly conflict when it is developed. Therefore, a sensitive approach corresponding with deep comprehension on its complexity is demanded, to prevent undesirable results: such as sprawl development or environmental destruction.

Border condition is dynamic enough within one territory; however, it becomes even complex when two or more of countries try to manage different borders into coherent way. Cross-border development can bring additional benefits on geopolitical aspects such as relieving the tension or boosting economic synergies to adjacent nations.

When cooperative policy and planning process starts, direction tends to convey from national level to local municipality. As process evolves and border condition improves, potential of local actors’ participation emerges, reflecting its own context within the region. Then collaborative planning nation-to-nation (top-down) and local-to-local (bottom-up) approaches cross fies. EU spatial planning shows possibility of cooperative process of bottom-up and top-down approach, by suggesting communicative instruments of visions, strategies and scenarios. It helps actors to have coherent direction, but still flexible and opened by changing situation and different levels of participations.

Therefore, it is important to understand the reasons behind the collaboration, possible potentials and communicative instruments that facilitate cross-border spatial development. Urban planner should foresee the possible aftermath that cross-border planning could foster: creation of once separated domain into one region, as a ‘re-territorialization process’. During this process cooperative instrument is required to bring synergies between two countries in a larger context, also to improve local desires of social, economic, or ecological interactions.

Chart 2.3.5 Conclusion theoretical framework by author
2.4 CASE STUDIES

INNER GERMANY

Border Regions:
- Post-border regions development after Germany re-unified in 1989
- Environmental preservation
- Grünes Bündnis: 177 km², 130 km²

SWEDEN-DENMARK

Border Regions:
- Cross-border development since 1990s
- Socio-cultural activation
- Copenhagen-Malmö Metropolitan
- Øresund: 21,000 km²

SHENZHEN-HONGKONG

Border Regions:
- Cross-border development since China open to market in 1980s
- Economic development
- Shenzhen Special Economic Zone: 315 km²

To apply and compare actual contacts in cross-border developments, three cases are selected: Inner Germany, Shenzhen-Hong Kong, Sweden-Denmark border regions. Each region is in different stage of cross-border activity, however all of them have/had political and ideological conflict since Cold War periods. Border region development brought relieving tensions and economic benefit to both countries.

Figure 2.4.1 Introduction case studies. By author

* See appendix for details of studies.
**DEGREE OF PERMEABILITY**

2.5. Co-existent to interdependent border lands.
- National development stimulated
- Checking points still remain
- Share goods, services and labor

3.5. Interdependent to integrated border lands.
- INTERREG program by EU
- Integration of society
- Economy, law system different
  - "Oresund Region"

4.5. Integrated to united border lands.
- Expand to European green belt
- No limit of movement
- Integrated social, economic system
  - "Grenze Bund"

**DEVELOPMENT STAGE**

- **1980**
  - Shenzhen - Hong Kong
  - China open to market (1978)
  - Special Economic Zone
  - Spatial plan 2020

- **1990**
  - Sweden - Denmark
  - Oresund Bridge (1992)
  - Copenhagen (1992)

- **2002**
  - East - West Germany
  - West border region's support
  - Germany Reunification (1990)
  - Grenze Band (1992)
  - European Green Belt (2000)

**CRITERIA FOR COMPARISON**

- Economic development
- Sociocultural integration
- Biophysical effect
- Strategy

**Figure 2.4.2** Applying Martinez's Theory into cases. By author

**Figure 2.4.3** (Above) History cross-border development. By author

**Figure 2.4.4** (Below) Comparison tools. By author
OUTLINE OF CONDITIONS & BACKGROUND OF DEVELOPMENT

SHENZHEN-HONGKONG BORDER REGIONS

MAIN AREA: SHENZHEN SEZ
POPULATION DENSITY: 15.6 million (45% HK, 55% SZ)
MAJOR PROVINCE: Quian, Guanming, Pinghan

KEY WORDS OF DEVELOPMENT:
New towns, Social fragmentation, Rural/abandoned nature, Buffer zone

Aims and challenges: BORDERS AS OPPORTUNITIES
Since China open to the market in 1979, China designated 5 major Special Economic Zones(SEZ). Shenzhen was one of SEZs. This region became more important since Hong Kong returned to China in 1997. To prepare unification between two nations by 2047, this border region faces crucial challenges: to bring not only economic synergies but also integration of two nations for the future.

DENMARK-SWEDEN BORDER REGIONS

MAIN AREA: ORESUND
POPULATION DENSITY: 3.8 million (87% DM, 53% SD)
MAJOR PROVINCE: Zealand(Copenhagen), Scania(Malmö, Lund)

KEY WORDS OF DEVELOPMENT:
Focused economy, Social flows in and out, Baltic sea ecology management, Firing network

Aims and challenges: BORDERS AS BRIDGES
Two major factors happened during 1990s brought two nations to cooperate: Sweden's EU joint and Economic crisis. Post Soviet Union countries joined EU during 1990s and 2000s, to pursue political and economic stabilities in Baltic sea regions. Sweden also joined EU during this period. With this condition, economic crisis in 1990s stimulated two countries to develop Oresund, to compete among Northern European regions.

INNER GERMANY BORDER REGIONS:

MAIN AREA: G ores Band
POPULATION DENSITY:
MAJOR PROVINCE: 6 Federal state, 39 administrative districts

KEY WORDS OF DEVELOPMENT:
Balanced development, Social migration, nature preservation, Linear development

Aims and challenges: ACTING BEYOND BORDERS
Reunification(1999) brought border region development. Border supportive policy exist during two nations divided, however integrative plan applied after 1989. When the border opened, ecology organization such as Bond Naturschutz(BUNDS) initiated movements to preserve green network of border lands. Also developments around border regions were crucial purpose for balanced East and West Germany.
### COMPARISON CASE STUDIES

<table>
<thead>
<tr>
<th>STRATEGY</th>
<th>□ Fortressed Zone</th>
<th>□ Ring</th>
<th>O Linear</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONDITIONS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic development</td>
<td>Critical mass</td>
<td>+ + + +</td>
<td></td>
</tr>
<tr>
<td>Socio-cultural integrator</td>
<td>+</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Biophysical Effect</td>
<td>+ 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governance</td>
<td>Less participants and flexible</td>
<td>Øresund committee &amp; Interreg</td>
<td>Provinces, NGOs actively involved</td>
</tr>
</tbody>
</table>

| DRIVERS & INSTRUMENTS | Shenzhen chose economic development as a main driver. Through Special Economic Zone, they fostered cross-border development around Shenzhen regions. The planning for this case tends to have less flexible since there are less participants in the planning procedure. However, the governance stimulates competition among local governments, fostering multiple industrial and creative industries. | Øresund succeeded to create a one cross-border region around Copenhagen and Malmö, that has regional identity. To make it successful, they fostered socio-cultural integration activities from local participants through Øresund committee. Interreg supports cross-border developments, which accelerates optimistic effects. Complementary industries and educational functions are shared which brings synergies. | Inter-Germany border regions went through cross-border development after the unification. Ecological values along the border regions were used as a major driver for cross-border activities. To activate green belt project, province and NGO involved supported by EU and federal governments. This project is now expanded to European continent, that shows iron curtain border lines. |
2.5 CONCLUSION

FOUR STEPS TO ACTIVATE CROSS-BORDER DEVELOPMENT

Considering the fact that a border region development aims to facilitate rural and neglected areas into internationally compatible region, urban planning poses the strategy of both top-down approach in national/trans-national levels and bottom-up initiatives in a local level to fulfill both the local demand and the nation’s vision. In this sense understanding the mechanisms of cross-border development process could help urban designers and planners to broaden their perspective of complex issues that modern era is facing and to find the possibility of having balance between top-down and bottom-up approaches. In the following paragraphs, mainly four processes to activate cross border developments are introduced with theories and examples. Although these processes mentioned above are generalized to illustrate the urban planner’s approach on border regions, each process is an important aspect for a successful border development. These processes could have different orders or orientation of values under its own circumstances.

I. TOP-DOWN
Political agreement

II. BOTTOM-UP
Border region development

III. SYSTEM & IDENTITY
Integration of regions

IV. EXPANSION OF IMPACT
Coexistence relationship

1. SETTING AGREEMENTS AND DEVELOPMENT PLAN: TOP DOWN

To activate cross-border developments, multiple countries should accord on developments on the location of core regions and networks to create, and set major economic drivers and frameworks. Sometimes those supports are provided by trans-national organizations such as the EU, or the national governments involving. To activate cross border developments, a top-down approach of setting a strategies and frameworks in a national level are essential. Since these regions have been neglected and less developed, they require proper infrastructure and access to public goods and services to major networks.

Important criteria for achieving this process successful are following: Frameworks with geographical accessibility, sociocultural proximity, institutional conditions and cross-border integration.

In the case of Shenzhen Special Economic Zone between the border of Hong Kong and China, they strongly emphasize on providing major traffic infrastructures from Hong Kong to inland China, to facilitate economic benefits around the Shenzhen region. Still checkpoints and physical borders are maintained but this allows more flow of people to commute from one side to the other. Through this development, the Chinese part provides labors and market while Shenzhen provides technologies and advanced industries, which creates a complementary relationship that brings mutual benefits. This was possible because the two governments provided crucial infrastructures based on agreements.

2. MOTIVATION AND LOCAL IDENTITY: BOTTOM UP

When core services and foundation is set, local actors of NGOs, municipality, citizens or private sectors become the main initiates in the developing procedure, to recreate and reinforce their local culture, economy and sociocultural system. Considering the actual benefits in development process, giving a key role and the motivation to local municipalities and actors for the local level development is crucial.

Through this, they make an agreement among regions for mutual interests and set common values. Advice and ideas on how to foster synergies among complementary, specialized industries and resources are suggested and shared.

