AGING OF DEVELOPMENT: THE *SAEMANGEUM* TIDELAND RECLAMATION PROJECT (STRP) IN SOUTH KOREA AND SUSTAINABLE DEVELOPMENT OF THE TWO TOWNSHIPS IN AND OUT OF THE STRP

A Dissertation

by

IN HUCK CHOI

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2012

Major Subject: Anthropology

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Approved by:

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ABSTRACT

Aging of Development: the *Saemangeum* Tideland Reclamation Project (STRP) in South Korea and Sustainable Development of the Two Townships in and out of the STRP. (May 2012)

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Is the biggest tideland reclamation project in the world (the STRP) sustainable? Since 1991, the STRP which aims at converting mudflats into 401 km^2 farmland and industrial complex has been carried out in the southwestern coast of South Korea. I designed a comparative study between two neighboring rural townships with nearly identical social and ecological features except that one is within the project area and no longer has mudflats, and the other is outside of the project area and has retained its mudflats (an important source of clams). This dissertation answers the question above by comparing, sustainable development indicators and quality of life indicators in the two townships. I expected to find that people living in the township within the project area would be more sustainable because they have gone through with the environment versus development controversy in their own villages and many of them participated in person in protests with the national/local environmental movement organizations.

This study uses one of the best known consumption-based sustainable development indicators (SDIs) - Personal Ecological Footprint (PEF), combined with the ethnographic data from the two townships (*Gyehwa*-township and *Simwon*-township) – to demonstrate that

the PEF values of the two townships appear to be the same and the status of quality of life is quite similar.

As an explanation of the unexpected result, this study contends that the level of sustainable development of the people in the in-project area (*Gyehwa*-township) has been more affected by nation-wide economic development trajectory than by a major regional development project (the STRP). The first stage of the STRP - the construction of the dykes - has brought about a significant effect of displacement, which cannot be said to be sustainable. However, the total influence on sustainable development in South Korea by the STRP will be determined by the progress of the second stage - internal development.

DEDICATION

To my parents

ACKNOWLEDGEMENTS

I would like to thank my committee chair, Dr. Werner, and my committee members, Dr. Dannhaeuser, Dr. Stronza and Dr. Dickson, for their guidance, support, and patience throughout the course of this study.

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However, the real gratitude should be given to the villagers of the two townships – *Gyehwa*-township and *Simwon*-township: YoungSoo Cho, Sung Kwang Choi, Jae Hyung Lee, and many others (all pseudonyms).

Above all, thanks to Edward and Eun Jung and their extreme patience. Finally, without your lifelong support and encouragement, I couldn't finish my study: my mother and farther.

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1. INTRODUCTION

There are two neighboring districts in the western coast of South Korea. The two districts - *Buan* district and *Gochang* district - are very similar environmentally, economically, and socially. However, while one (*Buan* district) has been in the middle of the arguably the biggest tideland reclamation project in the world (the STRP), the other (*Gochang* district) has remained intact during the project period. Which experience of the two areas can be said more sustainable? Using one of the best known consumption-based sustainable development indicators (SDIs) - Personal Ecological Footprint, combined with the ethnographic data from two representative townships of the two districts - *Gyehwa*-township and *Simwon*-township, I demonstrate that, first, despite of the existence of the large scale development project (the STRP) in one township and the absence in the other, there is no difference of the level of sustainable development between the two townships and, second, sustainable development is not so much a matter of regional development path like the STRP. Rather it is a matter of state level industrialization within the globalized world system.[1]

This thesis follows the style of *Current Anthropology*.

[1] Administrative division in South Korea is composed of three levels: 1) '*teukbyulsi*'/'*gwangyeoksi*' (metropolitan city) or '*do*' (province), 2) '*gu*' (borough) or '*si/gun*' (city/district), and 3) '*dong*' or '*eup'/'myeon*' (township). For example, the objects of comparison in this study – *Gyehwa*-township and *Simwon*-township – are the third level and belong to 1) North *Jeolla* province and 2) *Buan* and *Gochang* district. A district usually has a population of 50,000 or below. A district may have more than ten townships. *Simwon*-township is one of the fourteen townships in *Gochang* district. There are administrative offices for these three levels. In rural area, however, there is a fourth level administrative division – '*ri*' (aggregation of several villages), which has no administrative office. A township may comprise about ten '*ri*'s (twenty to thirty villages).

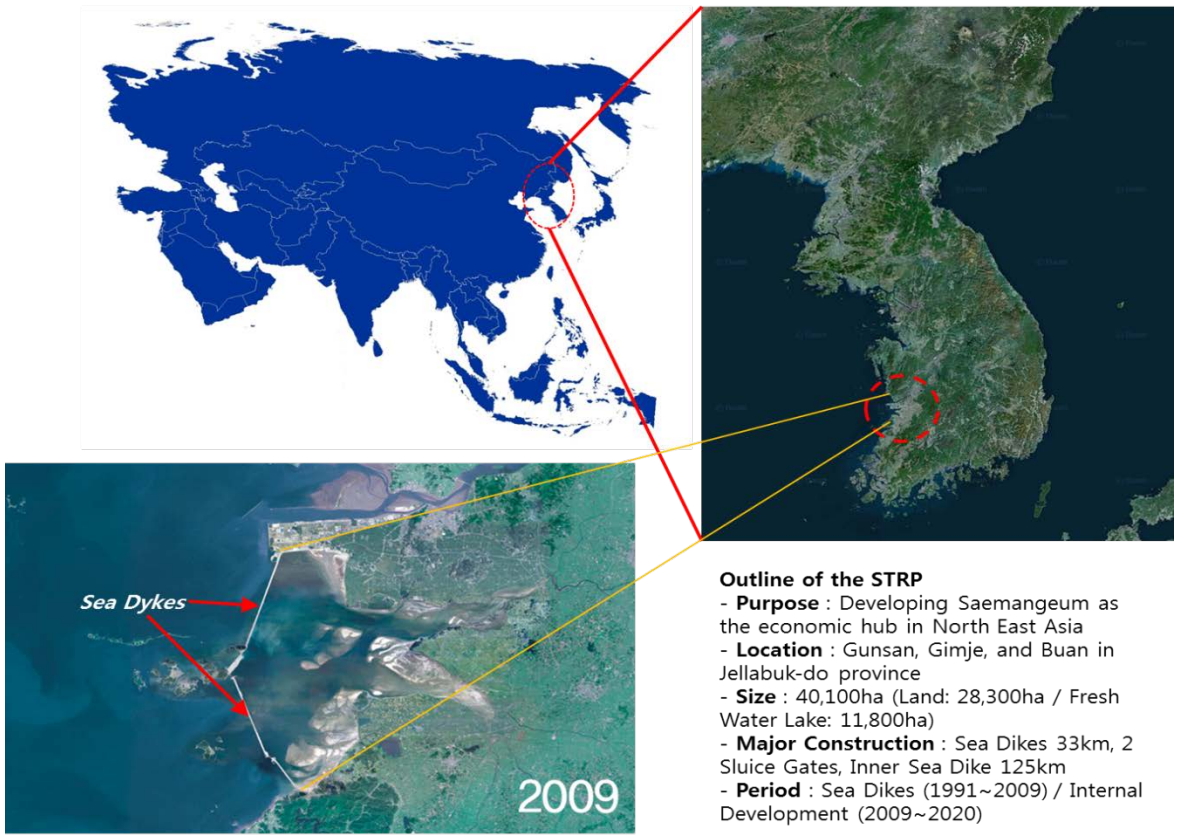

Figure 1. The outline of the STRP. [from KRC *Saemangeum* Project Office (2008b)]

1.1 The STRP: the Biggest Tideland Reclamation Project in the World

Standing on the commanding seascape in the freshly built four-lane highway on the dykes, I could not but be amazed at the spectacle - a gigantic 33 km long structure in the middle of ocean built with more than three trillion KW (about 3 billion $) of investment.[2] This project is expected to create five times the land of New York's Manhattan Island (401 km^2) and is promised to be an environmentally friendly, sustainable or green development for the relatively 'underdeveloped' region (see Figure 1). Visitors at the site easily become supportive of the project as another national 'development' despite the strong opposition of

[2] Throughout this study, I apply 1,000 KW (Korean Won) – 1 US $ (dollar) exchange rate.

Korean environmentalists. I might still be in support of the project if I had not begun my graduate study of sustainable development. The imagined future[3] envisioned vast golden paddies of ripening rice, high-tech green industrial complex and R&D centers, Disney-like theme parks for children, and mega aqua resorts for the tourists. The driving force behind the STRP was the inertia of the economic development – the long-standing preference of visible development projects over natural, therefore undeveloped, surroundings such as the mudflats during the last decades of the compressed economic growth in South Korea. Compared to the imagined return, the disappearance of the hundreds of thousands of migrating birds (whose interim home was the tideland), the deaths of billions of the benthos, halophytes, or fish in the ocean-flat or the suffering of the indigenous people (whose subsistence rooted in the bare-handed catching and gathering shellfish[4] (for example, see Figure 2 in page 5) and other creature in the intertidal zone) seemed small price to pay. Was it?[5]

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[3] Among these imagined future, the most popular ideas during 2004 - 2008 were 'the Dubai Myth' (Heo 2009, Kim 2008, Na and Lee 2008). The incumbent governor of the North *Jeolla* and several presidential candidates for 2007 election race were busy in propagating the myth. Not only proposing the industrial complex, theme parks, or resorts but they also suggested the monuments of the myth such as the highest tower in the world (510m), leisure city bigger than Las Vegas, the aerospace industry, or a carbon-zero city dubbed 'Saemangeum-Amazon'. These pipe dreams burst away with the global financial crises and the bankruptcy of Dubai in 2008. However, still, similar proposals like casino complex continue (Han and Jang 2011).

[4] The species in the STRP area, Venerid Clams (Mollusca, Bivalvia, '백합' - '*Baekhaap'* in Korean, see Figure 2), was famous for its nutrition and taste. Kim (2009) described the taste of the Venerid Clam soup, "the moment when you take a spoonful of it, the savor infiltrates your brain". Five or six year old *Baekhaap* sizes a fist of grown-ups. The STRP tideland was the last large habitat of the clams. Many informants of the *Gyehwa*-township within the STRP area remembered with euphoria the experience of gathering the clams. YongSoon Lee, A 77 year old resident in *Gyehwa* Village, recalled her shell-gathering life, "for more than 40 years, almost every other day, I went to the mudflats, catching *Baekhaap* to rear my seven children. *Baekhaap* reared them, as it were".

[5] Although systems for environmental impact assessment (EIS) had already existed in South Korea as early as 1971, en earnest EIS institution began in 1982 after the installation of the Office of Environment in 1981 (Jung 2009, Yoon 2002). However, it can be said that the EIS institution has become a substantial procedural influence in (especially the public) projects since 1993 after the Office of Environment was promoted to the Ministry of Environment. For the STRP, an EIA report was submitted by the Agricultural Investment Promotion Agency (KOTRA, currently Korea Rural Community Corporation) in 1989 (Jeollabuk-do (North Jeolla Province) 2009, Moon 2000). However, at the time, EIA reports for the national development projects were a formal act or only a perfunctory step. The *Evaluation Report of Environmental Impact of Saemankeum Project* by the Citizen-Government Joint Investigation Team to Assess the Environmental Impact of the Saemangeum Project (JIT) (2000) can be regarded as a true EIA for the STRP. The JIT was composed of 21

To answer this question, we must consider the huge mass of non-renewable resources poured into the structure, the immense amount of carbon dioxide emitted during the construction, and the unquestionable expectation of the carbon, energy, and ecological deficit by the activities in the industrial complex on the reclaimed land which will accelerate the extraction of raw materials somewhere in the world. The insignificant amount of prospective carbon sequestration by growing rice in the part of the created land or making eco parks seems to hardly compensate for the ecological cost. What is worse, would it then bring about the economic prosperity to the region by creating jobs for the local people or distributing the profit to the 'underdeveloped' North *Jeolla* Province?[6] The cost-benefit analysis for the STRP was quite debatable among the economists but it was pointed out that the assumptions of the cost-benefit analysis on which the decision of resuming the project after more than one year suspension of construction owing to the nationwide environmental protests was based were fatally flawed.[7] Often I wonder how powerful and destructive the 'development mentality' among the Koreans has become and how rigid and robust the inertia of the past half century memory of development experiences. I have only a hypothesis but no concrete evidence. How do I know if the STRP is on the right track of sustainable development or more honestly, how can I better approach to the question? However, it would be helpful to

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civilian professional and 9 governmental officials. The JIT Report could not reach an agreement about economic feasibility because of the uncompromising standpoints by both the developmentalists and environmentalists, but it concluded that the STRP would exercise a far-reaching influence upon the environment through its 806 page comprehensive investigation of most aspects of the environment - sea water quality, underwater environment, migrating birds, or benthos. Especially for the migrating birds and life forms in the tidal flats, the report concluded that the construction of dykes had to stop to secure the habitats for them. In addition, the report concluded that the fresh water quality of the planned lake needed comprehensive anti-pollution facilities across the watershed area the North *Jeolla* province to meet the water quality for agriculture.

[6] One of the reasons why the STRP has been carried out was to purse a more balanced development between regions or provinces. North Jeolla province has been regarded as a 'lagging-behind' province in terms of economic growth in South Korea. I will deal with this more in detail later in the Section 1.2.4 and 4.1.

[7] Lee (2001) points out that, the cost-benefit analysis for the STRP is full of misguided judgment as well as logical inconsistencies. According to him, the case can be used a textbook example for how a cost-benefit analysis can be abused for a distorted agenda for development-oriented policies.

sketch briefly the history of tideland reclamation in Korea before addressing the question.

Figure 2. The most important species for the indigenous people in the STRP area - Venerid Clams (Mollusca, Bivalvia, '백합' - '*Baekhaap*' in Korean). [from National fisheries Research & Development Institute (2009)]

1.2 Tideland and Tideland Reclamation in Korea from the Ancient Times to the Present

1.2.1 Tideland in Korea

The Korean peninsula has one of the largest tideland-areas in the world. Tideland or mudflats are one of the important types of complex ecosystem, classified as a form of wetland. According to Mitsch and Gosselink (2000:263), the mudflats in Korea belongs to 'tidal salt marshes' category.[8] The area of the tideland in South Korea (2,489 km^2) is comparable to that of the Netherlands (2,585 km^2) (Korean Tidalflat Information System 2008). The geomorphology of the costal lines in South Korea provides a favorable

[8] Coastal wetland ecosystems can be classified into 'tidal salt marshes', 'mangrove swamps', and 'tidal freshwater marshes' (Mitsch and Gosselink 2000:263).

environment for development of the tideland. Though most of the mudflats in Korea develop towards the open sea, the complicated Rias[9] coastlines give many bays and estuaries along with the rivers that run westwards, which leads to the suitable protection for the tidal areas from storms and waves (Jeon 2005:6, Mitsch and Gosselink 2000:267).