Local parties can initiate multiple projects with the help from the municipalities. These initiatives get subsidies from trans-national organizations, national governments or local municipalities to make the project successful. Important criteria for achieving this process successfully are the following: Systems for innovative specialized economies, business model, knowledge infrastructure, and interactions within systems.

In case of Oresund region they organized a platform called “Oresund Committee” managed by local municipalities. Their role was to provide a communicative platform by bringing all the multiple actors of NGOs, local citizens, private investors, and governments together to share the idea and support regional developments. Through this committee, local municipalities gained the authority of major decision-making process. Moreover, local cultural organizations fostered diverse social activities in the regions, to enhance their local identity.

3. BORDER REGION AS ONE SYSTEM

When two processes, top down and bottom up, evolve coherently and effectively border regions obtain a self-sustainable mechanism that operates the region as a whole.

This indicates an agglomeration among multiple communities, which is complementary to each other.

For instance, one side might have resources such as education and job market and the other side might have resources of labors and technical industries. The labor force from one side can supplement the job market on the other side while education could provide R&D joint cooperation to improve technical industries. They can be exceptional from each country to bring more people in to the border regions, or remain the same to let people and companies take advantage of different regulations.

4. EXPANSION OF ITS IMPACT

Border region is the area where dynamic elements can explicitly conflict during its development. Therefore sensitive approach corresponding with deep comprehension on its complexity is demanded, to prevent undesirable results such as sprawl development or environmental destruction. Cross-border development can bring additional benefits on geopolitical aspects such as relieving the tension or boosting economic synergies to the adjacent nations.

Therefore it is important to understand the reasons behind the collaboration, possible potentials and communicative instruments that facilitate cross-border spatial development.
At the same time, urban planners should understand the proximity of uncertainty that cross-border planning could affect other regions and nations.

**Reflecting on the Korean Context**

Four steps of activating cross-border development show crucial criteria that should fulfill to run the border regions sustainable and successful way.

There I would like to reflect these steps onto Korean context, to activate cross-border development sustainable.

To do so, diagnosis of actual context is required. In the first part, the main focus is to understand the changes of the border space and the relationship between two countries through the history and spatial analysis. Through this, one could understand constrains and potentials of the border regions and think on what could bring common and sustainable agreements.

This will help to set a desirable future with vision. Detailed strategy and design interventions are going to be shown to find the mutual agreements that could bring local participants and natural values in the planning procedure. They will be referring to the four steps of activating cross-border developments.

At the same time, urban planners should understand the proximity of uncertainty that cross-border planning could affect other regions and nations.
3. INTRODUCTION ANALYTICAL FRAMEWORK

Analytical framework part is to understand the condition of Korean border and project area. Two main parts for analysis will be conducted based on the tools of degree of permeability and decoding borders. Obtained insight from theoretical analysis will be compared in this chapter. Historical review, planning system and spatial condition will be analyzed.

HISTORICAL REVIEW

Historical review are to evaluate fluid conditions in permeability of borders by time. It is to answer the question of:
- How have the degree of the permeability in Korea changed?

PLANNING SYSTEM IN SOUTH KOREAN BORDER SIDE

- How have the planning and policy on border regions affected the degree of the permeability in Korea?
  - Through analyzing existing planning, suggested proposals, developing projects, normative instruments applied for border regions are listed to answer the question.

SPATIAL CONDITIONS

- How is the spatial condition of the border?
  - To answer the question, a comprehensive understanding of spatial quality on the border regions are conducted in this part. Spatial condition on economic, biophysical and sociocultural aspects on the border regions are shown.

DIAGNOSIS

- What are the Potential and Constraints of the Korean border regions?
  - From analysis, potential & constraints of the border regions will be diagnosed, to set objectives and vision in the next chapter.
1. Alienated borderlands

Two layers of border:
- DMZ
- CCZ

Limited economic activities:
- Kaesung SEZ
- Nature

Crossing at official checkpoints:
- Shenzhen SEZ
- New towns and Agriculture

Collaborative economic activities:
- Euroregion Meuse-Rhine
- City to city network

2. Co-existent borderlands

3. Interdependent borderlands

4. Integrated borderlands

---

1945: Independent Korea

1948: 1st Republic
1960-1962: 3rd Republic
1979-1980: 5th Republic
1986: 6th Republic
1998: 7th Declaration

Kaesung SEZ
Kumgang Tourism
KyungUi Railway
KyungWon Railway

Border region plan
1948: 1st Republic
1960-1962: 3rd Republic
1979-1980: 5th Republic
1986: 6th Republic
1998: 7th Declaration

Kaesung SEZ
Kumgang Tourism
KyungUi Railway
KyungWon Railway

Border region plan
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1986: 6th Republic
1998: 7th Declaration

Kaesung SEZ
Kumgang Tourism
KyungUi Railway
KyungWon Railway

Border region plan
3.1 HISTORICAL REVIEW

In 1945, Japanese empire surrendered to Allied forces from the second World War. Due to this Korea got independence however this didn’t last long. Soviet union and US armies occupied North and South of Korea based on 38 parallel line and military government period started. In Southern side, capitalism state “Republic of Korea” established under the aid of United States of America and in Northern side, communism state “Democratic People’s Republic of Korea” established under the aid of Soviet Union.

In 1950 25th of June, Korean War broke out and this 38parallel border shifted continuously during the war period. In 1953 both countries finally decided to stop the war and fix the border line. Under the supervise of UN, cease-fire activated at Panmunjom by each parties signing on “Korean Armistice agreement”. It was designed to “insure a complete cessation of hostilities and of all acts of armed force in Korea until a final peacefull settlement is achieved”. Based on this agreement, demarcation line has been set under 38 parallel line and geographical conditions. Demilitarized Zone(DMZ) has been set to have buffer of the border. It was originally 4km width from the demarcation line.

1970S-1980S: HOSTILE COMPETITION
TOUR PROHIBITED ZONE AND CIVILIZED CONTROL ZONE

After Korean War ceased each country began to compete. Different planning system is applied to each border region. Secondary buffer to DMZ is a good example of these differences. For Northern side, it is called “Tour Prohibited Zone”(-DMZ). For South Korea it was due to “Protection on Military Bases and Installation Act” which activated in 1972, that determines military use in CCL area and the line CCL. During this period, propogandas of each governmental system is promoted. In DMZ near Panmunjom both countries allowed to build one villages each. They were Daesungsung freedom village(925-10-19) in north side and Gijungdong peace village(925-10-19) in north side, to promote each countries’ system and ideology.

In 1983 the limit of CCL became legislated 20 to 40 kilometers from military demarcation line. Villages situated up to 112 places in 1985 however to relieve the demands of development in CCL, the government moved the line three times in 1993, 1997 and 2008.
1980s-2000s: HOSTILE COOPERATION
SPECIAL ECONOMIC ZONE AND
INTER-KOREAN EXCHANGE AND COOPERATION ACT

The relationships between two nations have become less tense as each president had joint meetings. They were 6.15 and in 10.4 declaration in 2000 and 2007, which helped both countries to cooperate in peaceful and economic way. Inter-Korean Exchange and Cooperation Act was an actual law that enabled two countries to work together.

It was partly due to the shifted geopolitical relationship which affected North Korea’s policy line, to be more closed within reinforced dictatorship. Eventually this led them to face the economic crisis with pressure of globalization and collapse of their regime. Its economic scale reaches 5838 GDP per capita, which is almost 40 times less than South Korea based on national income listed by UN in 2012(GDP/GPP per capita Field listing, 2014).

The economic pressures demanded North Korea to bring more introduction of foreign capital. This brought North Korea to partly open their gate to global world, which is called “Special Economic Zone”(Special Economic Zone in North Korea, 2013).

They have a number of SEZs and Special Administrative Regions, where foreign companies can operate with tax and tariff incentives while North Korea gain access to improved technology. The Kaesong Industrial Region is a special economic zone where more than 102 South Korean companies employ 52,000 North Korean workers.

2000s-2015: PEACEFUL Co-EXISTENCE?
TRANS-KOREAN RAILWAY AND PEACE PARK

There, minimal economic open policy of North Korea increased the possibility of interaction between North and South Korea. Several proposals to enhance social, economic interaction with North Korea are partly realized or suggested since 90s(Min, 2014). Most of them are focused on economic activities such as “Trans-Korean Railway(TKR)”, that is to build railway infrastructure in Korean peninsula allowing rail freight to travel from South Korea to North Korea, China and Russia eventually to Europe, or the extension of highway between North and South Korea are quite recent proposals. Other projects such as Kumgang Mountain Tourism within DMZ zone are proposed to bring socio-ecological interactions. So far the most successful projects are Kaesong Special Economic Zone and Kumgang Mountain Tourism.

To conclude, the location of interactions with North Korea are mostly located near border regions. This is due to North Korea’s controlling policy to allow limited area of their territory for economical trade. Situating SEZs near border regions it creates another islands to protect the territory. Most of interactions happened to bring economic synergies however there were other type of suggestions, such as Peace Park, Neutralized zone managed by UN, or peaceful management of common river regions.
3.2 PLANNING SYSTEM IN SOUTH KOREAN BORDER SIDE

In recent days, policies in regarding to larger context of unification have tendency to be applied onto border regions. However, lack of systemic arrangement among different departments and institutions have triggered sprawl development.

A chart above shows the relative laws regarding border regions. Three types of laws are existing: Control, special, and supportive laws. In the early stage of border regions’ law, they were more about controlling laws that define the limit and use of border space. Limits on the use of military facilities, nature or cultural properties are applied. In 1990s to 2000s, special acts for cooperative developments for special economic zones activated, called Inter-Korean Basic Agreement. This act result in successess of economic interactions between two Korea however they are affected by political conditions. In recent days, supportive laws such as ‘Border regions support act’ were applied to relieve the regulation of the border regions eventually improve the life of border regions’ residents and prepare for the future cross-border development.

Figure 3.2.1 Horizontal planning system of South Korean border regions. by Author
SPATIAL PLANNING: TOP-DOWN SYSTEM

“...The way to set coodinated system among local governments and governmental departments to manage the border regions effectively...”

VERTICAL INSTITUTIONAL SYSTEM: DIFFERENT LEVELS OF LOCAL GOVERNMENTS

Another problem is coordination among local governments and departments. Those are related to unification policy and settling individual plans and visions. They first start from the same policy but translated differently according to each department’s characteristics and local municipalities’ situation, eventually stay as scattered. Nature management department has a plan to preserve ecology; meanwhile economy department set a plan to foster economical investments. According to ‘<Demilitarized Zone landscape management guideline>’ from Ministry of Land, Transport and Maritime Affairs, “The way to set coordinative system among local governments and governmental departments to manage the border regions effectively” is required. Interviewee Lee also mentions lack of comprehensive and coherent plan for border region is the major issue to be solved. In his paper he claims the importance of formulating combined programized plan, coherently related to national policy instead of scattered individual projects. From his papers major institution that coordinates and manages among different parties is required.

These situations cause competitive relationships among local governments to get support from different ministries. Also, according to the National land planning and Utilization Act local municipalities plan should reflect the plans from province: top-down system. This makes province difficult to reflect the local demand, and create passive relationship of local municipalities. Local residents are the ones who get informed after the plan is set. Bottom-up approach to allow local initiatives and stakeholders to involve in the planning procedure is required.

Figure 3.3.2 Vertical planning system of South Korean border regions. by Author
3.3 SPATIAL CONDITIONS

To analyze complex spatial conditions of border regions, three layers of economic, sociocultural, and biophysical qualities are chosen. Also, three scales of national level, border regions, and district level are selected. In this chapter, brief condition on national level and detailed map and analysis of border regional scale is shown. Analysis on district level will be introduced after setting the vision, to prove it through strategy and design intervention.

ECONOMIC

Existing railway of Kyung ui can be connected to North Korea to operate TKN (Trans Korean Railway) in the future. This will be connected from South Korea to China, Russia, or even to Europe. Since the railway passes Seoul and Kaesong, it is not operating at this moment, this can be used as a part of strategy to foster the connection between Paju and Kaesong eventually to create new metropolitan network of Korea.

Other 9 roads and railways pass through the border. However, if this recovered, disconnection of DMZ ecology network is unavoidable. Therefore sensitive approach is required considering first to use the minimum number of railway or road, and to propose alternative way to use both roads and preserve nature.

SOCIOCULTURAL

Since CCZ villages were settled after 1950s, they have diverse backgrounds of origins. In 1972 Baekyun-r and Tongi-chon first formed the village by returned soldiers and displaced people who lost chance to go back to their North Korean hometown, in 1960 Mahyun-r by victims those who lost their houses from storm and flood, in 2001 Harnung-chon participants to show the willingness of peace and unification. Since villages created, they faced difficulties of cultivating their land, sense of uneasiness from military conflicts, or regulations of access; those were mostly neglected from governments due to military reasons.

Now both North and South Korea limits the access of border regions. North Korea has tourist's limited zone, indicating the region where visitors' access is not allowed.

Due to the prohibition of development within CCZ, people of villages were suffering from lack of basic needs. Social infrastructure, density, Aged-child ratio is under the average of other normal cities.

BIOPHYSICAL

The major spine Baek-du mountain range is situated at east part of peninsula. Because of this, the general geography of Korea follows east high mountains, west-low lands. The border DMZ is therefore a sectional ecotone of Korean peninsula. East part consists of wild landscape with endangered animals and species.

West part: De-positional landforms along Seochun and Imjin River. Due to the rich sediments of river and wetlands, previous agriculture landscape swells, and migratory birds stays for winter. This region is an important area for migrating birds in winter.

Middle: Pyunggag Ratau area with Highland plains and Wetlands. This area is the highest productive in agriculture use. Traces of historical ruins are mostly located in this area.

East: Haseon basin area and Natural forest with broad leaf trees. This area contains Baek-du mountain range, Deep range of mountain is filled with wild forest. Endangered species of bear, mountain goat, or otter habitat in this area. Therefore this area has the most valuable ecological connection from North to South.

Figure 3.3.1 Spatial conditions in different scales and sectors by Author
SPATIAL CONDITIONS. SOCIOCULTURAL | VILLAGES AND HUMAN ACTIVITIES

- Villages
- Agriculture
- Illegal reclamation
- Military conflict

0 10 20 40km N

Type 1. Paju wetland and plain
Type 2-3. Plain with forest
Type 4. Mountain range

BIOPHYSICAL FEATURES

ECONOMIC FEATURES

SOCIOCULTURAL FEATURES

Figure 3.3.4 (left) Social activities in border regions. Information from Green Korea. Revised by Author
Figure 3.2.9 (right) Image of border regions. Revised by Author
To conclude from historical review, planning and spatial analysis in the previous chapter, one could find two distinctive qualities of human activities and nature are separated in the border space. Where human access is limited, natural abandonment exists; meanwhile where human activities are emerging, natural destruction is accelerated.

**NATURAL VALUES**

Ecological values are dominant in the DMZ area and CCZ area. They tend to flow regardless of administrative or political border lines, however they are blocked where physical borders exist: NLL and SLL. DMZ ecology is in a way fragile, since they mostly flow from east to west. Another issue is that since CCZ development has been accelerated ecological network is disconnected by illegal land reclamation and touristic districts. CCZ is highly important in ecological perspective of view, since they work as a ecological corridor reaching to urban ecology outside of the CCZ.

**HUMAN ACTIVITIES**

On human side, CCZ regions are facing lack of basic social and public services such as education, hospital or infrastructure. Because these and limited access into the CCZ, villages in CCZ regions are shrinking, increase in aging population and less incomes. Since border region support act applied, South border regions tend to be developed along the major highway and railway networks, extending from near cities. However those developments are mostly tourism purpose and located outside of CCZ area due to the military and ecological preservation reasons. Where CCZ area is developed, they face natural destruction and local residents get loss benefits from the development due to top-down planning system.
**POTENTIALS & CONSTRAINTS**

**CONSTRAINTS**

Major problems of south border regions are found by each three layers: DMZ, CCZ, and border regions. Since they have different degrees of permeability, each border frontiers face different issues.

DMZ is the zone where any access of human being is allowed. Due to this circumstances, the nature is abandoned. This lead the zone to have rich biophysical values however they could not be managed and preserved in proper way. In case of fire, or buried mines. Also physical fence around the zone created abnormal horizontal ecosystem, blocking vertical (south to north) network. The vertical network of mountain spines and rivers could reach to inland, from south part of Korea to Russia. 

CCZ has a limit access of civilians. This have created the unique social conditions of villages and nature. They village people have strong social bond with soldiers, and nature and most of the economic use of the land was for the agriculture. However in recent years since border regions development, they face the new flows of out-corners, such as tourists or investors. This changes the use of the land into touristic districts or illegal farmings. Since the ownership of this zone is complicated, some have conflicts on land ownership. These trend made this zone more fragmented and destructed natural values.

Border regions are under the pressure of development more viable, due to the limit access to CCZ. Because most of the cities in this regions are developed near to the military facilities, linear sprawl along the major traffic network is accelerated.

Those problems are due to first, the lack of comprehensive planning on three layers as one system. Second, less communication among local municipalities. Third, fragmented land use and infrastructure, eventually distinctive three borders create thick border.

**POTENTIALS**

However, there are potentials that could make the border regions more resilient and developed in a successful way.

First, the border regions are the area where cross-border development could be tested.

Because the relationship between two countries are still, the border regions could be a good starting point to have a interactive relationship. Second, the high value of natural landscape makes the regions distinctive. If the region is developed properly, they could attract more people who appreciate the value of the nature and the natural corridor could be connected from south to north. Last, existing infrastructural network that pass through the South Korea to North Korea is highly important. To activate cross-border developments, those major traffic network could be used, especially at the nodal points of the lines and the CCZ regions. Also, those lines could let the south border regions more accessible. When considering the fact that this network disconnects the ecological networks, they could be reshaped to link the ecology around the border regions for the future developments and natural preservation.

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Figure 3.4.3 (Left) Constraints of three border. Drawn by Author

Figure 3.4.4 (Right) Potentials of three border. Drawn by Author
4. VISION & STRUCTURAL PLAN

TO BRING A MUTUAL AGREEMENT: DRIVERS / VISION & GOALS: NATIONAL SCALE
/ ANALYSIS IN REGIONAL SCALE / STRUCTURAL PLAN: REGIONAL SCALE
4. INTRODUCTION VISION & GOALS

“How territorial cooperation mechanisms of planning and design can be applied to the Korean border to facilitate future cross-border developments that consider local communities and ecological values?”

TO BRING A MUTUAL AGREEMENT: DRIVERS

From analytical framework tools are applied to read and understand spatial & institutional condition of the border area. Through this analysis, diagnosis of analysis are shown. Based on this basic question arises: What could bring a mutual agreement between two nations, to enable cross-border development? This will be the drivers to activate cross-border activity in Korea border regions.

VISION & GOALS: NATIONAL SCALE

After the position is set, goals and vision of the project will be drawn. Principles to reach vision is also mentioned in detail.

ANALYSIS IN REGIONAL SCALE

To reach specific structural plan, analysis in regional scale are conducted. One of the major strategic point region is selected, Paju-Keasung region. Infrastructural network, water network, and green network are analyzed to realize vision in detail.

STRUCTURAL PLAN: REGIONAL SCALE

Through analysis in regional scale, structural plan is drawn with characteristics, quality and direction of Paju-Keasung region. Since this region is near Seoul metropolitan region, nature research & education function is suggested. Direction on centrality, accessibility, natural system are mentioned.