Table 1. The present state of the mudflats in South Korea (Korean Tidalflat Information System 2008).

Province	**Area (km^2)**	**Proportion (%)**	
Total	2,489.4	100.0	
Incheon & *Kyunggi*	872.7	35.1	
ChoongChungnam (South *ChoongChung*)	358.8	14.4	Western Coast - 2,080 km^2
Jeollabuk (North *Jeolla*)	117.7	4.7	Southern Coast - 409.4 km^2
Jeollanam (South *Jeolla*)	1,036.9	41.7	
KyungNam & Pusan	103.3	4.1	

The current state of the mudflats in South Korea is summarized in Table 1. Though tidelands in South Korea provides useful ecological services for the region and subsistence means to some of local villagers, they were regarded as useless for the Korean who were trying to build modern society because the benefits of the mudflats were not visible in economic accounting and living on gathering clams in the mudflats seemed to be an inferior

[9] Ria is funnel-shaped estuary that occurs at a river mouth and is formed by the submergence of the lower portion of the river valley. Generally occurring along a rugged coast perpendicular to a mountain chain, many rias were formed by the rise in sea level after the melting of the vast continental glaciers. The drowning of river valleys along a stretch of coast and formation of rias results in an extremely irregular and indented coastline. The southern and western coastlines of Korean peninsula are famous for their rias coast (Britannica - The Online Encyclopedia , Wikipedia 2011b).

way of living to more industrialized way of life and landscape.[10] After hundreds of year's reclamation of the mudflats, especially after the large-scale reclamation projects in the late 20th century for the industrial complex and agricultural land the coastal landscapes have changed dramatically (see Figure 3). Most of the intact mudflats now remain only in South *Jeolla* province (see Figure 4).

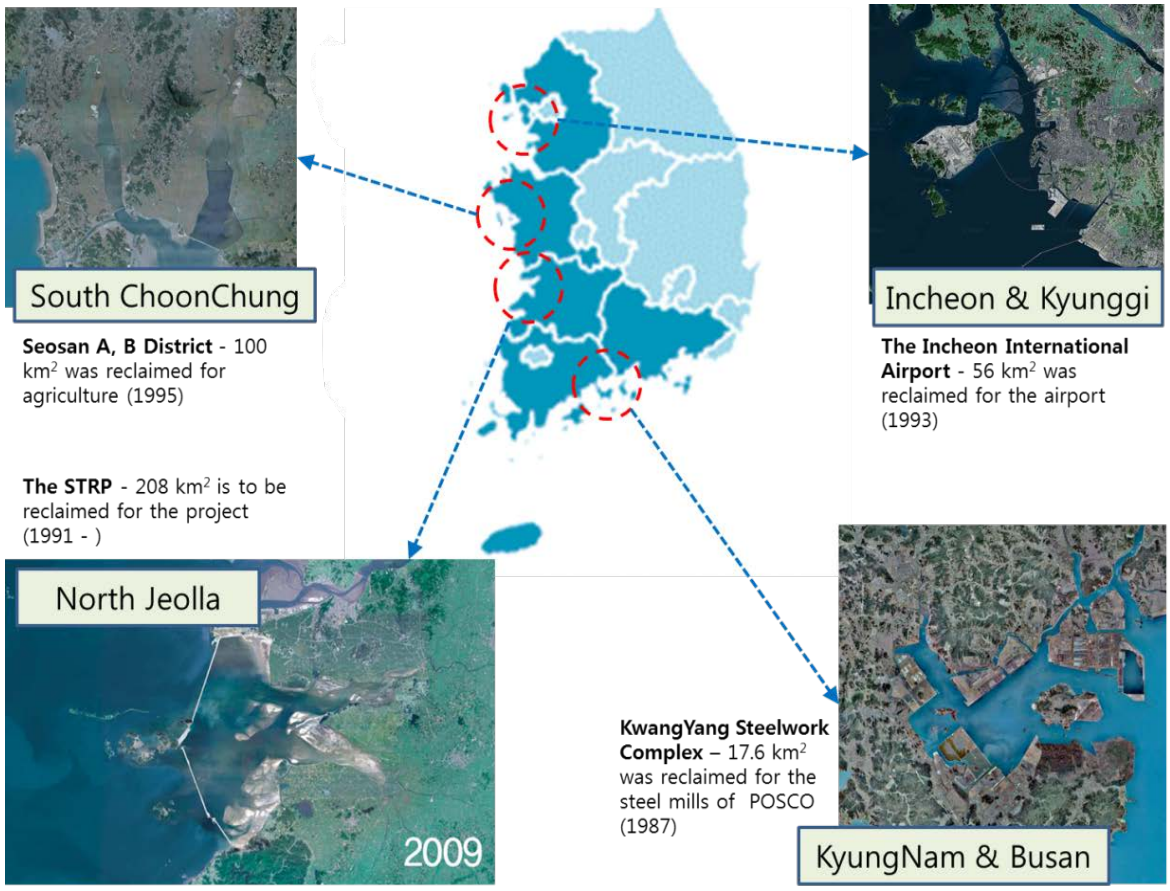

Figure 3. Examples of the large-scale reclamations in South Korea. [maps from Daum™ Maps]

[10] As to the economic evaluation of the tideland, refer to the section 6.4.1 (especially Table 24 in page 178).

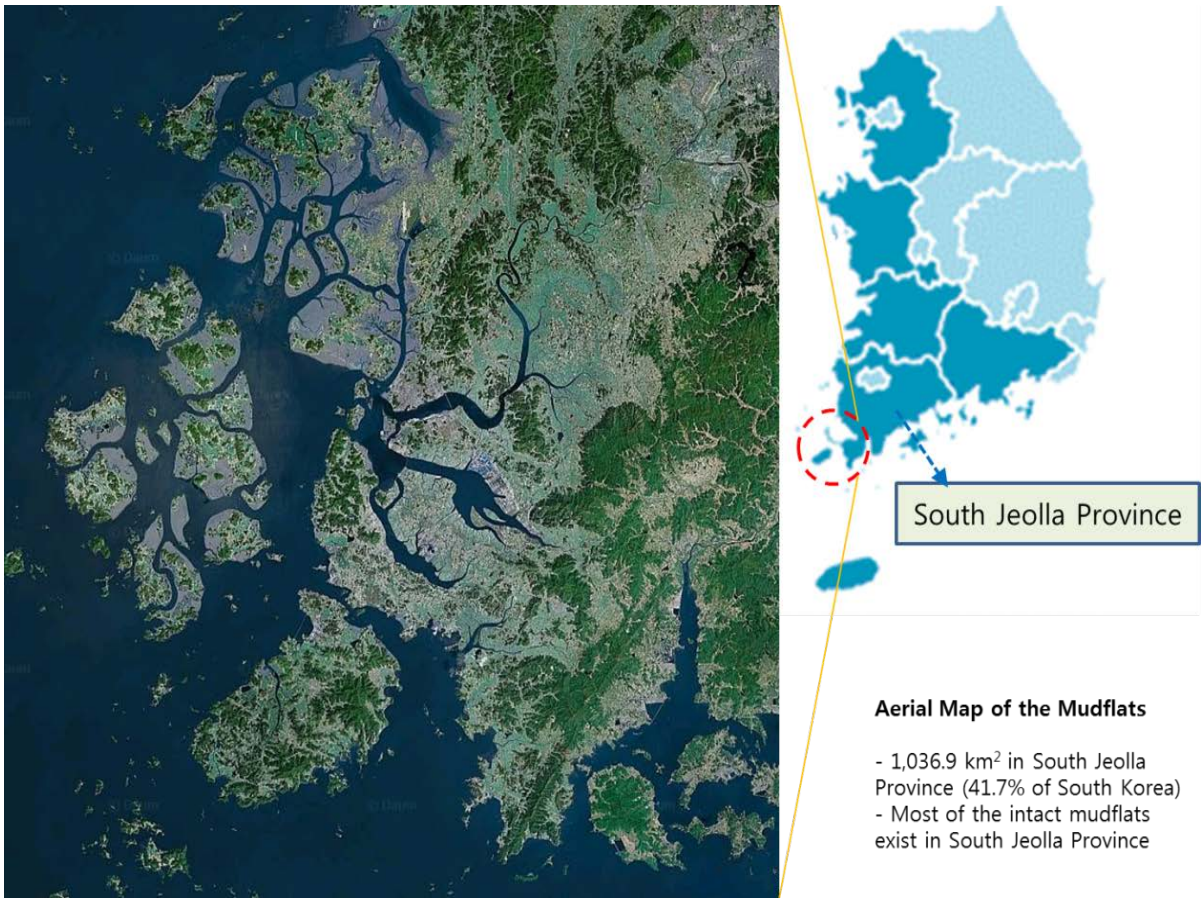

Figure 4. An aerial map of the mudflats in South *Jeolla* province. [map from Daum™ Maps]

1.2.2 Tideland reclamation in Korea (Ancient times to the Japanese colonial period)

With the geomorphologically favorable conditions like high indentation ratio of coastlines, a number of islands, the existence of many rocks/hillocks (providing rocks, gravel, stones and sand with ease and economically) and almost effortless byproducts (automatic creation of the freshwater lakes after reclamation), South Korea has ideal features for the development of the mudflats to maximize the benefits from tideland reclamation. Therefore, it is no wonder that small scale tideland reclamations began as early as 100 B.C. (Moon 2000:103).

The first documented record of reclamation is traced back to the *Koryo* dynasty in 1235 A.D.; however, it was not until in the 16th century in *Chosun* dynasty when the area of paddy rice fields reached its carrying capacity that the reclamations began in earnest (Moon 2000, Park and Oh 2004). Even in this early period of tideland reclamation, unequal distribution of the costs (forced labor mobilization for reclamation and cultivation) and benefits (new rice paddies) of the reclamation was striking. For example, *the Annals of the Chosun Dynasty* reports two negative impacts of a case of reclamation. First, many commoners drowned due to flagrant mismanagement during the dyke construction. Second, people residing near the location were forced to cultivate the reclaimed land as a peasant laborers (Park and Oh 2004:72). Considering the fact that, usually the owners of the newly reclaimed land lived in the political center (Seoul or *Kyunggi* province), the similarity of the socio-ecological aspects in those early reclamation times with those contemporary global debates over unequal distribution of environmental burdens is remarkable.

During the Japanese colonial occupation (1910 - 1945), tideland reclamation was intensified. The sum of the reclaimed area during the period (about 400 km^2) through 178 cases is comparable to that of the STRP. In addition, the institutional and legal development of the reclamation processes by the colonial government has shaped the subsequent tideland reclamation projects in South Korea since 1945. For instance, the Public Waters Reclamation Act enacted in 1920 became the foundation of the law with the same title established in 1962 by the Korean government, which governs the procedures and rights of tideland reclamation (Moon 2000:110).

1.2.3 Tideland reclamation in South Korea (Since 1945)

During the post-war recovery period (1953 - 1960) from the ruins of Korean War, owing to the lack of investment there were not many new tideland reclamation projects except small scale ones and maintenance of the existing facilities (see Table 2).

Table 2. Result of tideland reclamation in Korea (Japanese colonial period) and in South Korea (1945 - 2001). [from (Lee 2002:17-18)].

Term	# of Locations	Area (km^2)
1917 – 1938 (Japanese Occupation)	**178**	**408.8**
1946 - 1960	177	63.3
1961 - 1969	1,136	169.5
1970 - 1979	233	193.7
1980 - 1989	63	93.1
1990 - 1997	16	220.4
1998 - 2001	3	17.7
Sum (1946 - 2001)	**1,628**	**757.7**

The drive towards economic ‘development’ during the industrialization period under the Park Chung-Hee government (1961 - 1979) was unprecedented. So was the numerous tideland reclamations. As shown in Table 2, the number of tideland reclamation projects during this period overwhelms that of other periods. There are two distinctive differences between the Park regime (1961 - 1979) and the later period (1980 -). First, most of the governmental large-scale tideland reclamation projects during the Park regime were carried out by loans from foreign aid such as UNDP (United Nations Development Program),

Japan's OECF (Overseas Economic Cooperation Fund), the IBRD (International Bank for Reconstruction and Development, currently the World Bank), and the WFP (UN World Food Programme) (National Institute of Crop Science (NCIS) 2009). On the other hand, those in the later period (1980 -) was performed by the local investment and the accumulated know-hows about the comprehensive technologies of reclamation. Second, the objective of the former period projects was mainly devoted to create new paddy fields, whereas the successors in the latter period became diversified, including industrial complexes. At long last, at the very end of the long list of reclamation history in Korea, the biggest and the most ambitious ever - the STRP, entered the stage in 1991.

1.2.4 The progress of the first stage of the STRP: 1991 - 2006

The possibility of the STRP had been discussed since the 1970s but its actual inception in 1991 occurred as part of the dynamics of the political economy through the democratization in the late 1980s. The strategy of the Park regime for economic growth in the 1970s and that of the military regime in the 1980s was based on the unbalanced growth theory by investing in focused industrial regions, which was supposed to spread to other regions. Contrary to the intention of the government, the concentration of the economic power along the Seoul-*Pusan* line prevailed against the spread effect (see Figure 5). Except *GangWon* province, *Honam* resion (North and South *Jeolla* provinces) has been averted by the primary spatial development projects.