Figure 4.1 Motivation of the project
Source from: ONJO walking through
15km trail, Green Korea
4.1 TO BRING A MUTUAL AGREEMENT

From historical review, there has been a mutual agreement on border regions. First was setting a border line, and then the next was inter-Korean exchange and cooperation act. Through this act, Special Economic Zone in North Korean border side could be established. In recent periods, the government suggests several proposals results in no-response from North Korea. Interviewee Son mentions, “Most of proposed projects could not be realized in lack of consideration on political issues. Those ideas seemed to be bright however they failed to fulfill the desire that North, South Korea, or East-Asian countries had. Political, military, economical, environments, cultural aspects should be beneficial to every political actor. Then what could bring a mutual agreement between two countries, which enables sustainable cross-border development?”

POSITION: NATURE FOR THE CROSS-BORDER DEVELOPMENT

In conclusion from analysis, cross-border development in Korea succeeded the first step: setting agreements and development plan. Economic developments such as Special Economic Zones in North Korean border side and tourism district in South Korean border side are the ones that brought instant success on border regions. However these zones operate when the political situations are optimistic and stops when the political circumstances become worse. It is important to think how to activate the whole process in long term perspective. Short term success neglects regional people and participates during the planning procedures. Current developments has been pointless in a long term perspective of view, causing natural destruction, sprawl developments and less success. Then what could bring a mutual agreement that is sustainable to both nations and local people? I suggest to use ecology as an alternative, to activate the cross-border developments between two countries and to respect the values of natural and sociocultural border conditions at the same time. Instead of economic or touristic islands, the nature could be used for the cross-border development.

THE VALUE OF THE NATURE

The Korea border zones have special natural conditions. In DMZ border zone they are free from human beings’ interruption and regularly disturbed by natural fires, which has created heterogeneous eco-system. Also they are situated at the transitional part of southern and northern species habitat that only shows succession process of temperate-tertiary nature on earth. This ecosystem has high value because they connect east to west axis of Korea peninsula. Diversity of natural landscape such as coastal and forest ecosystem, river back marsh, agricultural wetland, mountain valley marsh have become safe habitat for the endangered species. However climate changes in recent days have affected this zone to have abnormal land slide or fire, causing natural destruction. Also intense military confrontation have kept human away from proper management for the nature.

In CCZ border zone, agricultural field with few human settlements and less military operation have preserved the nature than DMZ. Due to the farm fields and less fire, the general age of the stand is higher, even some climax forests exist. These could be created and preserved by limit access of civilians and agricultural oriented land use. However the current trend of developments in this zone such as special economic zones or tourism districts have disrupted the natural border condition. Railway, highway or tracking path are cutting the existing ecology network and illegal land reclamations are reducing the habitat for the species.

CROSS-BORDER DEVELOPMENT FOR THE NATURE

In this sense, the reasons why ecology could be the main driver for the cross-border developments are following:

First, the nature is the element that flows regardless of human administrative lines or political boundaries. This indicates both side of the border regions mutually share the same feature, a common ecosystem. This can be potentially used to facilitate human interactions between two nations.

Second, since they share a common ecology, sustaining a unique ecology for the border zones require a cross border approach. As mentioned from the value of the nature, the natural condition could only be sustained properly when they are managed in an adequate way. To preserve and manage them for the future natural resources, the whole borders should be treated as one-system. This requires both countries’ cooperative management, which can become an opportunity to trigger a cross-border relationship.

Third, because the border zones have such a high quality in the natural perspective of view, it is crucial to prepare for the future development considering this value. When unexpected unification or progressive cross-border developments are going to happen in the future without any thought of this values in advance, the nature will be ignored by rush developments. Taking account from the most promising trend that the border will face to be developed in case of cross-border activities, they must prepare the guidelines on how to deal with this precious nature. This idea is also to use this space for the reconciliation of human beings: remembering that the border and the pure nature has created by the war in the first place. To activate the cross-border development does not simply mean to bring a synergy between two countries, but to bring a reconciliation and co-exist in this border. Therefore through the agreement on cross-managing nature, “People” could become an activator and guardians for the nature, instead of political agendas.
4.2 VISION AND GOALS: NATIONAL SCALE

MAIN GOAL

PROGRESSIVE BORDERS!

The goal of the project is to make co-existing border conditions with the nature, local residents and visitors through progressive steps of re-purposed infrastructural networks and nature research centers.

SUB GOALS

ENVIRONMENT:
Preserve the core high-value natures, strengthen and integrate the natural corridors into the human settlements by using existing networks.

ECONOMY:
Increase diversity in economic activities by strengthening and specializing local centers with research centers.

SOCIAL:
Improve basic needs and support of social infrastructure to keep community’s identity but still open to cross-border activities to bring social synergies.

Figure 4.2.1 Vision in national level. Drawn by Author.
PRINCIPLES

To elaborate the goals of the project, redesigning the planning tools, processes and institutional forms that would allow a stronger economic and spatial structure for the development of the Korean border regions are explained.

1. NATURE TO BRING A SYNERGY

Nature could work as a main element in the development process which brings social and economic synergies. Social integration and economic activities could be set in motion through vitalizing environmental values. This implies the project aims to react to current trends of economic, sociocultural, environmental priority in border regions, considering both nations and local communities in border regions.

2. LANDSCAPE AND INFRASTRUCTURE AS A CONTINUOUS LIVING SYSTEM

Now the border is blocked or only allows limited access. To make the border co-existing conditions, two linear networks of nature(river) and infrastructure(railway) that flow the whole zones will be used to shift the human activities and the nature in and out of the border.

- Railways to transport nature

To do so, the first objective is to maximize the use of railway network. The railway network is currently used as human transportation, disconnecting the natural connection. However, they could be used to transport the nature outside of the border. Green could share the human infrastructure, as a connection of the nature.

- Rivers to link human

The second objective is to minimize the human interruption along the river network. Since they work as a crucial natural corridor that connects in and out of the border, rivers that are located near the development area are vulnerable from human activities. Already some natural lakes or wetlands are reclaimed under the pressure of developments. However, rivers could link people into the border too. People could share the natural corridor, as a connection of the human activities. Instead, people manage them ecologically to preserve biophysical conditions.

3. INSTITUTIONAL FORMS

Finally, the concept proposes a new platform that local actors(society, military soldiers, development cooperatives) could meet and share an agreement on how to develop the regions into more resilient and coherent living system. This agreement should be in line with the framework of the whole border regions.

To do so, the project proposes research centers to work as a sub-platform in a local level. They could become a local community’s voice and listener that makes all the stakeholders gather in one place. To set the comprehensive planning (Border Committee) could be established, that enables communicative institutional organization among central governments and local municipalities. They could be the main platform that brings a large scale actors into one place, and share the idea and opinion. Three major research centers could meet at this committee, to adjust their local directions and share visions. Then top-down planning and bottom-up planning could be modified. The committee could suggest strategic planning, partly provide subsidies to local municipalities. As a result, the concept strengthens the local level and creates more equal institutional forms, processes and planning tools.

VISION

THREE STRATEGIC POINTS IN THE BORDER

These major railways are used to attract people and connect the nature. Kyungsu, Kyungwon, and East sea railway lines are the major three networks, and Paju-Kaesung, Cheorwon-Pyungang, Goseong (Sanho-Jaejin) are the cities that have the border regions and the passing railways. Also, rivers are situated near the railways in the border. Those three areas are the most promising regions that could be developed in the future.

Therefore these strategic points in the border regions are chosen to foster the cross-border developments, considering the nature and local participants.

Each points has a nature research center, where shows the representative and distinctive landscape qualities of DMZ:
A. Nature research & education : Paju-Kaesung
B. River limin & wetlands with abandoned agricultural land : Cheorwon
C. Cultural assets and bio-agriculture R&D : Cheorwon
D. River Haman, Sang ou & spring water with agricultural wetlands : Cheorwon
E. Green energy & restoring lagoon ecology : Goseong
F. River Nam & Lagoon and lakes with sea ecosystem

*Figure 4.2.2 Diagrams illustrate principles. Drawn by Author*
4.3 ANALYSIS IN REGIONAL SCALE

Project Description

To show how the vision works in smaller scale, one of the major three strategic points is chosen: Paju-Kaesong area. This area is for the nature research and education specialized zone, to foster cross-border development.

Why this area?

The reasons why this strategic point is chosen are first, this area has the most potential to be developed into the next stage of cross-border activities between two countries. There is already special economic zone in Kaesong (North Korea) where both countries started to cooperate in economic way and Imjingak tourism zone in South Korean part, one of the few CIZ areas where civilians are allowed to visit for tourism purpose. These imply there are more possibility to let multiple initiatives and actors to be involved during the cross-border development process.

Second, this area is situated in Seoul metropolitan region, only about 30km away from the city Seoul. The area is one of the city of Seoul metropolitan region, Paju. Also the city Kaesong has been one of the major cities in the history. The Kyong-ri railway connects these cities and eventually reach to Pyongyang, the capital of North-Korea. These proximity of major cities and networks indicate the possibility of the creation of future economic and socio-cultural mega-networks between two countries, furthermore with East North Asian countries such as Tokyo, Hongkong, Beijing, or Shanghai metropolitan cities.

Third, due to the trends of developments and illegal land reclamation, the natural destruction has been arouse at an alarming stage for this area. This area denotes a future pressure of developments around the border regions, that might ignore the value of ecology and be developed as expansion of major infrastructural networks. When considering the fact that this area has the most potential to be developed into mega-city regions in the far future, the management of ecology system and landscape harmonized with the trend of development should be considered in the earlier stage.

Figure 4.3.1 (Above) Dynamic qualities of border regions, by Author. Figure 4.3.2 (Left) Paju-Kaesong project area, by Author.
Kyung-ui Railway and Tong-il(unification)way, Jayu(freedom)way are the major infrastructure in this area. Along this infrastructure most villages are situated. At the end of the roads and the railway, ImjinGak leisure tourism district is located. ImjinGak station and Tongil bridge have the check points to the entrance of the CCZ. Railway and highway network reach to Kaesung SEZ. Each side has another check points and customs, one in Dorasan station and the other in Panmunjeom station. Recently bike path is connected from Seoul to this region, along the freedom way. This links major touristic points in this area, reaches to ImjinGak.

Figure 4.3.3 (left) Infrastructure network map by Author
Figure 4.3.4 (above) Kyung-ui railway for Kaesong SEZ
Figure 4.3.5 (below) Highway checkpoint
IMJIN RIVER AND SACHEON RIVER

Imjin river is the major river system that reaches from inland to West sea and to Han river in Seoul. Sacheon river is one of the branches of Imjin river, that flows from Kaesung SEZ and DMZ in North Korean side.

Imjin and Sacheon river both have been suffering from water related problems: Imjin river for flooding and Sacheon river for contamination from SEZ. Coloured area are the risk area for flood and contamination. These area are also known as valuable wetlands in this region. However due to the political and military tension around this region, proper management has been limited.

Figure 4.3.6 Water network map by Author
Figure 4.3.7 (Above) Sources from: http://www.or.kr/www/index.php; document=110865
Figure 4.3.8 (Below) Sources from: Kijon Kim
Three major borders create different levels of ecology. DMZ, where the most dense ecological variations has natural patches such as wetland created from abandoned agricultural fields, grass fields, forests with mountain, etc.. CCZ: work as a buffer between DMZ and outside of CCZ. Since most of the land are now under the preservation areas for military functions, nature and agricultural use, the nature is quite well mixed with human. However illegal land reclamation is one of the major issue that destructs natural values in this zone. After CCZ, border regions has some mountain and forest patches with specific species. However this area is more actively used by human, and corridor for the nature. All of these borders ecology are currently disconnected by traffic infrastructure and river.

Figure 4.3.9(b) Green network map by Author
Figure 4.3.10(Above) Diagram disconnecting element of area by Author
**4.4 STRUCTURAL PLAN: REGIONAL SCALE**

**CONCEPT**

**ECOLOGY ISLANDS TO CONTINUOUS ECOLOGY**

From spatial analysis, one could find ecology system is now formed islands by human traffic infrastructure and river system. The blocks nature to be worked properly. To realize principles and visions from previous chapter, the concept is to use disconnecting elements to connecting ecology. This fulfills nature to work as a major strategy to bring sociocultural and economic synergy. Places where rivers and railway meet are selected as a critical projects to illustrate how this concept is applied in spatial way. Through connecting ecology, endogenous developments of local community and cross-border activities could be facilitated. Different strategies are applied by each borders, to connect ecology. Following design and strategy are explaining how this concept could be realized.

**DIRECTION, QUALITY AND CHARACTERISTICS**

**PAJU-KAESUNG AREA AS NATURE R&D HUB**

Selected areas has possibility to be developed into nature R&D hub, run with joint nature research centers between two Korea. Due to the location that is situated near Seoul metropolitan region, this hub could provide visitors from major cities amenity functions, e.g. eco-park and cultural facilities linked with bike paths. CCZ regions could have endogenous development with nature research center, and border region could have related business and increase in residential density. Supportive cities will provide economic & social infrastructure to border region nodes to grow as networked system.

Figure 4.4.1 (Left) Concept diagram, by Author
Figure 4.4.2 (Right) Structural plan, by Author
STRUCTURAL PLAN

CENTRALITY
- CCZ: Endogenous development with research center, supportive social, cultural platform
- Border region: Tourism/Eco-park, Green technology related business
- Supportive growth cities: Residential densification, social infrastructure, public transportation

ACCESSIBILITY
- Incheon area: Logistic points for distribution
- Train: Global inland logistics, future eurasia line
- Freedom way: Metropolitan network, to harbour and airport Incheon
- East-west border road & bike path: accessibility within border regions

WATER SYSTEM
- Flood risk
- Injin river: natural wetlands, dykes, sluice
- River branches: underground storage with park, productive landscape, Pollution
- Sacheon river: purification facilities, purify wetlands (eco-park)

GREEN SYSTEM
- Water front: leisure use, flood prevent wetland parks, accessible by bike
- Railway: Eco-corridor by urban green park, storage & productive use
INFRASTRUCUTRE GREEN NETWORK PLAN

POCKET PARKS AROUND STATIONS AND
LINEAR GREEN NETWORK ALONG THE RAILWAY

Each station area could grow as the process evolves. To allowing the expansion but also to limit its endless sprawl, buffer for urban parks and natural preservation area could be set. This will function as a green corridor to the urban area, but also attract more people into this region.
WATER FRONT NETWORK PLAN

PRESERVED, ECO-PARK WETLANDS AND RESERVOIR FOR FLOOD & CONTAMINATION

Along the river network natural park with wetlands could be built with bike path. This will prevent the Paju regions from flood and attract more people into the river. Also the wetland could be preserved natural ones or constructed wetlands. To the branch of the streams, sluices and productive landscape could be situated to control water in case of dry or rainy seasons. In the urban area, water reservoir could be built for retain the water in flooding case and for the living water in daily times.
5. STRATEGY & SCENARIOS

전략 및 시나리오

PROGRESSIVE STRATEGY: MULTI-SCALE / FUTURE SCENARIOS: LARGER CONTEXT
How territorial cooperation mechanisms of planning and design can be applied to the Korean border to facilitate future cross-border developments that consider local communities and ecological values?

PROGRESSIVE STRATEGY

Through vision and structural plan, illustration on strategy in progress will be introduced, to show how the goals and directions could be realized by stage. Four steps of cross-border development mechanisms from theoretical studies will be applied in Korean context, to think about the practical realization.

FUTURE SCENARIOS

Since the strategy is for 25 years of frame suggestion, the changes in the future after the proposal applied should be considered. Two opposite case are shown, one low scenario and the other high scenario. In the case of lower participation by political situation or economic conditions, there will be less development evolved, creating a border regional network. In the case of higher participation, there will be more development, creating metropolitan networks.

Figure 5.1 Introduction critical proj ect area. Image by Author
5.1 Progressive Strategy: Multi-Scale


1. Top-Down: Special Research Zone
   Environmental Interaction: DMZ & CCZ

2. Bottom-Up: Research Bases
   Social Integration: Border Regions

3. System & Identity of the Region
   Regional Identity: Kaesung-Paju Region

4. Impact onto the Region
   Economic Synergy: Seoul-Kaesung Metropolitan

Figure 5.2.1 Progressive strategy: overall diagram. By Author
CRITICAL PROJECT

Three major points of A. Joint research center. B. Floodplain eco-park. C. Purification eco-park are chosen to show how the whole strategy could work as one system. They are linearly situated along Kyungsung railway and each has river and railway station. They operates as one system gradually that allows connecting eco-system, resolving environmental risks, sociocultural fragmentation and economic stagnation through endogenous developments.
1. **Joint Research Center**

Existing railway station has custom, check point and loading dock. However they built the zone too large, leave paved surface with less use of the land. Therefore the joint research center will be situated within this zone, to reuse a part of the land. Public space for tourists visited through the railway and research center building will be near the station area. Laboratory, accommodation, fields for the breeding and cultivating species or plant from DMZ, and seed bank will be located southern part of the station area to have private atmosphere. This area could be shared with North and South researchers, allowing reside in the center.

2. **DMZ Eco-Bridge (Train)**

Since DMZ is not accessible to both countries, eco train will be used to transport nature in the zone. By constructing extended railway branches and slides for the bridge, the train could be parked at the branch of the railway for a year, completing the eco-bridge. Through this, the bridge could connect eas to west connection of ecology in DMZ allowing species to move and trains could pass by without any disruption. The Eco-train could transport nature such as plants or microorganism moved from DMZ. They then replace into another eco-train for the next year. Returned train could be investigated through each research bases in South and North Korea and send the data back to centers. The collected data will be transported back to DMZ, as part of the slides. This will become an archive for future generations.
Figure 5.2.7 DMZ Eco-train current situation. By Author

Abandoned agricultural lands: transformed into wetlands

Car road: Disconnects ecology

Railway: Disconnects ecology

Eco-tunnels: Abandoned due to difficulties of approach DMZ
Natural Interaction
Joint nature research institute & Eco-train

Shared ecology becomes an initiative project to bring cross-border development, by transporting nature in DMZ and conducting joint nature research activities.

Figure 5.2.8 DMZ Eco train proposal
by Author
3. IMJINGAK LEISURE PARK: FLOODPLAIN WETLANDS

Flooding area are going to turn into natural wetlands, with species and plants breed and cultivated from DMZ. Local initiatives and researchers could involve in this process, to create wetland eco-park. Natural wetland will evolve by time, forming naturally with species from DMZ and CGZ, plants to bring endangered species into this park.

Summer and winter dike function as flood defensive use, with pedestrian and bike path. Extended deck let visitors to observe the nature of the park. Suicides control the flows of water in case of dry seasons or rainy seasons. Through this, research bases with community centers could involve and find the possibility to bring social and economic synergies to their community.
Social Integration

Part of the transported nature will be implemented in each eco-park, waiting for its natural growth. Research branches will serve as a local community center, to bring social integration and further on to foster endogenous development. Eco-park will become a tourist points bringing multiple social actors.
Since the Special economic zone has built in a short period by political circumstances, there are lack of purification factories in the zone. Currently polluted water from SEZ flows into Sacheon river, degrading the natural values of wetlands along the river. Therefore the eco-park with wetlands and purification facilities will be built along the SEZ and river. Through this, labors and village people could use this space as public park. Also the purification facility will save the money from the industrial zone. Research base near the park could manage and care of purification process and plant species from DMZ.
Social Integration

Part of the transported nature will be implemented in each eco-park, waiting for its natural growth. Research branches will serve as a local community center, to bring social integration and further on to foster endogenous development. Eco-park will become a touristic points bringing multiple social actors.
3. SYSTEM & IDENTITY OF THE REGION

Regional Identity: Kaesong Paju region

PAJU-KAESONG BORDER REGION

Through the following steps, each research bases with community centers could cooperate through the research center. They could host international conferences or expo, to share the knowledge and data of endangered species and preservation process. Sometimes they could share some information that are complementary to each other. Also eco-park in each side could bring more visitors, investor, education purpose students to study at institute. In case of positive conditions, both could throw the local festival with migratory birds observation and harvest of eco-train plants in fall/winter. This will enable both parts to be operated as one system, eventually create the identity of the region.