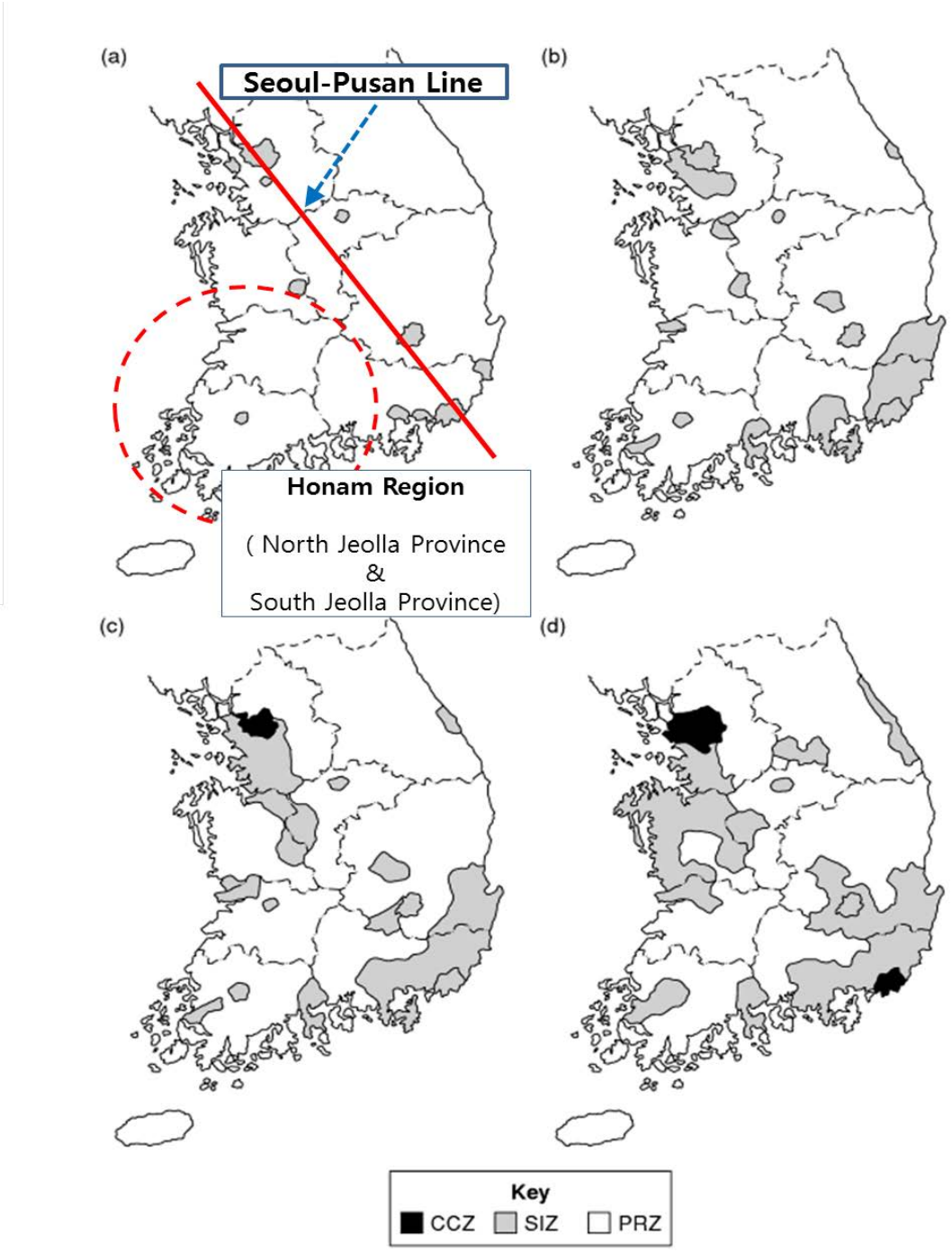

Figure 5. Historical development of space in Korea. Note 1: (a) 1962-70; (b) 1970-79; (c) 1980-87; (d) 1988-97
Note 2: CCZ = Core consumption zone, SIZ = Semi-peripheral industrial zone, PRZ = Peripheral rural zone.
[adapted from Chung and Kirkby, Figure 3.7 (2002)]

Restrained complaints and demand for correction to such spatial disparity erupted through the late 1980s democratization period. Political leaders took advantage of the

regional animosity[11] to win elections - especially the presidential election in 1987 and 1992. The ruling party at the time hastily had a ground-breaking ceremony in November, 1991 to win the people in *Honam* region in the coming election. However, the STRP couldn't go smoothly unlike its predecessors due to the first time ever full-awakening of environmentalism in South Korea during the 1990s.

Regarding general tideland reclamations, what sparked the public awareness of the possibility of the environmental disaster caused by them was the *Shihwa* Tideland Reclamation Project (1987 - 1994). The project was a typical tideland reclamation project about one tenth size of the STRP in *Kyunggi* province. However, around 1996, within two years of beginning to store fresh water after completion of its dyke, the newly created *Shihwa* freshwater lake turned into a dead lake. After several years desperate effort to save the lake from pollution by pouring money comparable to the construction cost, the government canceled the freshwater lake plan in 2001 and decided to manage the lake as a seawater lake, which meant to abandon the original objective of the project (Hong 2004:123).

The tragedy of the *Shihwa* lake catalyzed the nation-wide concerns about the STRP. Would it follow the similar disastrous path as the *Shihwa* Tideland Reclamation Project? The supporters of the STRP discarded the possibility of the STRP becoming a second *Shihwa* based on the size of the planned lake (ten times larger than the lake of the *Shihwa* project)

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[11] It is also called 'regional rivalries' or 'inter-regional antagonism'. Dramatic result of the three presidential elections - the first democratic presidential election in 1987 and two subsequent elections in 1992 and 1997 - was determined, at least partly but significantly, by the regional rivalries between southwestern *Honam* (North and South *Jeolla* provinces) region and southeastern *Youngnam* (North and South *Kyungsang* provinces) region. Kim (1999) shows that Koreans reveals strong regional rivalries in the presidential elections whereas their regional animosity is not apparent in other social arenas such as marriage, private association, trade partnership, or money transaction, employment and promotion. Discrimination against *Honam*, according to some historians, has rooted in political power for hundreds of years. J. Lee (2008) shows that, already in the 18th century, the intellectuals in *Honam* region deplored such discrimination through limiting the opportunity of public office appointment to the *Honam* people, based on the prejudice that the personality of the *Honam* people was base and depraved.

and the advanced technology and practices for water quality treatment.[12] Moreover, even if there would be unavoidable environmental impacts, the economic benefits from newly reclaimed land would easily eclipse such negative consequences. Economists, policy makers, and politicians stood by the STRP. On the other hand, the opponents of the STRP, those who were the national/local environment movement organizations associated with local villagers (mainly barehand clam gatherers), contended that not only the STRP would bring about another ecological disaster but it also would not be able to deliver the expected economic benefits. Ecological value of the mudflats and the intrinsic value of the every life form of the tideland were the basis for the coalition of the various groups of the opponents.[13]

Over the heated debates over environment versus development and the vivid example of environmental disaster of the *Shihwa* Tideland Reclamation Project (1987 - 1994), the STRP repeated halting[14] and resuming. Finally, by the Supreme Court's ruling in favor of the continual of the project in March, 2006, the first stage of the STRP - the construction of the dykes - could be completed in April, 2006. The planning for the second stage of the project - the internal development - is still in progress as of 2011. The STRP controversy seems to have lost its attractiveness during the tedious judicial procedures.[15]

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[12] Some of the supporters of the STRP even argued that the STRP would provide environmental benefit by protecting the hinterland of the project through the constructed dykes, which could keep the harmful impact of the storms or typhoons at bay.

[13] As explained in footnote 5, the official report to summarize the arguments of both the supporters and opponents of the STRP is the *Evaluation Report of Environmental Impact of Saemangeum Project by the Citizen-Government Joint Investigation Team to Assess the Environmental Impact of the Saemangeum Project* (JIT) (2000).

[14] The first was the establishment of the Citizen-Government Joint Investigation Team to Assess the Environmental Impact of the Saemangeum Project in 1999, which caused one year stoppage. Secondly, the court ruled to suspend the project in 2003 by approving the petition by the environmental movement groups.

[15] From the engineering point of view, the completion of the dykes seems to have a ratchet effect. Before the completion of the dykes, the main goal of the opponents of the STRP was to stop finishing the dyke construction. Once the dykes had been built, the focus of the debate over the STRP moved to how the second stage of the project (internal development) should be approached. Not only did the issue change, but the participants of the debate before the dyke completion also seemed to lose their passion.

However, despite its contribution to the enlightenment of sustainable development in South Korea, the real question regarding sustainable development has never been asked. Has the STRP itself been sustainable? How do we know that? What approach can be appropriate to approach such question?

1.2 The STRP: Is It Sustainable?

The existing studies on the STRP with regard to sustainable development lack, among others, the context of their analyses – the people in the project area.[16] On the other hand, the ethnographic studies of the project do not incorporate the context (people's life) with the issues of sustainable development.[17] In search of a better approach, I decided to adopt anthropological methods of participant observation along with others centering around the theme of sustainable development. I visited *Buan* District - one of the three districts/cities of the STRP area (*Buan* district, Gimje city, and Gunsan city) - for the first time in 2004 winter to conduct interviews for my thesis. Also I visited one of the most heavily impacted townships by the STRP within *Buan* district - *Gyehwa*-township. To visit *Gyehwa*-township

[16] Many existing and new research institutes and individuals began studies focusing on the STRP. Many of these studies concentrated on the environmental impact studies such as water quality (or its improvement methods) and the change of the coastal or ocean ecosystem. For example, the Saemangeum Environmental Research Center (SERC) was founded by the researchers of oceanography, environmentology, chemistry, chemical engineering, and material science. Economic feasibility of the STRP was another focal point of research. J. H. Lim (2000) argues that even one of the fourteen expected benefits of the STRP - 'national land expansion effect' - can reach 8.4 ~ 14.1 trillion won (about 8 ~ 14 $ billion). The experts in opposition groups not only criticize the result of the B/C analysis but they also raise the issue of distortion of the academic methods for supporting the project (Lee, Kim, and Ma 2001, Lee 2001). There are several works that reflect the advancement of the new governance in pursuing state-level development projects. M. S. Kim (2002) suggests 'deliberative decision-making' based on discussion and consensus to pursue national development projects and Nam (2005) describes the role of NGOs shown in the STRP as an advanced governance model. There are various other approaches to analyze the STRP controversies, too. To name a couple, there is a study of media framing of the STRP (Kang 2002) and a legal analysis of the project (Jeon 2003).

[17] As to the more detailed discussion about the ethnographic studies in the STRP, refer the next section, '2.1 Ethnography of Sustainable Development'.

from the centers of the world-system, one has to experience several time-space warps. Airline, bus/subway, express bus/train, local bus and walking. To me, the psychological distance from Seoul (the capital of South Korea) to *Gyehwa*-township was comparable to that of the real distance from Korea to USA. Although South Korea is a member of OECD and G20, which may convey the expression that South Korea is already regarded as an economically advanced or developed country, *Gyehwa*-township gave me the first impression of a terminal periphery of an tertiary periphery (*Buan* district) of the most underdeveloped intermediary periphery (North *Jeolla* Province) of an advanced peripheral center (Seoul) of the world-system. When I first took a view of tidal flat on the old dyke at the western edge of *Gyehwa*do (or *Gyehwa-ri*, one of the villages in *Gyehwa*-township), I was awed by the sight of endless mudflat towards horizon covering tens of hundreds hectare of the intertidal zone. That was also a spectacle, though totally different from that of the ocean dykes constructed by the STRP. Nature! In the classic meaning of the term.

However, soon I realized that, most of the *Gyehwa*-township itself is an artificial construct created by another tideland reclamation project - Dongjingang Project (1963 - 1977)[18]. The experience of seeing a vast rice paddy plain almost towards horizon in *Gyehwa*-township is very rare on Korean peninsula (see Figure 6). To realize that this plain is a built environment was stunning. This large scale anthropogenic socio-ecological system has been sustainably maintained for the past forty to fifty years. Why not another one, even much bigger scale, considering the technological innovations and economic advancement?

[18] Dongjingang Tideland Reclamation Project (1963 - 1977) is also called as '*Gyehwa*-do Tideland Reclamation Project, because it was aimed to reclaim the mudflats between *Gyehwa*-do (*Gyehwa* Island at the time) and the old shoreline of *Buan* district. Henceforth, the project will be referred to GTRP.

Figure 6. The rice paddy plain in *Gyehwa*-township. Each rectangular field is a 0.5 hectare zone, 100m by 50m. The mountain at the end is the home for the village of *Gyehwa*-do and was an island before the rice paddy plain was reclaimed. [from Google Earth™]

The success of a similar project as the GTRP in this area was one of the strongest reasons for building an even bigger project. I also began my long journey of sustainable development study of the STRP with a mix of 'why-not' sentiment and 'nonetheless not any more' hunches. Since 2004, almost every summer, I have visited the township from a few days to a week while establishing friendship with a few local informants. My first work on the sustainable development issues about the STRP was based on the interviews of fifteen professionals including two local informants. This work was the basis for my M.A. thesis at Texas A&M University - *Awareness of Sustainable Development: Why Did the Saemangeum Tideland Reclamation Project Lead to the First National Controversy over Sustainable Development in South Korea? (Choi 2006)*. Conclusions of this work are as follows:

> First, twenty one aspects or characteristics of sustainable development awareness in a society are extracted from the history of

> sustainable development, theories and practices on sustainable development, and sustainable development studies in anthropology. They compose the List of Indicators of Sustainable Development Awareness (LISDA).[19]
>
> Second, a historical review of tideland reclamation in Korea and key informant interviews about the STRP show that the STRP became the first national controversy over sustainable development. Out of the twenty one aspects of the LISDA, eighteen show evidence of appearances during the first stage of the STRP (1991 - 2006) in South Korea.

Regardless of whether the STRP is itself a successful example of sustainable development or whether it helps make South Korea more sustainable, it is certain that the STRP at least brought about the full awareness of sustainable development in South Korea. Naturally, the next question of my study on the STRP is: "Is the STRP sustainable?"

That is why I wondered what aspects of living in *Gyehwa*-township by the STRP changed and to what extent had they changed. As I learned, disappearance of the licensed fishing industry and barehanded shellfish gathering would be the most significant change in the human eco-system interaction patterns.[20] A number of macro indicators such as regional gross domestic product (RGDP), farmers' cooperatives' loans, the status of electricity, water supply, medical services, social welfare, waste management, education, etc. could tell something significant about such changes in the region. Do they show that the daily life of the people has become more sustainable or the opposite? Or, hundreds of sustainable

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[19] LISDA includes: a) Appearance of the voice for the rights of future generations in terms of the environment and development, b) Advancement of environmental discussions beyond the level of antipollution campaigns, c) Popularization of the debates on the relationships between the environment and economic growth, d) Appearance of governmental or non-governmental organizations which incorporate sustainable development concept into their core slogan or charter directly or indirectly. For the whole list, refer to Choi (2006).

[20] There were reasonable, at least in terms of overall procedures, compensations for the loss, even if many controversies, conflicts and lawsuits occurred. Refer to the official white paper (Jeollabuk-do (North Jeolla Province) 2009). Concerns about the methods and procedures of the compensation, see Kim et al. (2006) and also Hahm (2004). This will be dealt with more in detail in the later chapters.

development indicators (SDIs) proposed during the last two decades, for example, the Human Development Index (HDI), the Environmental Sustainability Index (ESI), the Genuine Progress Index (GPI), ecological footprint (EF) analysis, or more than eight hundred schemes of sustainable development indicators deposited in the International Institute for Sustainable Development (IISD), can they?[21] To measure sustainable development is a matter of how to arrange the relations between collective actors, which produce data of stocks and flows that can be manufactured into a number, aggregate of numbers or other forms of indicators, which can be interpreted along a range from totally sustainable to totally unsustainable depending on who construct the statistics, who uses them, or what is his or her philosophy. However, in order to measure sustainable development in the context of the 'individuals' in *Gyehwa*-township through the STRP period, the sustainable development indicator should have at least certain objective features: first, quantitative for both individuals and the state (South Korea); second, comparative across time at least from 1991 to the present; third, applicable to the fieldwork in which data for the measure will be collected among the lay people through the ethnographic methods such as survey or interview.

As my sustainable development indicator (SDI), I decided to use the Personal Ecological Footprint (PEF). Ecological footprint (EF) is defined as the aggregate area of land and water in various ecological categories that is claimed by participants in an economy to produce all the resources they consume, and to absorb all their wastes they generate on a continuous basis, using prevailing technology (Wackernagel and Rees 1997:7). This aggregated area of land in the country is converted to a universal metric – 'global hectare' (gha), which allows the quantitative comparison between countries. Personal Ecological

[21] To the Compendium of Sustainable Development Indicator Initiatives of IISD, 894 Sustainable Development Indicator (SDI) initiatives have been submitted so far, as of October 14, 2011. Visit their web site: http://www.iisustainable development.org/measure/compendium/searchinitiatives.aspx

Footprint is the area necessary to meet the demand of the consumption of an individual in this particular country. Although my decision to use Personal Ecological Footprint has practical reasons[22], the whole point is not to present the resultant Personal Ecological Footprint value but to reveal the relations between collective actors (who can be domestic, international, and global) that produces the specific Personal Ecological Footprint value in *Gyehwa*-township. The quantitative feature of Personal Ecological Footprint seemed to me a practical starting point in dealing with the aspects of living of the people in *Gyehwa*-township.

If Personal Ecological Footprint is used as the sustainable development indicator (SDI) to assess the ecologically impacted township (*Gyehwa*-township) by the STRP, what about using it to assess a non-impacted township for comparison? If we can find an unimpacted township, this will allow us to use the static group comparison research for evaluating a natural experiment caused by the STRP (Bernard 2006:126-7). A neighboring district, *Gochang* district, is located just to the south of *Buan* district (see Figure 7). Investigation of the statistical attributes of the two districts disclosed surprising similarity between them. In terms of township - the scale of the ethnographic fieldwork in this study - among the fourteen townships within *Gochang* district, *Simwon*-township has the most comparable ecological environment: the large area of tidal flat as well as enough rice paddy field to support fishery and agriculture as two main subsistence activities among the residents of the township. There is one stark contrast, however, between the two townships (*Gyehwa* and *Simwon*) and also between the two districts (*Buan* and *Gochang*): one (*Gyehwa*-township or *Buan* district) has

[22] First, EF is one of the most used, researched, and vigorous indicators of sustainability. Second, not only does EF provide the global, state-level measurement, but it also gives metric for the individual (Personal Ecological Footprint) based on the same analytical scheme and data. Third, Personal Ecological Footprint is handy and can be instantly calculated in the web site:
http://www.footprintnetwork.org/en/index.php/GFN/page/personal_footprint/

gone through with the STRP losing its whole tideland area and its two primary sustenance means (fishing and shellfish gathering) while the other (*Simwon*-township or *Gochang* district) has survived the development fever and successfully maintained its tideland resources and fishing industry.

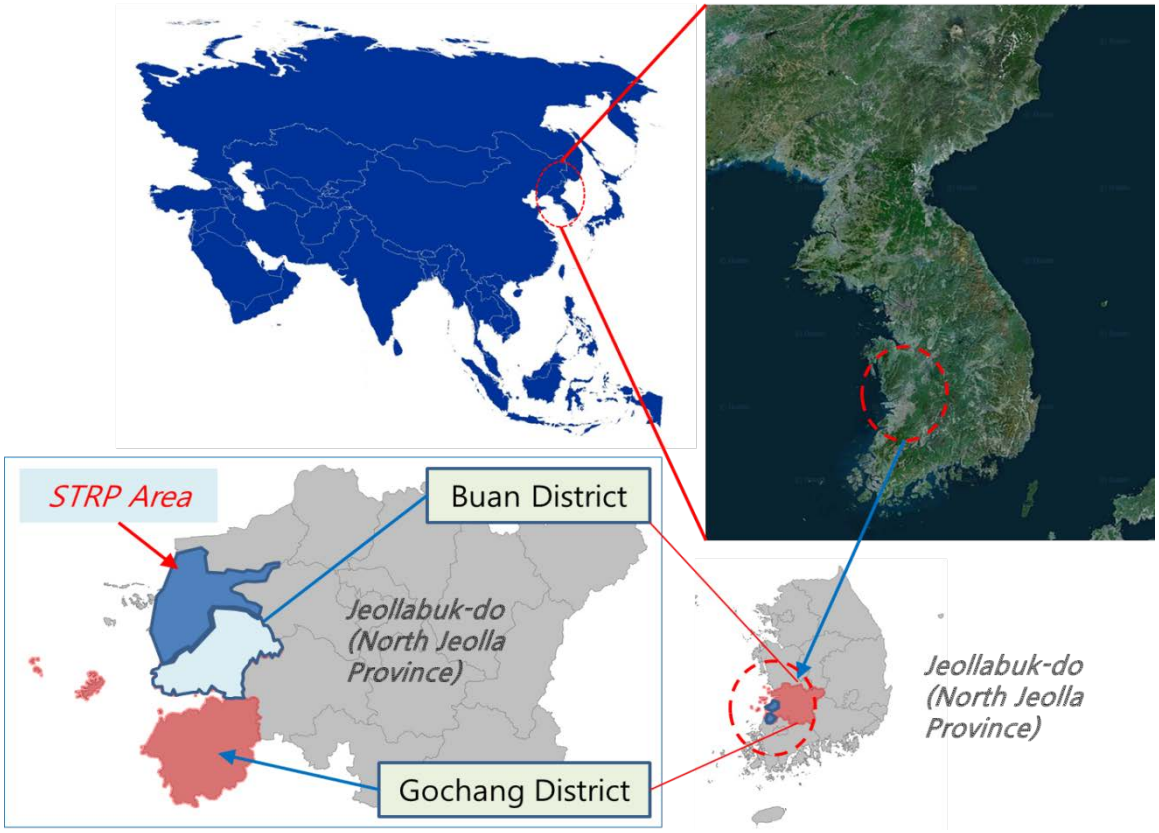

Figure 7. The two districts: *Buan* district and *Gochang* district

1.3 Two Townships: The Key to Understand the STRP

At first sight, the two districts seem to be twins with the exception that *Gochang* district is more mountainous and therefore it has more dry paddy and forest field, illustrating in Table 3. The single most marked environmental difference is caused by the removal of the

majority of tideland in *Buan* district due to the STRP.

Table 3. Comparison of the key attributes of Buan district and Gochang district[23]

Base Year	**Key Attributes**	***Buan* district**	***Gochang* district**
2009	Area (km^2)	607.71	493.04
2009	Population	60,668	60,661
2009	Household	27,144	27,201
2009	Forest Field (km^2)	267.52	201.74
2009	Dry Paddy Area (km^2)	91.62	54.75
2009	Rice Paddy Area (km^2)	142.96	145.44
2008	**Tideland Area (km^2)**	**17.00**[24]	**74.00**
2009	Grain Production (MT)	91,127	96,307
2009	Vehicle Registration No.	21,650	22,332
2009	Residential Electricity Consumption per capita (MWh)	1.04	1.07
2009	Number of Medical Facilities	57	54
2009	Registered Handicapped	5,509	5,624
	Schools	67 (2009)	64 (2010)
	No. of Students per Teacher	10.4 (2009)	10.6 (2010)
2010	Number of data[25] in the public libraries	76,210	77,575

[23] All data come from each district office except the tideland area (from Ministry of Land Transport & Maritime Affairs (MLTMA)). Refer to *Buan* District Office - http://www.*Buan*.go.kr/01kr/02open/open04/02/index.jsp, *Gochang* District Office - http://www.*Gochang*.go.kr/hengjung/tonggye/*Gochang*.php?main=3&sub=5, and the MLTMA - http://www.tidalflat.go.kr/korean_flat/status.asp

[24] Before the STRP began, the area of the tideland inside the project site was measured 208 km^2. Out of it, about 60 ~ 70 km^2 was supposed to belong to *Buan* District. The current 17 km^2 is located outside the STRP area.

[25] Most are books. Some of data exist as a form of multi-media such as CDs, DVDs, and digital audio/video files.

The loss of the tideland in *Buan* district is concentrated in the *Gyehwa*-township, where officially 100 % of its tideland (probably amounting to 30 ~ 40 km^2) was removed. This is in contrast with *Simwon*-township, where 41 km^2 of tideland area remains. Therefore, in order to study any influence in terms of sustainable development caused by the STRP, one should look into the two townships: One in the heartland of the STRP (*Gyehwa*-township, treatment group) and the other isolated from it (*Simwon*-township, control group).

1.4 Sustainable Development: a Working Definition

"There are almost as many definitions of sustainable development as there are writers who contemplate it" (O'Riordan and Voisey 1997:4). Reluctantly, this study suggests another one: sustainable development is the '***decrease of Personal Ecological Footprint while improving or maintaining the quality of life***'. This should be relevant to the most of contexts of sustainable development discussion because it expresses both the ecological sustainability (decrease of Personal Ecological Footprint) and the better part of development (improving or maintaining the quality of life).[26] Most of all, the straightforwardness and quantitative feature of Personal Ecological Footprint will be beneficial to the comparison of the two townships. Calculated as the required area of equivalent global hectare to meet the demand of a particular individual in a particular country, ecological footprint is one of the most widely used indicators for sustainable development. If the value of Personal Ecological Footprint of

[26] With this definition of sustainable development, the objective of this study - focusing on the 'individuals' of the two comparative townships through the ethnographic methods - inevitably brings forward the matter of measure of the quality of life, which has been usually regarded as subjective, complicated, or vague, i.e., troublesome. However, recent advancement in quality of life researches (representatively, for example, Stiglitz, Sen, and Fitoussi (2009)) shows how irrelevant and meaningless it is if quality of life is dealt with without consideration of sustainability and vice versa.

one is noticeably lower than that of the other and the aspects of living of the two are similar, one can tentatively conclude that the former's life style is more sustainable than the latter.

1.5 Research Question

The foregoing discussion makes clear the research aim of this study: to determine whether the STRP is sustainable, by designing a natural experiment using the two townships (Table 4).[27]

Table 4. Natural experiment design of the two townships

		Assignment	Pretest	Intervention	Posttest (2010-2011)
Group 1 (treatment group)	*Gyehwa*-township	None	N/A	The completion of the dykes of the STRP in 2006	PEF
Group 2 (control group)	*Simwon*-township			None	PEF

Then, based on the definition of sustainable development (decrease of Personal

[27] Given the environmental controversy over the STRP, one might argue that the STRP would lead to less sustainable in a certain form of definition of sustainable development because of the apparent destruction of an ecosystem – the mudflats. However, based on the definition of sustainable development in this study – the Personal Ecological Footprint (PEF) and the quality of life, I expected that the STRP had affected *Gyehwa*-township towards the lower value of the PEF. There are two reasons in this expectation: first, the lower PEF value owing to the income decrease through the loss of their part of livelihood (from the tideland) and second, the lower PEF value due to the sustainable development awareness or general environmental awareness by participating long in the controversy over the STRP, compared to the PEF value in *Simwon*-township. More in detail in the Section 4.2.3.

Ecological Footprint while improving or maintaining the quality of life) in this study, the research question becomes "Is the value of Personal Ecological Footprint in *Gyehwa*-township different from that of Personal Ecological Footprint in *Simwon*-township?". Here a number of assumptions are made. First, in this design of static group comparison, the study is open to what Bernard (2006) calls unresolvable 'validity threat'. This is due to the fact that the researcher has no control over the assignment of participants. A way to minimize the threat will be to verify the residence of the participants before and after the intervention. Second, it is assumed here that the two groups had the same Personal Ecological Footprint before the intervention but there is no way to check this directly. This study will use previous studies done in this area and data from the 1980s and 1990s to bolster this assumption. Third, the main assumption is, if the values of Personal Ecological Footprint of the two townships were different, it should have been caused primarily by the intervention of the STRP. However, there are other possibilities besides statistical errors. For example, because of the logistical reason, the fieldworks in the two townships could not be conducted simultaneously; in other words, the fieldwork in *Gyehwa*-township was conducted mainly in summer season while the fieldwork in *Simwon*-township was done in winter. Therefore, the components of Personal Ecological Footprint should be carefully looked into and may need a seasonal calibration. Presuming that those risks can be minimized, the first research question is,

> Research Question: Is the STRP relatively more sustainable enough to make the value of PEF in *Gyehwa*-township lower than that of PEF in *Simwon*-township? Or is the STRP relatively less sustainable and therefore it makes the value of PEF in *Gyehwa*-township higher than that of PEF in *Simwon*-township?

Moreover, as a sub-question of the Research Question, one may ask, "what factors (among

such as gender, age, length of residence, etc.) are most contributive to the difference?" Such factors may have been more perceptive to the impacts by the STRP.

However, what if there is no statistically significant difference between the Personal Ecological Footprint values of the two townships? If this is the case, one possibility is that, even though the Personal Ecological Footprint values are not different, the quality of life in the two townships varies. Therefore, it can be concluded that the STRP is (un)sustainable because it raised (or lowered) sustainable development not by impacting Personal Ecological Footprint but by influencing quality of life only. Ethnographic participant observation will be helpful to assess this possibility. Let me be clear about the reasoning so far (see Table 5).