Figure 5.2.18 Kaesong Paju border region network proposal. by Author
SEOU-KAESUNG METROPOLITAN REGIONS

Through this, Paju and Kaesung could benefit from R&D activities with research branches and green technology business. Entrepreneurs who are willing to invest on this business district could develop the platform for the new industries. Both sides could cooperate to share the technology and knowhow, and manufacturing or development process. In the positive condition, both R&D district could share the goods and labours for the economic synergies. This will bring benefits to not only Kaesung or Paju, but also metropolitan networked cities. Seoul metropolitan region could be linked with Kaesung regions, in a environmental, economic, and sociocultural way.
1. TOP-DOWN: SPECIAL RESEARCH ZONE
Environmental interaction

AIMS: SETTING AGREEMENTS & DEVELOPMENT VISION

ACTIONS:
- Select profile for core developments; Aiming for major infrastructure
- Infrastructure improvement, extension of rail to transport tourism improves accessibility
- Institutional organisation; Setting organisations for core regions (BORDER commission)

ACTIONS: North and South Korean government, government departments, provinces and city council; research centric organization, railway company, military base

2. BOTTOM-UP: RESEARCH BASES
Social integration

AIMS: MOTIVATION FOR LOCAL ENDOGENOUS DEVELOPMENT

ACTIONS:
- Cooperation among stakeholders: To develop Ecospace, related research activities
- Communication platform: communication platform (Paju, Cheorwon community center)
- Support from near cities: use social infrastructures from Paju and Cheorwon

ACTIONS: Local farmers, research organization, developers, Paju municipal, Kangwon government authorities, Social initiatives of local participants, NGOs, military base

3. SYSTEM & IDENTITY OF THE REGION
Regional identity

AIMS: BORDER REGIONS AS ONE SYSTEM

ACTIONS:
- Operational mechanism: Cooperative relationship between two community economic research bases, and two cross-border research documentation
- Sharing goods & labour: Shared ecosystem and data. Researchers and workers coordinate the database for conferences, maps
- One new region: Kangwon-Paju region for nature research and education; Cross economy, social, and environmental system

ACTIONS: Joint organization of research center, Kangwon and Paju community centers, local municipality, Government departments

4. IMPACT ONTO OTHER REGIONS
Economic synergy

AIMS: INFLUENCE ONTO OTHER REGIONS

ACTIONS:
- Relationship of nations: To peaceful coexistence relationship
- Market development: Social-Kangwon region by network, Related MBO business of green energy, chemical, or medium goods around Kangwon S/C and Paju area with cooperation of North and South research institutes

ACTIONS: Related business enterprises, universities, North and South research bases, local residents, local municipality, Paju and Cheorwon community centers
5.2 FUTURE SCENARIOS: LARGER CONTEXT

ACTIONS, ACTORS AND FUTURE SCENARIO

STRATEGY

IMPROVE ACCESSIBILITY

CROSS-BORDER REGION

RAILWAY NODES
Local endogenous development

RIVER CORRIDOR
Allow visitors: tour, leisure

NATURE CORRIDOR

FUTURE TERRITORIAL & SECTORAL COOPERATION ACTIONS

Economic synergy
Improve metropolitan transport network, urbanization near cities
Sociocultural interaction
Allow flow of new influx of populations, e.g. tourists, scientists; developed local community
Biophysical integration
Protect border regional ecology; allow leisure, tourism activities in border regions

1. Eco border region
Eco-park region
CGZ eco-tourism
Sub nodes in border regions

2. Green metropolitan
Green metropolitan network
DMZ national park
Seoul & Kaesung growth

3. Border villages
Sprawl development
Scattered low density villages
Land reclamation for agriculture

4. Urban metropolitan
Seoul-Kaesung metropolitan
Sub border cities growth
Urban green

Figure 5.2.1 Strategy and cooperation actions on the border region

Figure 6.2.2 Scenarios after strategy

Expected time to realize this strategy is 75 years. After this time frame, future cooperation actions to achieve further development are suggested. These actions are basic requirements in generic situation, however the degree in growth is less expectable (figure 6.1.3). Therefore in this part, reflection on the future scenarios on spatial strategy are introduced. Two major factors are the degree of intensification on cooperation and ecological preservation. These will decide 1) density and linkage of built up environment, and 2) the use of green structures whether urban green or preserved nature.

1. ECO BORDER REGION
Low cooperation and high preservation on nature will bring the region into low density, yet has centers of villages with much green spaces. The region will have the identity as ‘Eco-border region’, that will attract tourists and researchers to value the nature.

2. GREEN METROPOLITAN
High cooperation and high preservation on nature will make the region into greened metropolitan region. Seoul-Kaesung region will be linked as one region, but less density in the border regions with preserved national park.

3. BORDER VILLAGES
Less cooperation and low nature preservation will lead the region to be border villages, with sprawl development with vast area of land reclamation. This case is the least favorable future.

4. URBAN METROPOLITAN
High cooperation with less nature preservation will cause the region to be developed into sub-border cities with urban green.
ECO-BORDER REGION CASE

1. ECO-BORDER REGION

Low cooperation and high preservation on nature will bring the region into low density, yet has centers of villages with much green spaces. The region will have the identity as "Eco-border region", that will attract tourists and researchers to value the nature.

![Image](http://example.com/image1.png)

**CENTRALITY**

Town of nodal point along railway network will grow, especially near Munsan station. Also sub nodes of small scale villages will grow as regional network reinforced. Villages will be low dense with large green area.

![Image](http://example.com/image2.png)

**ACCESSIBILITY**

Accessibility to the region will be improved, in a moderate level. Public transport terminal are most likely to be situated at Munsan station area, and bike path are going to be developed along the river side.

![Image](http://example.com/image3.png)

**WATER SYSTEM**

Water system will be organized to support the requirement of development. Preserved natural wetlands and eco-park will improve flooding and contamination.

![Image](http://example.com/image4.png)

**GREEN NETWORK**

Green area will be some urban park area around villages and railway network. Also natural wetlands and some cultural use public space will be mixed along the river lines.
2. URBAN METROPOLITAN

High cooperation with less nature preservation will cause the region to be developed into sub-border cities with metropolitan networked region. Growth in major supportive cities will grow to absorb the requirements of the development.

CENTRALITY

Important nodes will be developed in town scale. There will be less sub nodes but instead focus on selected growth at important nodes. As cooperation between two stimulated, logistic centers will be built near Inyungak station.

ACCESSIBILITY

As metropolitan network will be strengthen, accessibility to border region will become various. They could be reached to harbours and airport, and goods transported via highway.

WATER SYSTEM

They are more likely to be used into urban parks and leisure purpose. To prevent from high development around the river, regulation on the land use are required.

GREEN NETWORK

There will be less agricultural use, and more urban parks. Regulation on buffer green area and indication on preserved corridor nature should be set to lessen the sprawl development.
6. CONCLUSION

결론

REFLECTION: REVIEW ON OBJECTIVES AND OPERATIONAL PLAN / RECOMMENDATION
### Territorial Cooperation

<table>
<thead>
<tr>
<th>Status of Development</th>
<th>Territorial Cooperation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Top-down</td>
<td>Policy agreement</td>
</tr>
<tr>
<td>II. Bottom-up</td>
<td>Border region development</td>
</tr>
<tr>
<td>III. System &amp; Identity</td>
<td>Regional integration</td>
</tr>
<tr>
<td>IV. Expansion of Impact</td>
<td>Coexistence relationship</td>
</tr>
</tbody>
</table>

#### 6.1 Review on Objectives and Operational Plan

**Reflection Case Korea Border Regions into Theoretical Studies**

When reflecting the Korean case into theoretical studies, following chart is fitted. To reach each cases, certain sector and territorial institution work as the main agent. Inter-sectoral integration is in larger hierarchy than territorial cooperation, considering the current political condition of Korea. This means, different sectors should well coordinate each other to reach goals in each stages. When the project is implemented, each system could start in separately.

#### Adaptable of the System: Sectoral and Territorial Cooperation

Each system could be developed in different order. Location of development could differ by political, economic circumstances however the main agent in each system/sector follows as suggestion. Then the priority of the sectoral integration could vary by the development. For instance, border region cooperation could start to be developed by top-down approach with government authority and the major sector of the development could be economic or social actors. Suggested proposal is a Tsunami demonstration in the stage. However the key principle applies the same that the ecology should be the underlying element.

#### Review on Sectoral Objectives

**Environment:**

The goal of the environment aspect was to preserve the core high-value nature, strengthen and integrate the natural corridors into the human settlements by using existing network. When reviewing the strategy, following operational plan are shown.

**Actions in detail:**

- Nature institute as local communication platform, Border region committee as central platform
- Reduce vision and strategy by cooperation of intersectoral and inter-territorial scale
- Link joint natural network by railway infrastructure Eco-train

**Economy:**

The goal of the economic sector was to increase diversity in economic activities by strengthening and specializing local centers with research centers.

**Actions in detail:**

- Metropolitan network, Seoul-Kaesung zone-city network, Related R&D businesses of green energy, tourism, or medicine around Kaesung GSEZ and Paju area with cooperation of North and South research institutes

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**Possible ACTIONS:**

South Korean government, ecology departments, province and city council, research center organization, railway company, military bases, nature NGOs

Through railway and river network the ecology could be connected from DMZ to border regions. Also the nature branches work as a major organization that look after the preservation process.

**Social Culture:**

To reach the goal of improvement in basic needs and support of social infrastructure to keep community’s identity but still open to cross-border activities to bring social synergies, strategy are suggested.

**Actions in detail:**

- Cooperation among stakeholders to develop eco-park, related research activities
- Communication platform: communication platform/Paju Kaesung community center
- Support from local: Use social infrastructures from Paju and Kaesung

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**Institutional organization**

Cooperation among stakeholders

**Economic Synergy**

One economic boundary

**Integrative community**

Integrated ecology sphere

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**Territorial & Sectoral cooperation planning mechanism by author**
6.3 REFLECTION

THE RELATIONSHIP BETWEEN RESEARCH AND DESIGN

This project is to suggest a sustainable and comprehensive development plan and a design for the cross-border area between North and South Korea. Creating mutual benefits of ecological, social, economical, and political conditions will facilitate balanced development for local residents in border areas preserving its identity, meet the demand of recreational and cross-border activities, and bring adequate management for natural preservation.

The posture is conceived by taking action of current institutional failures, pursuing:
- New comprehensive strategies for synergetic points of development area combined with local culture and identity
- Defining the level of natural preservation area and ecological connection
- Cooperative procedures for collaborative planning among local residents and different sectors of governments
- Preparation for cross-border development connections, combined with North Korean border part for future scenarios

To do so, thinking about qualities of environmental, economic and socio-cultural values of border regions in local scale is important. Therefore the research has been conducted to find the successive strategy and propose to facilitate cross-border development by case studies. First, by conducting research on the theories of border specifically about the methods of reading the border condition and planning procedure to activate cross-border development, case studies are for the comparative studies to reflect theories into the reality, and cases into Korean context. Therefore the three major cases are chosen: Shenzhen-Hongkong, Inner Germany border, Sweden-Denmark Oresund region. Each case is in a different situation and has different degrees of permeability, however this gives a clue to think on how to create sustainable cross-border region sustainable way. For instance, inner Germany borderline is now one region, and Shenzhen-Hongkong border region is undergoing the development process. This provides a clue to compare and think on the requirements to improve Shenzhen-Hongkong border more accessible and permeable. Through theoretical studies, I came up with general four steps of process in the cross-border developments and requirements for each stage. The following image shows the detail:

This helped me to figure out what is needed for Korean contexts for planning procedure in a longer perspective of view. In reflect onto the case studies, it helped me to understand the general condition and difficulties of creating a cross-border condition. However the use of the case studies itself into the design process is still need to be thought further on.

In analysis, the theory from Martinis is applied to look into the changes of permeability in Korean border by history. Historical reviews by changes of the border space are compared in chronological way. Then the theory from Haselberger about the four layers of border complexity is reflected onto the spatial analysis, to read the border space by political (planning system of South Korea), socio-cultural, economic and environmental aspects. This framework was successfully applied, however the difficulties of reading the space in multi scale and in different perspectives result in taking some time to read the whole area fully. Also it became more difficult to shift into smaller scale to read local conditions. However now I do believe this way of reading the space helped me to find the right approach on the local area, border regions, and two Koreas.

By conveying research of border theory in urbanism and case studies, it gives first, a relative parameter to compare Korean border with other cases. Second, it illuminates different strategic approaches conducted by each progress in cross-border development. Third understanding the relationship between planning and its procedures provides delicate tools and manners to read complex conditions on border regions. When applying the theory into design, case studies are used.
as a part of progressive strategic plan, with scenarios analysis in Korean context. Also they are used to build the strategy followed by process of cross-border development, illustrated with design proposal. This also helps to expand the idea of possible stakeholders, actions and operational plan for the project area. Moreover taking an investigation on cross-border governance system and applying critical ideas into Korean border regions show an interesting paradigm of creating a future relationship between North and South Korea. When reflecting onto the previous stages, this collaborative multi-disciplinary approach helped me to think on other border cases that are facing territorial conflicts in more balanced perspectives of view.

THE RELATIONSHIP BETWEEN THE THEME OF THE STUDIO AND THE SUBJECT CHOSEN BY THE STUDENT WITHIN THIS FRAMEWORK

In this sense, Urbanism research theme 'metropolitan structure' is related to the graduation topic because the project requires comparison studies in spatial planning of other cross-border metropolitan regions such as Shenzhen China border region, Oresund metropolitan region or European green belt passing thorough Germany.

Also the object of the studio is to find the sustainable and endogenous development strategy for global metropolitan region. This is also related to the graduation topic, since the purpose of the project is to find the sustainable planning and design strategy for the cross-border development between two Koreas, especially in Seoul metropolitan region. It is about to find a possibility to preserve the values of ecology and local identity in metropolitan regions. How can we define and transform the cross-border area in a sustainable way by taking account on existing values or constraints of political, environment, socio-cultural and economic contexts? Second, how can border region development contribute to facilitating interaction between North and South Korea? Finally, what kind of comprehensive and cooperative urban planning for border region is required be set to enable cross-border development?

Therefore the objectives of the project are:
First to find the role and possibility of cross-border developments in border regions
Second to suggest a plan and design frameworks that can activate a cross-border development.
Based on these objectives, the project is crucial to develop in a line with the research laboratory Metropolitan structure to understand general urban issues and trends of metropolitan regions, and to discuss related research topics to think on what could be the suitable and reasonable approach in Korean context.

THE RELATIONSHIP BETWEEN THE METHODOLOGICAL LINE OF APPROACH OF THE STUDIO AND THE METHOD CHOOSEN BY THE STUDENT IN THIS FRAMEWORK

General methods of planning framework of studio Metropolitan structure and the framework of this project follows the similar research theme: strategy, instruments of scenarios or visions, or multi-sector planning tools for collaborative planning. The topic deals with multi-sector and multi-disciplinary strategy and planning for metropolitan regions in the world. Korean case could be one of those issues since the project deals with first in the whole border scale, second Seoul metropolitan level, and Keung-Paju regional level in political, economic, environmental, and socio-cultural aspects.

There are some distances combining multi-disciplinary social, economical, environmental approach of spatial strategy in Korean border planning. Especially considering the fact that there is a demand in comprehensive and procedural development planning, this project can contribute to the preparation of future Korean border regions. Such major factors or stakeholders based on scenarios can reach the gap between strategy based governance and current studies of research and design that has been proposed to project regions. Through this project I would like to demonstrate how these approach could affect actual spatial conditions, and also how the spatial demands could be converted into the process of constructing strategic governance. These requirements are reflected in the framework of the project, and are in line with the general frameworks of the studio, that the studio search for the planning structures of the institutional organization, actions, goals or scenarios to realize spatial planning and design. Consideration on actual actors and development procedures help the project in the fact that the project is highly unpredictable by political circumstances and the area has just started to developed in recent years. The framework of the studio will help the project to illuminate those uncertainties to think further on the possible future.
7. APPENDIX

부록

BIBLIOGRAPHY / INTERVIEW AND FIELD TRIP / INSTRUMENTS AND GOVER-
NANCE FOR CROSS-BORDER DEVELOPMENT / CASE STUDIES /
BIBLIOGRAPHY


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INTERVIEW AND FIELD TRIP

Field trip: 21st Nov. - 8th Dec. 2014
Means of transportation: Train and car
Route: From Seoul to Paju
Field trip end at CC2(train) and Imjingak
Duration: 1hr-1.5hr(transportation), 4hrs(walk)

1. DMZ TRAIN
Kyoung-ui Railway: to Eurasia railway

2. CAR WAY
Tong-il(Unification) & Jayu(Freedom) way
1. DMZ TRAIN
Kyoung-uu Railway: to Eurasia railway

2. CAR WAY
Tong-il(Unification) & Jayu(Freedom) way
Interviewee 1. Gi-woong Son
Senior research fellow at Korea Institute for National Unification
Peace (Security) and Environment issues, Unification Policy, Inter-Korean Exchange and Cooperation, German Reunification Issues
Ph.D. in Political Science, Free University, Berlin Visiting Professor, Dept. of Political Science, Freie Universität, Berlin (2004 – Present)
Adjunct Professor, Graduate School of International and Area Studies, Hankuk University of Foreign Studies (2010 – Present)

Interviewee 2. Sang-jin Lee
Research fellow at KRIHS (Korea Research Institute for Human Settlements)
North Korea, North-east Asia studies, Unification Planning
North Korea infra and planning policy
Trans-Korean Railway (THK) & Infrastructure based comprehensive planning
Ph.D. in Doctor of Engineering, Urban and regional planning in T.U. Berlin
Managing director, center for the Korean Peninsula & Northeast Asian Studies (2010 – )
Advisor committee, Ministry of Unification (2012 – 2013)
Director, The Korean Association of North Korea studies (2014 – )

Interviewee 3. Kyu-seok Jung
NGO environmental activist
Director general, Ecosystem Conservation department, Green Korea
DMZ ecology documentation & Nature preservation strategy, organizer of open forum on DMZ development

A proposal which understands the requirements among geopolitical actors would enable to realize Korea-unification.

Q1. What could be the major reason that constrained suggested proposals to be implemented in reality?
A1. Most of proposed projects could not be realized in lack of consideration on political issues. Those idea seemed to be bright however they failed to fulfill the desire that North, South Korea, or East-Asian countries had.

Q2. How does ‘ecological-peace park proposal’ affects in relationship between North and South Korea and even among other East-Asian countries?
A2. The proposal implies the desire of peaceful coexistence of North-East Asia in political, military, economical, environmental, social aspects. This will bring international agreement to use the DMZ and CCZ in cooperative way to relieve political tension.