Table 5. Research outline

***Gyehwa*-township**	***Simwon*-township**
Inside of & impacted by the STRP	Outside of & isolated from the STRP
Loss of most tideland	Tideland remains intact
High disruption of socio-ecological system	Low/no disruption of socio-ecological system
↓	
Comparison of the PEF values (Research Question)	
↓	
Difference in PEF	No difference in PEF
Case-I	Case-II
	Comparison of the ethnographic data

1.6 Outline of the Study - Research Procedures

To answer my research question, this study utilizes following procedures. First, in Section 3, the concepts, indicators, and other tools to analyze data from the fieldwork will be extracted from the existing works of sustainable development. Here, special attention will be paid to the meaning of sustainable development to individuals. Second, in Section 4 and 5, using concepts developed in Section 3 and the ethnographic data centering on the Personal Ecological Footprint analysis, the two townships will be analyzed. This will lead to the determination whether the impact of the STRP on local community is best described by the scenarios presented as Case-I or Case-II. Third, in Section 6, based on the analysis of the Section 4 and 5, I will describe the STRP from a sustainable development perspective, which makes sense only in the context of the trajectory of 'development' in South Korea.

1.6.1 Section 3 - Organizing a toolbox for a sustainable development study

In this section, I will review a) mainstream sustainable development discourses, b) theoretical issues of sustainable development in the academic circles, and c) sustainable development related works by anthropologists. From the review, I'll extract a few sets of practical tools - a combination of concepts and their application such as indicators or analytical steps - to be used to explore ethnographic data. Special attention will paid to how sustainable development discussions can be translated into the informants' emic world. The toolbox composed here will be utilized to develop a method for evaluating quality of life, and thus to determine whether the impact of the STRP is best described by scenarios presented as Case-II.

1.6.2 Section 4 and 5 - Comparison of the two townships: Personal Ecological Footprint and other data

The result data from the surveys in the two townships will be analyzed through 'the independent samples t test' and 'single or multiple linear regression' by the statistics software package SPSS™. This will lead to the determination of Case-I or Case-II. Data from the interviews and participant observations will be used for Case-II. To interpret these ethnographic data in terms of sustainable development, the toolbox for sustainable development composed in the Section 3 will be used. From the central question of this study, if the STRP has been (un)sustainable enough to make the value of Personal Ecological Footprint in *Gyehwa*-township lower (higher) than that of Personal Ecological Footprint in *Simwon*-township, what has brought the changes in the lives of *Gyehwa*-township? To investigate this question, my sample will be used to test following hypotheses:

> i) Non-immigrants (those who had lived in the *Gyehwa*-township before GTRP began and have lived until now) and their descendants[28] will have a lower score on Personal Ecological Footprint than the immigrants to the region (those who immigrated after the beginning GTRP). This hypothesis is based on the idea that those who are the indigenous group in the STRP area are likely to be more conscious of sustainable development issues than the immigrants.
>
> ii) Younger residents will have a lower score on Personal Ecological Footprint than older residents. This hypothesis assumes that younger residents have more access to international trends about sustainable

[28] The GTRP (1963 - 1977) was not a single project. The embankments were constructed first by 1968 and the internal reclamation of land (2,467ha) was done during 1974 - 1977. The migration to the new reclaimed land scattered through the whole period. However, the first area of 241 ha reclaimed land was developed in advance with the construction of the embankments (Moon 2000). Therefore, in this study, the immigrants are defined as a person who immigrated to the township owning to the GTRP and those who moved to the township after the GTRP finished. Non-immigrants are defined a person who had resided in the township before the GTRP began and those who regarded themselves as the indigenous people in the township and their descendants.

> development, are more willing to have affiliation with environmental movements, and are more critical to development ideology of the previous rapid economic growth period - from 1960s to 1990s in South Korea.[29]
>
> iii) Female residents will have a lower score on Personal Ecological Footprint than male residents. This hypothesis assumes that female residents are likely to be more concerned with sustainable development issues because they have more experienced in subsistence activities in the tideland. For example, Park (2003) and Hahm (2004) show that the sustainable clam gathering was a mainstay among women while men were engaged in fishery or rice farming in the *Saemangeum* area. From the state level survey of Korean people, Jeon, Shin, and Ha (2002) show that females pay more attention to the non-use value (such as ecological functions and public interests) of the tideland whereas males regard the use-value (such as economic products) of the tideland as more important.

In addition, other features of sustainable development-related features in the lives of people will be considered. The management of tideland as what Ostrom (1990) calls 'common-pool resources (CPR)' by villages or organized (formal or informal) mutual help institutions among village people are such examples.

1.6.3 Section 6 – Interpretation of the correlation between sustainable development and the STRP

The results in Section 4 and 5 will indicate whether the STRP has contributed to the improvement of the level of sustainable development within the project area compared with the outside of the project area. For example, the Personal Ecological Footprint survey result may show that the average value of it in *Gyehwa*-township is lower than that of *Simwon*-

[29] This hypothesis is not contradictory to the first hypothesis. The indigenous group (non-immigrants) is composed of both younger and older generations as the immigrant group is composed of both younger and older generations. In other words, the indigenous group (non-immigrants) is not necessarily older people and the immigrants are not necessarily younger generation. Refer to Table 7.

township. This, of course based on the definition of sustainable development in this study, means that the STRP has functioned as a sustainable-development-friendly mechanism if the comparison of quality of life between the two township shows insignificant difference. But does it?

In the mainstream trend of sustainable development research, there are two contrasting economic paradigms of sustainable development – 'weak sustainability' and 'strong sustainability'.[30] While the advocates for weak sustainability believe that what matters to sustainable development is only the total aggregate stock of both human and natural capital (and possibly other forms of capital as well) regardless of the change of the portions of each constituent capital, the defenders of strong sustainability claims that natural capital should be regarded as non-substitutable in its both source side of economy and sink side (its capacity to absorb pollution or carbon dioxide emission) (Neumayer 2010:1-2). In other words, if the result of this study shows that the STRP has helped keep the higher level of sustainable development within its project area compared to a non-project area, that can be interpreted as a case that supports 'weak sustainability'. Otherwise, the case of the STRP can be regarded as supporting 'strong sustainability'.

Similarly, based on the tools of sustainable development which will be developed in Section 3 through the existing sustainable development studies, the results of this study can also be interpreted to advance the understanding of other aspects of sustainable development issues, both practical and theoretical. One of such broader interpretations of this study, I hope, should be the relationship between the STRP and the state level trajectory of sustainable development during the last half century.

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[30] For one of the best reviews on this topic, refer to Neumayer (2010).

2. FIELDWORK AND METHODOLOGY

2.1 Ethnography of Sustainable Development

For the study of sustainable development, what can ethnography do? What can the learning by interacting directly with a cultural group contribute to the understanding of the complicated matter of sustainable development? One way to weigh its value may be to consider sustainable development studies without any ethnographic data. For example, what can I tell about whether the STRP is sustainable or not without living in the project area, interacting with the residents, and observing their life? Provided that I can gather all the data available, I may say that, 'in order to devise a survival strategy of South Korea between China and Japan we need to build the *Saemangeum* area as a strategic gateway for the Northeast Asia (Lim 1999)', 'we can calculate the economic values of the mudflats in the area (Jeon, Shin, and Ha 2002, Kang and Nam 2004)', "news media constructed perceptions and positions that a corpus of interacting individuals and groups have retained with regard to the controversial *Saemangeum* project (Kang 2002)", or 'the STRP became the first nation-wide controversy over environment versus development (Choi 2006)'.

All such researches must have contributed to the studies of both sustainable development and the STRP in their own way. However, it seems that those studies lack something essential to reveal whether real life of a community, the socio-ecological sustainability of a region, or the progress of a project like the STRP is going towards sustainable development or not. Anthropologists are well aware of the shortage of the 'something essential' in other disciplines and try to fill the lack of understanding by

producing context-relevant data in a specific time, space, and people through ethnographic methods, which in case of sustainable development primarily focus on the topics such as governance, the commons, traditional ecological knowledge (TEK), the practices of sustainable development like education, and eco-tourism.[31]

Several anthropologists reveal what it means to the Korean the compressed 'development' and rapid modernization during the last decades based on the ethnographic analyses of gender and traditional beliefs ((Kendall 1996, Kendall 2003), social movements (Abelmann and NetLibrary 1996), and upward social mobility (Abelmann 1997, Abelmann 2003). There are a number of studies on a specific issue of sustainable development such as 'the commons' in other regions in South Korea (for instance, Kang 2010, Kim 2006, Yun 2002).

In addition, there are ethnographic works about the STRP. J.-M. Park (2002) conducted in-depth interviews within the STRP area (Gunsan-si, Kimje-si, and *Buan* district) revealing that not only the STRP brought about the negative impact on the livelihood of the fishermen, but it also ignited several internal conflicts within the local villagers – between farmers (who were mainly supportive of or at least indifferent to the STRP) and the fishermen (who mostly opposed to the STRP), between the immigrants and the indigenous people, between the villagers whose territory was directly adjacent to the mudflats and others (who were also barehand clam gatherers but their villages were not directly adjacent to the mudflats and therefore had to seek sharing the mudflats), and among the villagers over the compensations executed by the government. J. S. Jeon (2004) tries to apply the methods of visual anthropology to reveal the STRP discourses among the *Gyehwa*-do area (*Gyehwa*-Island)

[31] The contributions and theoretical issues in the anthropological works regarding sustainable development will be dealt with in detail later in the Section 3.

local people. The product from the result of his research is a text for the anthropological film that he titled as ‘Let Them Speak’. K. Park (2003) uses eco-feminist approach to describe women in *Gyehwa*-do (*Gyehwa*-Island). Women whose subsistence depended on the mudflats had their life experiences embedded in their environment; thus, their identity was a meaningful embodiment of such experiences. The STRP rendered them a victim of economic development but it also led to awakening them to becoming defenders of their means of living as well as ‘protectors of life’ (all the life forms in the mudflats). It seems to be H. H. Hahm who conducted the most extensive ethnographic work in the STRP area (Hahm 2002, 2004, 2004, 2010). Focusing on the women’s life and experience by the STRP, she describes the matter of identity, the change of fishermen’s consciousness by the ecological crisis, the confusion between ecological ethics and the right to live, and the individual/community-level suffering by the STRP such as the anxiety of survival, social conflicts from the contested compensation processes, the sacrifice of women by the paternalistic familism, and the fission of the community by nationalism or regionalism for economic development. Nevertheless, she also shows that women become more aware of independence through their own labor in the mudflats as a main subsistence source and by participating actively in protests against the STRP, which can be regarded as good example of women empowerment but also reveals the limits of their collective power for preserving the tideland (ultimately they lost the mudflats completely in 2006 by the completion of the dykes).

However, there is no study of the STRP based on ethnographic methods, specifically from the perspective of sustainable development. Considering the spread of sustainable development discourses (more broadly, the environmentalist discourses) across the country since the early 1990s and the nation-wide controversy over the STRP, this should be an

alarming lack of study. This study will be one of the first attempts to fill the gap by combining the ethnographic methods and sustainable development discussions in the context of the STRP.

2.2 The Journeys to the Fieldwork Sites

My fieldwork took place in the districts in North *Jeolla* province (*Jeolla*buk-do) shown in Figure 8. It extends over a ten month period in *Gyehwa*-township, *Buan* district from July to October, 2010 and in *Simwon*-township, *Gochang* district from November, 2010 to April, 2011.

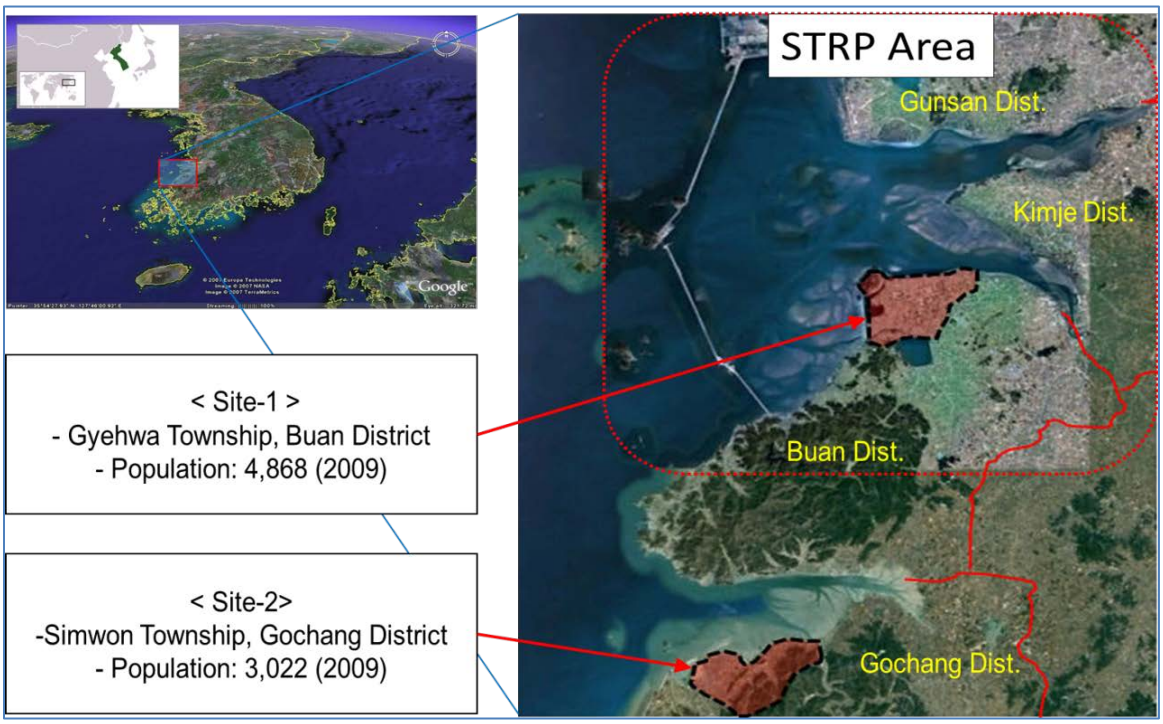

Figure 8. Two fieldwork sites. (Maps were captured from Google Earth™)
Notes: The population statistics come from each district office.

The first site - *Gyehwa*-township - has every reason to be chosen as the site for fieldwork. It is located in the center of the STRP. It is also *Gyehwa*-township that has lost all the mudflats completely among many townships in the *Saemangeum* area. I visited the township for the first time in summer, 2005 during the trip for looking around most of the mudflats along the western and southern coastline of South Korea. In winter, 2005 - 2006, I conducted interviews for my thesis, during which I met one informant - SangSeop Kim[32] - who was a custodian of a cultural heritage site. Owing to his hospitality, I was able to lodge at the management building of the cultural heritage site over the course of the next several years when I visited the township each summer for durations ranging from a few days to one week.

During my stay in the township in 2006 - 2009, I developed relationships with several informants, one of whom, forty-five year old, JaeHyung Lee has become a good friend as well as one of the important sources of data for this study. However, when I prepared my fieldwork in 2010, I decided to stay at a non-acquaintance's to be more objective in my observations. I contacted the township office to find a place to stay, which led to the home of eighty-year old YoungSoo Cho (80). The Cho family seemed to be appropriate for my study because their house was modest, their standard of living looked moderate, and they had had lived there about forty years experiencing all the major socio-ecological changes in the village.

There were some occasions when I felt conflict in my mind between the academic intent to be as objective as possible and the practical relationships with local villagers. Whenever I attended a meeting of the village heads, of the village development committee,

[32] For the confidentiality and anonymity, I have used pseudonyms for all my informants

or a meeting of villagers with outsiders such as officials, contractors, or researchers, I found myself in the position of the villagers in favor of their interests.[33] I was asked my opinions sometimes about the specific issues like the concerns on the village development plan or about the operations of farms and cooperatives. I tried not to influence their decisions but still I knew I spoke for their interests. For instance, when a few researchers visited JaeHyung Lee's agricultural farming association to discuss the way to improve the quality of his crops for a special use, I urged the professors to help him for the purpose of contributing to the rural development in the region.[34]

Looking for a household to stay in the second site was easier than the first one. The person whom I met in a local village of *Simwon*-township to ask for directions happened to be a village head – KyuKwan Lim (65) - who introduced me to SungKwang Choi (77) at whose house I decided to stay. The Choi's were also appropriate for my study. He was born there and his long engagement in the clam breeding aquaculture became a great source of data. *Simwon*-township, in contrast to *Gyehwa*-township, did not have a development project or event linking with outsiders' activities. Therefore, I didn't have to feel any conflicts when I was with the villagers.

As an urbanite, I had a difficulty in adapting to their diet at the beginning of the fieldwork.[35] Mrs. Cho prepared the meals for me and Mr. Cho. With a bowl of steamed rice,

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[33] For instance, in a meeting with the members of the *Gyehwa*-do Village Development Committee, they discussed an issue of what they would ask the government as part of compensation due to the earnest beginning of the internal development of the STRP. I suggested that they needed to ask the government not a big request but several small realistic and practical requests such as the permit of fishery within the planned freshwater lake, the establishment of a construction office for the internal development in their village (to get the benefits from employment and revenue from the laborers' spending), and the construction of a road to climb up the *Gyehwa*-mountain.

[34] Fortunately, in any case, it seemed that expressing my opinions did not have any influence in their decision-making.

[35] Mrs. Cho's meals tasted too bland at first. The customary Korean meals are composed of the main dish

the side dishes were almost the same - a soup (usually Korean bean paste soup, small fish soup, or bean sprouts soup), seasoned raw crabs (small crabs about the size of half a finger joint), beans cooked in soy sauce, and several *kimchs* (radish *kimch*, cabbage *kimch*, or cucumber *kimchi*). In case of the Choi's in *Simwon*-township, I didn't have much difficulty in joining with their meals after several months experience of similar diet at the Cho's.

2.3 Methods

2.3.1 Surveys and interviews

i) Personal Ecological Footprint surveys: Global Footprint Network (GFN) is a nonprofit organization that was created by one of the two original developers of the Ecological Footprint concept, Mathis Wackernagel.[36] Global Footprint Network (GFN) functions as the focal point of the scientific research on Ecological Footprint and maintains the global database (the National Footprint Accounts) and methodology resources. Global Footprint Network (GFN) provides a test for Personal Ecological Footprint (EF).[37] Currently, the calculation of Personal Ecological Footprint of fifteen countries is available.[38] South Korea is not yet included. Fortunately, one of the available countries - Japan - can be used as a proxy. First, despite of the difference in GDP per capita, in Ecological Footprint point of view,

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(usually a bowl of steamed rice) and several side dishes. Recent diet in urban life, which I have been accustomed to, has extremely diversified side dishes. The urbanite usually purchase side dishes which are tasty with a variety of artificial condiments and flavors. I realized how much my sense of taste had been tuned to such artificial additives when I first faced the meal of the Chos.

[36] The concept of the Ecological Footprint and methodology to calculate it was developed by Mathis Wackernagel and William Rees in the 1990s. See Wackernagel and Rees (1996).

[37] http://www.footprintnetwork.org/en/index.php/GFN/page/personal_footprint/

[38] Personal Ecological Footprints for US, Canada, Columbia, Ecuador, Peru, Argentina, Brazil, South Africa, Switzerland, Italy, Turkey, India, China, Australia, and Japan are provided in GFN.

Japan and Korea are very similar. Shown in the Table 6, not only the Ecological Footprint per capita but also most aspects of Personal Ecological Footprint (land area types demanded by consumption) are alike. Second, the questions provided by the Personal Ecological Footprint calculator for Japan are applicable to Korea when interpreted into Korean language and currency. In addition, all the questions are applicable to Korea appropriately in terms of culture as well as living patterns of food, goods, shelter and mobility.[39] Third, using a provided Personal Ecological Footprint measure but not a created one is reasonable for the objective of this study, which needs a consistent and reliable sustainable development indicator (SDI) but does not require an accurate measure in absolute values.[40]

Table 6. Comparison Ecological Footprint per capita between Japan and South Korea. [from GEF (2010a)].

		EF (global hectares per capita)						
	Income Group	EF of Consumption	Cropland	Grazing	Forest	Fishing Ground	Carbon	Built-up Land
Japan	HI	4.729	0.566	0.066	0.275	0.624	3.135	0.063
S. Korea	HI	4.869	0.751	0.082	0.258	0.538	3.173	0.068

[39] The questions in the Personal Ecological Footprint survey are attached in the Appendix A.

[40] For example, Han, Lee, and Oh (2011a, 2011b) calculate EF per capita in Gyeonggi Province (Gyeonggi-Do). However, developing survey questions for Personal Ecological Footprint based on the calculated EF is another matter. Development of an accurate EF for a region does not necessarily guarantee its applicability to the Personal Ecological Footprint survey. Therefore, for the consistency and the comparability between *Gyehwa*-township and *Simwon*-township, Personal Ecological Footprint questions for Japan provided by GEF can be reasonably acceptable without conducting separate research project to develop another Personal Ecological Footprint measure.

The first criterion for selecting survey participants is whether or not he or she is registered in the official township record as a resident. Quota sampling would be better to assess the impact of migration but statistical data is not available. Therefore, instead of strict quota based sampling, this study uses purposive sampling[41] to find comparable number of participants according to migration, age and gender. Table 7 shows a breakdown of the surveys by gender, age, and migration status. Altogether, 113 residents of *Gyehwa*-township and 117 of *Simwon*-township participated in the survey.

Before conducting the surveys, I tested the questions (in Korean, translated by me) with several informants who had everyday interactions with local people but who themselves were not the residents of the townships. Next, I tried to distribute the surveys as evenly as possible in terms of locations - visiting community halls, village pavilions, township offices, churches, laundries, shops as well as ordinary households.

ii) Semi-structured interviews: The survey respondents were also asked to participate in a semi-structured interview, which included questions about their life history, their consumption habits (similar to questions asked in the Personal Ecological Footprint survey), their views of the STRP, and their overall quality of life. Not all survey respondents participated in the interviews. In addition, several people participated in an interview but did not complete the survey. For example, several commuters who spend most of their time in interacting with local residents were also interviewed (see Table 8). The interviews mainly took place in their houses, senior citizen community centers, and township offices. The interviews usually took about 30 minutes to one hour.

[41] Bernard (2006).

Table 7. Samples for surveys in *Gyehwa*-township and *Simwon*-township

Township	*Gyehwa*		*Simwon*	
# of survey	113		117	
Migration[42]	Original Residents and Their Descendants	Immigrants after the beginning of GTRP and Their Descendants	N/A	
	44	69		
Age[43]	Younger Generation (~ 60)	Older Generation (61 or over)	Younger Generation (~ 60)	Older Generation (61 or over)
	42	71	52	65
Gender	Female	Male	Female	Male
	54	59	49	68

The questions for the interviews have two categories (sustainable development

[42] Among the original residents (44), younger generation is 12 and older generation is 32. As to the immigrants, younger generation is 31 and older generation is 38.

[43] In this study, the distinction between younger generation and older generation is 60. There are several reasons for this. First, South Korea is a super-aged country, which is revealed especially in the rural area. In *Gyehwa*-township, according to the district statistics, the population in 2009 is distributed by age group: 20s – 16%, 30s – 15%, 40s – 19%, 50s – 19%, and 60s or over – 31% (excluding the age group 0 ~ 19) and in *Simwon*-township (Gochang District Office 2010a), the population in 2009 is distributed by age group: 20s – 13%, 30s – 10%, 40s – 16%, 50s – 18%, and 60s or over – 43% (excluding the age group 0 ~ 19). However, the majority of the twenties are only nominally registered in the government residence statistics. Most of them stay in different regions for their undergraduate/graduate education, military service (only for the male), and job-seeking activities. Therefore, it is reasonable to assume that, the time when they get married is the time of matching between the nominal residence and the actual residence. Considering that, in South Korea, the age at first marriage is 32 for male and 29 for female (National Statistical Office 2011b), it is not surprising to encounter few villagers in their twenties. Among the survey respondents in *Gyehwa*-township, each age group proportion is as follows: 20s – 3%, 30s – 4%, 40s – 9%, 50s – 21%, and 60s or over – 63% (excluding the age group 0 ~ 19). As for *Simwon*-township, each age group proportion is: 20s – 3%, 30s – 7%, 40s – 13%, 50s – 21%, and 60s or over – 56% (excluding the age group 0 ~ 19). Second, the age 60 is the villagers' own criterion by which they divide their communal institutions – Senior Group (*No-In-Hoe*, over 60) and Youth Adult Group (*Cheong-Neon-Hoe*, 20 ~ 60), which will be discussed in Section 5.3.2. In sum, in this study, the younger generation (or Youth Adult Group) means those who are under 60 and the older generation (or Senior Group) means those who are 61 or over.

indicators and quality of life indicators) and several subcategories to each main category (for example, wealth, environmental conditions, material well-being, or non-material well-being) based on Stiglitz, Sen, and Fitoussi's (2009) discussion on the economic and social progress indicators.[44] However, after conducting a few interviews, it became apparent that I couldn't strictly stick to all the items in the categories. I decided that, instead of following the exact questions according to each item in the subcategories, I aimed at improvising subcategory questions to make the interactions during the interview as convenient as possible for the participants.

Table 8. Sample for interviews in *Gyehwa*-township and *Simwon*-township[45]

Township	*Gyehwa*	*Simwon*
# of Interview	86 +	76 +

2.3.2 Participant observation

Participant observation was the primary method used to collect and analyze data during fieldwork in the two townships. While the continuum of participation ranges from nonparticipation to complete participation, my level of participation in the daily activities of the Gyewha township was moderate, a balance between participation and observation, or

[44] The categories and subcategories of the questions for the semi-structured interviews are in the Appendix B.

[45] Among 113 survey respondents in *Gyehwa*-township, 80 participated in the interview and the remaining six + participated without survey. In *Simwon*-township, out of 117 survey respondents, 74 participated in the interview and additional two + participated without survey.

outsider and insider (DeWalt and DeWalt 2002). I stayed at a resident family's home in each township, sometimes helping with their works such as farming or collecting shells and often attending meetings of village members. Data gathered from participant observation is mainly used for assessing quality of life of the residents.

In a typical day of the fieldwork, I tried to adapt to the local villagers' life cycle. I woke up around five a.m. while hearing the sound of the Chos and Chois rising at dawn. Around 6:30, I had breakfast with them. In the morning, I visited various places to conduct the survey and interviews. Usually, three or four surveys and interviews were done per day. The hours in the afternoon were spent watching and observing the usual activities of the villagers. Sometimes, I participated in working with the informants - cutting, cleaning and pruning crops, operating tools, or carrying products to the storehouses. However, in *Simwon*-township, owing the seasonal characteristics (winter - the leisure season for the villagers), I usually stayed indoors, listening to their life history or just hearing their everyday chats. Sometimes, besides the communal meetings such as the village head meetings, I participated in unofficial gatherings like preparing for opening business or birthday party, and traditional gathering such as the ceremony for a good catch. In the villages of *Gyehwa* and *Simwon*-township, after dinner around 7 - 8 p.m., almost all the streets and road become dark and empty and the families typically go to bed before 9 p.m., which seems the most striking difference compared to the life of the urbanites.

The Chos and the Chois whose home I stayed at, both lived as a nuclear family. All their children had left to live individually of their own household except the youngest son of the Chois, who stayed near his parents' home. The Cho's home had three rooms and the Choi's had four rooms but except one or two for the use as a bedroom, the remaining rooms

were empty, where I could stay. Most of the villagers in the two townships lived at home in which only the wife and husband couple and often only single person (widow or widower) occupied. Some of the villagers were kin to each other such as parents-child relationship but it was rare for siblings to stay together in the same village with their parents. Even in the case where grownup children remained with their parents in the same township, except that child, the other his or her siblings stayed in other regions. Apparently, it seems a result of the rural-urban migration through rapid urbanization for the last several decades in South Korea. Although most of villagers knew each other not only next door but also almost all the village members, it was rare that they were relatives to each other. Most of the Chos relatives lived in remote cities like Jeonju-city and Kimje-city and the Choi's were in Seoul and other big cities.

3. SUSTAINABLE DEVELOPMENT - A JUNGLE OF RESEARCH FOR A PANACEA

3.1 Introduction

Sustainable development is everywhere.[46] If sustainable development is an agent, it is an all-round player in the world of contemporary ideas. Sustainable development can deal with climate change, green growth, global environmental justice, biodiversity, and many other problems and matters local and global. If sustainable development is a structure, it is the Matrix - "The Matrix has us". From sustainable development to sustainable production, sustainable consumption, to sustainable agriculture, sustainable finance, to sustainable food, sustainable housing, sustainable transportation, to sustainable education, sustainable community, sustainable Seattle, sustainable Jersey, sustainable hospitals, sustainable dance club[47] …, it goes on and on. It is no wonder that sustainable development studies and practices compose a thick jungle in which the researchers and practitioners are organized as if they are layers from the forest floor to the canopy or the emergents. It is also no wonder that sustainable development students need a variety of skills to survive in this jungle and they "might be overwhelmed by the call to acquire all of these competencies" (Wiek, Withycombe, and Redman 2011:214).

Not surprisingly, this study will cover only a brief cross section of the jungle in the

[46] Ubiquitousness of sustainable development reflects the ascendance of sustainable development as an overarching idea. Since Murcott (1997) compiled 57 definitions, it seems that no more effort has been made to collect or list definitions of sustainable development. The degree of sustainable development spread seems to reach deep and unconscious level enough to devise ad-hoc definitions when necessary. More recently, as Mann (2009) shows while piling up 282 diagrammatic definitions of sustainable development, the diversity of sustainable development expressions goes beyond an individual's or a group's capacity.