Q3. What should be considered and fulfilled to activate North-South Korea spatial planning?
Q4. In that sense, how do you see the potential and constraints of Kaesung-Paju border region?
A3 & 4. Political, military, economical, environmental, cultural aspects should be beneficial to every political actors. Of course, the interactive cooperation between North and South Korea is the first step. Economically, it is ideal to consider Kaesung-Paju border region, but that region has the highest military tension. Even developing DMZ inside is not promising at this moment. It would be more promising to develop border regions from CCZ and spread in to DMZ. Ecological peace park could be an alternative to stimulate other aspects of economy and social activities, starting from sublime gesture of nature.
Q1. How does the idea of ‘program-based comprehensive planning’ which you mentioned in your report applied to Seoul-Paju-Kaesong metropolitan network and DMZ?

A1. Seoul-Kaesong metropolitan network will be the crucial part of major economical activities in Korea Peninsula. However the development in DMZ would be less promising. It would make more sense re-using returned-military base within CCZ.

Q2. Does existing planning contain the management within CCZ(Civilian Controlled Zone), such as sprawling-development or under-development?

A2. Several projects are implemented within CCZ past few years. However they are scattered and planned by project-bases. Such management, instrumental preparations or guidelines for this zone is lacking at this moment.

Q3. How do you expect the shrinkage or expansion of cities when Korea unified in the future? Are there any preparation or simulation for this situation?

Q4. Do you see the potential of alternative way of unification, such as north-east economic unification? If this happens, how will this affect to North Korea?

A3&4. It would be far future, if this happens. The metropolitan network idea could be one step towards Economic unification. Any type of unification will stimulate the movement towards certain cities, creating uneven development. Several reports mentioned this issue, and Germany could be a good example.

Q5. What is the institutional constraints of current planning in South Korea towards North Korea?

A5. Complex and fluid political situation brought most of existing planning to be project-based implementations. Most of them are short-term projects, lacking in interrelations. There projects lose their long-term meaning of realization. Comprehensive planning should be under-layered to bring synergy among programs and to have clear vision with strategy.

Q6. What would be obstacles if ‘program-based comprehensive planning’ applied to existing policy and planning?

A6. A major institution that controls and manage several government departments is required. Since the necessity of this institution is not emerged yet, multiple planning and policy are listed by each department. They need the major institution to have communication each other and have consistent policy. However establishing such institution is not easy at this moment.

Comprehensive vision for DMZ and near the zone is required. Economical developments should contain ecology preservation.

Q1. How is the value of DMZ and CCZ regions?

A1. There is a report written from GreenKorea. They are observed and documented by the organization. Since DMZ regions are disconnected by physical borders, they are more likely disturbed nature. I would say. Natural value is high, however they are also highly vulnerable. CCZ regions are going through fast development, which is threatening the nature. However they are well preserved compare to DMZ or outside of the border regions.

Q2. What kind of efforts are suggested to evaluate and preserve DMZ from NGOs, UN and government?

A2. Emerging concerns and interests of DMZ brought many laws and policies. However each department has been making independent plans, which overlaps to each other and even stimulating inconsistent developments.

Q3. Considering the future of unified Korea, DMZ is unavoidable to be developed. What are the actual ecological concerns and problems that are going to be arise in the future?

Q3.1. What is the ecologist’s advice? What norms of instruments or laws should be made?

Q3.2. Which is the crucial part that must be preserved?

Q4. How well the recent ecology park and bike pathway implemented in ecological perspectives?

A5&4. Ecological Axes is crucial to be preserved. Ongoing economical projects already divided several connections. To prevent this, such tunnel or overhead way should be considered.

Q5. How do you imagine the future DMZ?

The area where wild animals can walk around. DMZ is the only area where the pure nature has been preserved in this continent.
INSTRUMENTS AND GOVERNANCE

According to European spatial planning, the expanding influence of EU on spatial development has brought the need of co-ordinated methods across different levels of government and national borders.

- **Spatial development frameworks for the pan-European and the EU territory**

  The demand of spatial development frameworks increased during 1990s in all different scales. These instruments are intended to provide a shared vision and strategy for the territory in question for a certain time in the future (Duij, Colombi and Nadir, 2013). Spatial development framework is described as ‘well worded documents on the aims and processes of spatial development (...) try to be neutral, non-ideological and well balanced’ (Kunzmann, 2000; Nadir, 2013). They seem to be vague and less contradictory since the aim of the framework is to ensure every actor involved in the development agrees by shaping the basic minds.

- **Instruments Spatial visions, strategies and Scenarios**

  **SPATIAL VISIONS AND STRATEGIES**

  Spatial visions and strategies are one of the instruments that are visualized to illustrate ideal conditions in long-term future. Mainly four different models of spatial visions are introduced in the book:

  **Collective views**

  The vision as master plan:
  Provides the collective view of what the region should be like in x years’ time.

  **Future trends**

  The vision as the truth:
  Forecasts of the region in x years’ time. Mostly worst case scenarios. Actions are agreed to counter negative trends.

  **Utopias and dystopias**

  The vision as utopia or dystopia:
  Intends to stimulate debate and prompt action either from a positive or negative perspective.

  **Mission statement**

  The vision as mission statement:
  Rather than presenting a picture of the future, sets down fundamental principles, which cover substantive principles or governance principles.

  **SPATIAL SCENARIES**

  Spatial scenarios are an instrument to help spatial development strategies and visions to be prepared. It is for the exploration of future spatial development trends, and have been described as a particularly suitable way to visualize and communicate complex and slow processes such as those of territorial development (IBRD 2003; Nadir 2010). Mainly three types of scenarios are suggested:

  **Descriptive scenarios:**
  Show the continuation of existing development trends, and the impact on the territory if no policy intervention occurs.

  **Strategy scenarios:**
  Normative scenarios to illustrate the desired spatial future

  **Alternative scenarios:**
  Show favorable spatial structures in comparison to the present situation in radical and Utopian way.
**ECONOMIC DEVELOPMENT**

**SHENZHEN - HONGKONG BORDER REGIONS**

**NEW INDUSTRY / TOWN IMPLEMENT**

- Improve connection from Hong Kong to Inland
- Large investment on new industry: Innovative, high tech
- Shifting industry type from: 1st(agriculture) to 2nd (manufacturing) and 3rd (service)
- New town development

**ORESUND BORDER REGIONS**

**RE/INNOVATION DEVELOPMENT**

- Reuse/strengthen network
- Malmo Harbour renovation: Housing and business
- R&D, Green technology, start-up business
- Oresund bridge: Increased commuting population
- Copenhagen-Malmo metropolitan region

**INNER GERMANY BORDER REGIONS**

**BALANCED DEVELOPMENT**

- Improve infrastructure network East to West (highway)
- Border region support: subsidies, employment
- Local economy and urban regeneration: Housing
- Tourism around borderlands
**SHENZHEN - HONGKONG BORDER REGIONS**  
**CONCENTRATION AND FRAGMENTATION**

Migration population increased.  
1983 fisherman village 30,000 inhabitants to  
2011 99% immigrants, 10,000,000 population  
SEZ created another buffer border around Shenzhen area  
Interaction and flows between two nations increased  
Illegal Immigrants  
Economic concentration caused social gap and fragmentation

**ORESUND BORDER REGIONS**  
**REGIONAL IDENTITY**

Regional news paper and media to create one Oresund region  
Foreign flows increased due to research activities and business promotion  
Commuting within Oresund region increased  
Cultural, Social activity support  
Different system in tax and economy is still a barrier

**INNER GERMANY BORDER REGIONS**  
**SOCIAL COHESION?**

Migration from East to West increased  
East regions shrinked  
Social infrastructure invested: Education, culture, medical care  
Balance between east and west regions partly reached
BIOPHYSICAL EFFECT

**SHENZHEN - HONGKONG BORDER REGIONS**
: ABANDONED / CONFLICTING

- Rural area remains with old urban structure
- Conflict with new structures and human settlements
- Environmental landscape increased sharply due to decrease in agriculture industries
- Ecology preservation plan settled as a consequence

**ORESUND BORDER REGIONS**
: ENVIRONMENT MANAGEMENT WITH GREEN TECHNOLOGY

- Baltic Sea Region ecology management
- Sea pollution research and purification under process
- Green technology with R&D promoted
- Effect of Oresund bridge on ecosystem has not been clarified yet

**INNER GERMANY BORDER REGIONS**
: PRESERVATION

- Green organization BUND initiated natural preservation after reunification
- Province and EU support subsidies
- Created tourism industries along border regions
- Expanded to European scale: European Green Belt
- Green belt now links 160 natural parks, 150 flora and fauna areas, three UNESCO biosphere reservations and the Harz Mountains National Park
SHENZHEN - HONGKONG BORDER REGIONS
: ONE COUNTRY, TWO SYSTEMS
Focused on economy boost: concentration
New town and industry implement: Modernization
Connection to inland and relieve check point

MAJOR FACTORS:
Capitalism VS Communism: economy system differs
Economy gap and industry differences
Land ownership issues around Shenzhen area (China)

ORESUND BORDER REGIONS
: ONE NEW REGION, METROPOLITAN
Economic synergy in border regions: Specialization
Physical connection as a boost: Oresund bridge
Innovative industry and creativity 3rd identity: Cultural and social bond

MAJOR FACTORS:
EU INTERREG support
Copenhagen as a core. Declined industry in Malmö

INNER GERMANY BORDER REGIONS
: UNIFIED GERMANY
Ecology preservation
Local economy: Balanced development
Infrastructure reinforcement from East to West

MAJOR FACTORS:
Ideology, political system, cultural difference
Economic gap
Land ownership caused complex problem
"One day we must come to see that peace is not merely a distant goal that we seek, but that it is a means by which we arrive at that goal. We must pursue peaceful ends through peaceful means."

- Rev. Dr. Martin Luther King, Jr.