[47] Originally launched in a dance club in the Netherlands (Rotterdam Club Off Corso) in 2006, their mission is announced, "(t)o create personal experiences where sustainability and fun are combined. To inspire (young) people worldwide to adopt a more sustainable lifestyle" (Sustainable Dance Club (SDC) 2011).

spatial context of two small townships in the southwestern corner of South Korea and in the temporal context of at best 40 years. However, before proceeding further, it is necessary to survey the area of this study by locating it within its surrounding landscapes in the vast map of sustainable development world. This section is composed of four main sections. First, by sketching the mainstream discourses on sustainable development, I will draw a picture of the currently dominating agendas of sustainable development, which is not so different as the scenery of two townships as a miniature of itself. Second, various issues (such as displacement, rebound effect, and the meanings of sustainable development to the individual) behind the stage of mainstream sustainable development discussions will be highlighted. Of course, the choices of themes cannot but be limited to the most conspicuous ones. However, they are not arbitrarily selected for the application to the research questions. Third, anthropological studies on sustainable development will be reviewed in order to obtain insights of use in the two townships. A summary section will follow to assemble sustainable development tools which will be used to analyze the ethnographic data of this study.

3.2 The Canopy of the Jungle: Development and Sustainable Development

3.2.1 The aging of development of theory and practice and the birth of sustainable development.

No matter what humans, at least collectively at the local community or the nation-state level, try to attain in the course of their actions, be it happiness, wellbeing, or prosperity, they always tend to seek more of that thing. Development does not in and of itself happiness, wellbeing, or prosperity but it has often been regarded as the only process through which we

can reach a higher level of these things. A simple but powerful measure of whether we achieve development in a year in comparison with the previous year is economic growth calculated by GDP. Amazing simplification of the logic of thinking makes us believe, now almost unconsciously, that the percentage number of GDP growth rate is the incarnation of development and therefore of happiness, wellbeing, or prosperity.[48]

Of course there were always side effects, there were always derivative problems, and there were always nagging dissents; but they could be prescribed, solved, and stifled in order to protect the sacred temple of GDP growth. These problems - environment, population, famine, women's status, habitat destruction or unemployment - have been discovered or rather diagnosed one by one with the spread of 'growth' or 'development' all over the world in the 1950s - 1970s.[49] It seems that the list of diagnosed problems never stops. After the debt crisis in the Third World in the 1980s - 1990s, global warming or climate change arrived as the main issue of the 21st century. It always seems that there are diagnoses and

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[48] Of course, a number of efforts have been made to propose the alternative measures of GDP (and GDP per capita) for the standard of living or the quality of life. Since Sen (1984) proposed 'capability' as one type of freedom for the standard of living, many subjective, objective and composite of both indicators have been suggested. Recent trends on quality of life studies well transcend the GDP-based approaches, integrating a variety of aspects of human life into comprehensive frameworks (for instance, Jackson (2009), Costanza et al. (2007), Stiglitz, Sen, and Fitoussi (2009) just to name a few). Also as one of many such efforts as to overcome the GDP based approaches in South Korea, Jeong et al. (2010) describes the social quality by using about 90 experiential indices based on a comprehensive integration of socio-economic security, social cohesion, social inclusion, and social empowerment. However, despite these 'conscious' efforts, the unconscious attention of absolute majority seems still to be paid only to GDP. Although human life based on Personal Ecological Footprint must have improved (following the definition of sustainable development in this study) during the global financial crisis since 2008, little attention is paid to that 'improvement' while most of people feared by the plunge of GDP.

[49] Considering all the positive implications of the word 'development' - from development of infant to development of space technology - it is unintelligible to place development and all the problems in parallel as if they were opposite sides of the same coin. This can be explained by the imprudent fusion of the two very different meanings of development into one term. According to Shiva (2008:13-14), for the positive meaning, the term development refers to '*autopoetic*' systems which can perform self-directed, self-regulated, and self-organized evolution from within. On the other hand, the meaning of development currently used in economics refers to the opposite '*allopoetic*' systems, which can run only from external sources. For tracing historically such problems as environment, population, poverty, women, needs, or standard of living in parallel with the idea of development, refer to Sachs (2010). As to sustainable development with the similar relations with such problems, refer to Escobar (1995).

prescriptions but no cure or recovery. The sacred beings of 'growth' or 'development' must suffer from much more than just temporary illnesses or injuries. It seems that growth or development is in the natural course of its own life cycle: Growth is facing ***aging*** and development is experiencing ***aging***.

Fortunately, however, the discovery of an antidote to aging of development has been announced. Although the search for it had a long history[50], the concept of sustainable development officially debuted in the Report of the UN World Commission on Environment and Development, *Our Common Future* (often referred to as the Brundtland Commission)(1987): 'sustainable development'. Although sustainable development is said to be merely as a slogan (Giddens 2009) and an oxymoron at that (Redclift 2005), it has real and corporeal power through powerful global institutions such as UN, the Organization for Economic Co-operation and Development (OECD), World Bank, through many international research organizations like the European Sustainable Development Network (ESDN), the World Business Council for Sustainable Development (WBCSD), the International Institute for Sustainable Development (IISD), and through many state level and local level governmental and non-governmental institutions across the world.

Accordingly, an academic boom has taken place in the emergence of sustainable development and sustainable development-centered journals.[51] If there could be only one

[50] According to Scoones (2007:590), the term 'sustainability' was coined in 1712 by a German forester. It was, however, not until the 1980s that the term attracted wider concern. As to the brief history of sustainable development since the 1970s, refer to Choi (2006).

[51] The quantitative analyses and an analysis of citation network of sustainable development conducted by Kajikawa et al. (2007), Kajikawa (2008), and Yarime, Takeda, and Kajikawa (2010) show that, the number of articles on sustainable development, reaching 3,000 annually in 2007, is still increasing linearly and the accumulated number of publications is increasing exponentially. In addition, these publications appear across extremely diverse range of fields in the natural and social sciences, engineering, and medicine, which means even the most popular journals on sustainable development may capture no more than 5% of all of the important papers published (2007).

concept that could summon all the presidents, prime ministers, or other top leaders of states to literally one place, like the Rio Summit in 1992, the Johannesburg Summit in 2002 and the coming Rio+20 Summit in 2012, that should be no other than that of sustainable development.

3.2.2 The revitalization of growth: mainstream discourses on sustainable development

In preparing the 20th anniversary celebration of the Rio Summit, the main global players on sustainable development put forward a new (conceptually old but refreshed as a new brand) catch-phrase - 'green economy' (United Nations Conference on Trade and Development (UNCTAD) 2011, United Nations Environment Programme (UNEP) 2011, World Business Council for Sustainable Development (WBCSD) 2010) or 'green growth' (OECD 2011). Economic crisis since 2008 boosted the concept of green economy as a cornerstone for a Global Green New Deal (GGND), which was swiftly adopted as a primary initiative for reinvigorating economic growth by states [e.g. US (Obama 2008), South Korea and China (Barbier 2010)]. Though many critics have savaged the idea of growth for decades, the global fear of another version of the Great Depression seems to have successfully won people's heart for the aspiration toward economic growth once more.

Green economy is identified in the context of sustainable development (Le Blanc 2011:151) and green growth is "conceived as not a replacement for sustainable development, but rather should be considered a subset of it" (OECD 2011:11). Considering that the promoters of green economy or green growth are the mainstream players in the spread of the sustainable development concept over the past 30 years, it would not deviate from the reality of the current status of mainstream sustainable development discourses to sketch the outline

of the scope of green economy or green growth.

First, in reframing sustainable development as green growth, there are certain forms of thinking that are not questioned. For example, in the obligatory ideas of sustainable development, there are three pillars which prop up the whole architecture: the environment, society and economy. From the local to the global level, "we assume a collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development" [The World Summit on Sustainable Development (WSSD) (2002)].[52] That the social pillar is the weakest of the three is generally recognized and the necessity of attending to it is broadly accepted.[53] Another conspicuous feature of the standard sustainable development discussion is that, sustainable development is a comprehensive description of the *processes* and *procedures* to *fix* the byproduct *problems* of human beings in the course of *development* under the banner of industrialization or modernization. Moreover, the problems are diagnosed by the language of science and technology. The processes and procedures are prescribed by the managerial language of policy, control, or regulation; the relative success of these is to be assessed and measured by the language of accounting. For example, a necessary diagnosis of the current status of the ecosystems, the Millennium Ecosystem Assessment (MEA) report, is a synthesis of "information from the scientific literature and relevant peer-reviewed datasets and models"

[52] The concept of the 'three pillars' is also expanded to, for example, the concept of the Triple Bottom Line (TBL), also known as "people, planet, profit" representing a comprehensive set of criteria for evaluating the development of organizations and societies economically, ecologically and socially (United Nations Environment Programme (UNEP) 2011:361).

[53] Although ethnographic works on sustainable development primarily concern social or cultural dimension, they are only small fraction of the whole body of sustainable development publications. Among the three pillars of sustainable development, "(a)s of today, concerns with environmental and economic sustainability have eclipsed efforts to understand the social aspects of sustainability" (Dillard, Dujon, and King 2009:2). As a practical tool or framework towards sustainability, social dimension also shows the lack of robustness compared to the ecological dimension (Missimer et al. 2010).

made by approximately 1,360 professional scientific experts (Hassan, Scholes, and Ash 2005). Based on such diagnoses, tools for delivering on sustainable development or its subset green growth will be prescribed to include economic policies like taxes, tariffs, and subsidies for a state or modeling tools for future scenarios, international governance, and financial plans globally (United Nations Environment Programme (UNEP) 2011). In brief, the orthodox sustainable development is a world dominated mainly by hard sciences and engineering, management or governance, and economics. What is obscured in this orderly scenery is the struggling world of the collectivity of the artificial and the natural hidden under the cloak of science and technology, the practical world of inter-governmentality between structure and agency shadowed by the government and institutions, and the everyday world of the social within which embeds the economy as an integrated part.

Second, as for the social pillar of sustainable development, it seems that much attention is paid to the long-time losers - women, the poor, the least developed countries (LDCs), the South, or the indigenous peoples.[54] However, in this empathically well-meant world of sustainable development full of losers, strangely enough, there is no winner. There is no conqueror, no self-help entrepreneur, no inflictor, or no criminal who should be responsible for the worldwide crises today which call for the urgent priority for taking sustainable development related actions in an unprecedented level. For instance, in the mainstream diagnoses of sustainable development related issues, it is rarely mentioned that the single greatest producer of carbon dioxide emissions is the U.S. military, an organization

[54] Green economy itself is proclaimed in the context of sustainable development and poverty eradication (Le Blanc 2011). OECD (2008) published a study - *Gender and Sustainable Development* - and sponsored a study addressing the indigenous people and sustainable development - *Indigenous Peoples, Poverty and Development* (Hall and Patrinos 2010).

that doesn't provide any man-made or ecological service whatsoever.[55] Political ecology shows how the ecological world is heavily and unavoidably interweaved with the power relations of political economy.[56] Then, sustainable development, if it has only a façade of assuaging the losers and it cannot but fail to take real actions for them, seems simply to go around back to the world of ecology without politics or political economy - a pristine but criminalized world without criminals.

Third, as in most areas of the contemporary academia, work on sustainable development is produced by teams, groups of teams, or consortia or leagues of research teams. *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication* by UNEP (2011), for example, is the result of the cooperation by hundreds of researchers who contributed to the book. Many works cited in the book, which are part of more than two thousands references, are themselves a result of another cooperation by other hundreds of researchers. This is a very subtle phenomenon. The matter is neither the gigantic manner of organizing nor the all-encompassing nature of the content. The way they conduct researches with sustainable development - the harmonious cooperation to produce a formal, well-ordered, and overwhelmingly thick report - is the very way to conceptualize sustainable development as an understandable 'thing' to the researchers themselves. Now, the managers, supervisors, or chairpersons of the teams or of the groups of subgroups are satisfied with the beautifully lined, drawn, and colored art-works ordered from agriculture, fisheries, water, and forests to renewable energy, manufacturing, waste, buildings, transport, tourism, and cities,

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[55] According to Karbuz (2007), in 2006, US military consumed 1100 trillion Btu, which was comparable to the consumption of Nigeria, with a population of more than 140 million. "The truth is that the U.S. military is the single largest consumer of energy in the world" (Kaburz 2007).

[56] According to Greenberg and Park (1994b), political ecology is a synthesis of "political economy, with its insistence on the need to link the distribution of power with productive activity and ecological analysis, with its broader vision of bio-environmental relationships".

and finally to models/scenarios, enabling conditions, and financing.[57]

By pointing out this, I do not mean that the scientific achievements for sustainable development such as MEA or IPCC reports should be reevaluated or discarded. On the contrary, they must be implemented. What I am pointing out here is the phenomena where, the practices for sustainable development only replicates the exact structures that have been begetting, if borrowing Bourdieu's (1977) term, the 'habitus' of unsustainable industrialized world through the way of conducting research while what the practices of sustainable development really mean to bring about - the real change of the world, the new way of interactions between the change and a new habitus of sustainable world - remains mere dream. For example, regarding one of the inveterate problems even in sustainable development studies - the inequality between the North and the South – Brown, Harris, and Russell (2010) point to the similar dilemma that "the role of existing research and higher education institutions in wealthy countries in perpetuating this inequality maybe uncomfortable for academics to consider, especially if one takes seriously the idea that science and research form a significant component of the larger machineries of global inequality and disadvantage".

Fourth, in spite of so many criticisms against using GDP (and GDP per capita) as an indicator for social welfare or economic progress (van den Bergh 2009, 2010) and in addition, while almost all works on sustainable development are very keen to point out that GDP "provide a distorted lens for economic performance" (United Nations Environment Programme (UNEP) 2011:23), that 'almost all' works on sustainable development are, at the same time, promptly keen to use it as a sacrosanct indicator for assessing or measuring from

[57] As a virtue of operationalism, Geertz (1973:5) points out that, "if you want to understand what a science is, you should look in the first instance not at its theories or its findings, and certainly not at what its apologists say about it; you should look at what the practitioners of it do"

the current status of the problems to the needed investment to solve the problems and to the extent to which the solutions achieve. This does not seem to be a matter of will and resoluteness to use alternative indicators. *The Growth Report*, published in the middle of global financial crisis by the World Bank (2008), show clearly the symptom of aging – an eagerness for rejuvenation.[58] Even if endorsed for a detailed analysis within the same document, alternative indicators never appear in the concluding implementation or action plan section of a mainstream sustainable development works. It is really easy and simple to distinguish whether a work on sustainable development belongs to the mainstream sustainable development or not by looking at the 'how to implement action plans for the sustainable future' section to see if the measurements are guided by GDP or GDP per capita.

The features of mainstream sustainable development discourses discussed above - sustainable development as a monopolized world by engineering, management, governance, and economics, sustainable development as a well-trimmed ecological landscape, sustainable development as a bureaucratic report-producing process, or sustainable development as an effort to rejuvenate GDP growth - are reiterated at the level of state. For example, in *The right way to know about green growth*, a comprehensive work on green growth for the public by the Presidential Committee on Green Growth (2011) of South Korea, the professionals commissioned by the Presidential Committee compose a Korean version of green growth revealing the four conspicuous features of mainstream sustainable development discourses, especially emphasizing the induced additional 3.5 ~ 4 % increase of GDP in terms of production by investing 2 % of annual GDP in green growth. What is interesting is not the fact that the four features of mainstream sustainable development discourses dominate at the

[58] In this report produced by eighteen contributors including two Nobelists in economics and a former prime minister in South Korea, 'growth' is defined as GDP growing at an average annual rate of 7 percent or more for 25 years or more. Only 13 countries since 1950 experienced this particular phenomenon.

top of hierarchical eco-system of sustainable development researches, but a seemingly inescapable phenomenon that even critical researchers about the mainstream sustainable development discussions, once involved in a collaborative work, become a cog of the whole machine. Fierce criticisms seem essential to sustain the mainstream sustainable development discourses!

In South Korea, the STRP is in the center of such contradictory scene. As the title of the project tells, '*Saemangeum*' ('New Millions of Rice Harvest' translated to English) was originally meant to transform the area into a golden rice paddy. In the course of twenty years development, it metamorphosed to be a 'Luxurious Multi-functional City' (Korean Rural Community & Agriculture Corporation Saemangeum Project Office (KRC Saemangeum Project Office) 2010). Reflecting the current trend towards "green growth", the project is now portrayed as a mecca of renewable energy integrated with industrial complex and agriculture of leading edge high technologies (see Figure 9).

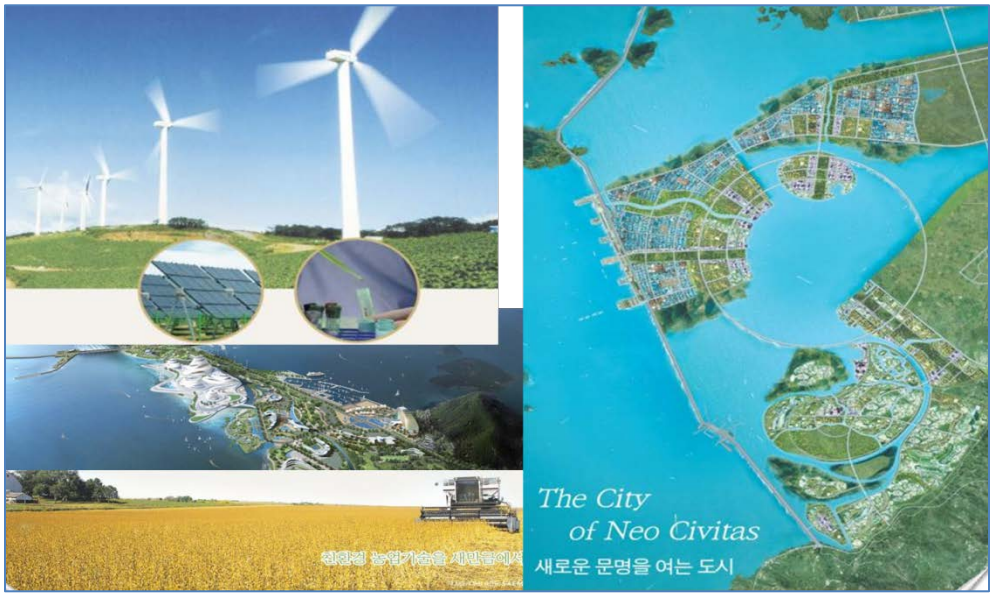

Figure 9. Bird's-eye views of the planned STRP area. [from KRC *Saemangeum* Project Office (2010)]

However, when those speckless, political-economy-free ecological, and orderly features of mainstream sustainable development discourses are encountered by local residents, what happens? What do the ideas mean to local people who are living near a major project that is alleged to be an example of sustainable development? Most of them are well aware of the fact that they will not be able to put their hands on even a small scrap of the reclaimed land.[59] Of course, a number of local residents fought against the STRP which they believed would bring about the benefits only for outside corporations without proper compensations for them.[60] But others, the majority of people in *Buan* district, in North *Jeolla* Province, have been supportive of the STRP.[61] At least, they have not opposed to it. One way to understand this odd phenomenon in which people support a project while acknowledging the fact that they will not get any benefit from it, is to regard the project as a 'spectacle'. A French Marxist activist, Guy Debord (2006), proclaims that "(t)he spectacle is not a collection of images; it is a social relation between people that is mediated by images".

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[59] This applied not only to expected newly reclaimed land but also to the current land of *Gyehwa*-township. When I asked a local realtor, YongWoon Kim, about benefit for local residents due to the planned internal development of the STRP through the rise of land value, he laughed, "who do you think owns the houses and land? Many of them are already owned by the rich people in Seoul. Since the STRP began in the 1990s, they came and bought. They knew it would be big profit." Then he got a telephone call from an absent landlady living in *Kyunggi* Province, the National Capital region, who ordered him to deal with property tax which was levied on local resident from whom she borrowed the nominal name.

[60] This period of fierce protests by local people jointly with national environmentalist groups is called 'The Front of the Development versus Conservation' by Choi (2006). Refer to it for a detailed description of the demonstrations.

[61] Opinion polls reveal this well. For instance, in 2007, before the presidential election, 47% people in North *Jeolla* Province said they would support whomever stood by the '*Saemangeum* Special Law', which was enacted in December 2007 for facilitating the STRP (Y. 강. Kang 2007). In fact, the STRP - at least for the last 20 years - is regarded as an overwhelming victory for the 'growth coalition'. S. Lee (2008) judges, "(in) the process of growth politics in *Jeonbuk* province during last 20 years, growth coalition can hold an overwhelming position that based on a sharp gap of mobilizing power between growth and anti-growth coalition". However, unlike the general supportive atmosphere in the province or district, the villagers in the *Gyehwa*-township showed a mixed response to the question about the STRP. Most of them said that they hoped that the STRP would be done soon but such hope seemed to be far from the enthusiasm. Originally, the objective of the opposition to the STRP was to stop the construction of the dykes, which resulted in the nation-wide debates over the STRP in the late 1990s and in the early 2000s. However, once the dykes completed, as most of the opponents (including many environmental activist groups) moved their interest to different issues, the villagers seem to become indifferent to the STRP.

The presentation of a spectacle - the STRP - by the imaginary-world-makers interacts with the fierce reactions by some indigenous people and the indifferent support by the majority of others. I argue that this type of interactions centering on the 'images of spectacles' is the hallmark of the era of development at least in South Korea. However, in the era of aging of development - the era of sustainable development - things changed. Not that the spectacles are no more effective - they are still as effective as before, but that the development (or growth) coalition divulges the depletion of driving force within itself. There are no more resources - be it natural, financial, human, or ideological - enough to continue even the currently constructing projects.[62] Borrowing Vandana Shiva's terms, South Korea transformed itself from an, at least partially, autopoetic development country to a completely allopoetic development country.[63] This type of transition can be a signature of 'aging of development' and the STRP can be called the flag of aging on which the signature is written.

3.2.3 Going down to the lower story of sustainable development jungle.

Different from the well-combed orderly world of mainstream sustainable development,

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[62] Of course, the global depression since 2008 can be blamed for such stoppages of development projects. Representatively, the *Yongsan* International Business Center project (including a landmark building of 136-story skyscraper) in Seoul (City of Seoul 2011) and Songdo International Business District in Incheon city (boasting a system of pocket parks (based on the design of Savannah, Georgia), canals (like Venice), and a large Central Park (like New York) are lagging behind the schedule due to the financial crisis (Gale International Songdo Office 2011). However, more symptomatic examples of the 'aging of development' can be found in three tideland reclamation projects that began in the early 1990s - the STRP, the *Hwaseong* Tideland Reclamation Project, and the *Tando* Reclamation Project. The STRP is in the first step of the second stage of the whole project - internal development but no one knows when it can finish even reclaiming the land. Song et al. (2009) show well that the other two reclamation projects are also floating between reclaiming and conserving sea water tidal area. This kind of stoppage could have been impossible if it would have happened in the 1980s, even if serious ecological disaster would have followed. That is what happened in the 1980s and the early 1990s in the *Sihwa* Tideland Reclamation Project (Choi 2006:123-124)

[63] Maybe South Korea's economic growth must be said 'allopoetic' from the beginning in the 1960s as almost all resources except human labor had to be inflow not from within. 'Aging of development' in South Korea can be expressed as the time when even the allopoetic inflow for development becomes stagnant or decreasing.

down below is the mundane but agitating world crowded full of real sustainable development actors. Brilliant ideas and astonishing innovations are proposed. Thousands of ways to revolutionize the status quo ideology of development are debated and tested in the literature. Some of them can be tasted through Pauli (2011), Hawken, Lovins, and Lovins (1999), Steffen (2006), or Schor (2010). Although it is tempting to declare that sustainable development is the matter of adopting innovations suggested by them, this study will not cover such fascinating prospects. In the floor of sustainable development world, there are myriads of uncomfortable but inescapable questions on sustainable development. Only several of them will be dealt with in the next section - the questions particularly related with the STRP.

3.3 The Understory and Floor: the Theoretical Issues of Sustainable Development

3.3.1 Displacement - the core ethical aspects of sustainable development.

To grow economically, we need three types of entities - resources, lands, and sinks.[64] Environmental issues arise centering around these three - who acquires which resource from where, when and from whom? Who needs whose lands? Who uses whose sinks? Sustainable development is not an exception - how can we make sustainable the combinations of resources, lands, sinks and who, which, where, when, whom, whose? Through history, especially in the course of industrialization for the last several centuries, the wealthy and

[64] Ecological economics uses ‘source’ and ‘sink’ as two parts of the environment in terms of functions. While a **source** is the part of the environment that supplies usable raw materials that constitute the economic throughput and that ultimately returns as waste to the environmental sinks, a **sink** is the part of the environment that receives the waste flow of the throughput and may be able to regenerate the waste through biogeochemical cycles back to usable sources (Daly and Farley 2010:422).

powerful have benefited from resources, lands, and sinks and displaced costs and problems to the poor and weak. Not only that, the present generations have advantaged themselves while the future generations will have no choice but to accept their dispossessed fate in terms of resources, lands, and sinks. This phenomenon - what Dryzek (2005) calls, 'displacement' - is the core of the ethical aspects of sustainable development.[65] **Displacement** involves

> transferring, relocating, or otherwise transporting environmental challenges to those who have little choice but to suffer them. Put differently, environmental injustice arises because people tend to redirect rather than resolve environmental dilemmas, conveying their burdens onto vulnerable others through the geographies of power. Such displacement takes place across both space and time (Wapner and Matthew 2009:208).

Displacement occurs across space and time. Wright, Bryant, and Bullard (1994) vividly reveal why the South is called 'Sacrifice Zone' and why the 85-mile corridor along the Mississippi River from Baton Rouge to New Orleans is called 'Cancer Alley'. But what they did not show us is more significant regarding sustainable development. Cancer Alley is a particular name of the general phenomenon - displacement across space. Because they can dump toxic waste in the neighborhood of the dispossessed - mostly African Americans - across space, out of sight, people elsewhere can enjoy the benefits of petrochemical products without the slightest stings of conscience. Those who decided to wipe out the tideland of the STRP area will never realize that the future children who will be born in *Gyehwa*-township can never enjoy the benefits from the vast mudflats economically, culturally, and spiritually - displacement across time. Most of displacements take place without intentions and that's why

[65] This is one of the reasons why the Brundtland Commission suggested the 'intergenerational' equity as well as 'intragenerational' equity as core values of sustainable development in 1987 for its seminal report for sustainable development definition.

the advantaged can sleep without nightmare even if resources, lands, and sinks somewhere or sometime else degrade irrecoverably and the disadvantaged suffer.

There is another form of displacement - displacement of responsibility. For example, "(t)hrough emphasizing the growing emissions of China and India, developed countries can try to displace their fair share of the responsibility for addressing climate change onto those who have clearly contributed less" (Wapner and Matthew 2009:213). Fact is, 22.5 % of the emissions produced in China in 2004 were for products that were exported to consumers elsewhere (Davis and Caldeira 2010) and the net emission transfers via international trade from developing to developed countries reached 1.6 Gt CO_2 in 2008 (Peters et al. 2011).[66] Displacement of responsibility is a derivative effect of displacement across space and time. Such effect can be called '**the blinding effect of displacement'**.

3.3.2 Rebound effect - the mechanism of unsustainability of innovation.

Changing a regular 40-watt bulb to a comparable compact fluorescent lightbulb (CFL), many of them 7-watt, saves 82.5% of energy! Such campaigns as '*51 Things We Can Do: Can one person slow global warming?*' (Park et al. 2007) are full of easy, convenient, and carbon-reducing technologies and innovations. We have witnessed so often such rosy expectations of the sustainable development-friendly future based on technological efficiency and innovations for decades. However, humans exceeded the safe operating boundaries of three out of nine planetary systems during the same period of those optimistic expectations (Rockstrom et al. 2009) and as we witnessed after global economic crisis recently, only economic depression or severe regression seems to be able to delay the rate of increasing

[66] This (1.6 Gt) is about 5% of the global emissions in 2008.

consumption of natural resources, lands, and sinks like the atmosphere for CO_2 emissions. This phenomenon - the discrepancy between the expected decrease of natural resources use by the increased efficiency and the actual increase or often more than higher rate of increase than before introducing the efficiency measures - is called 'rebound effect' (Hanley et al. 2009, Herring and Roy 2007, Hertwich 2005, Holm and Englund 2009, Sorrell 2010).

Why rebound effect takes place is not so difficult to understand. Directly, or at the micro-level, the demand for one resource that becomes cheaper owing to the efficiency improvement can increase by reallocating income to this resource (substitution effect), or the increased disposable income as a result of lower price by new technology may lead to other resource-consuming purchases (income effect) (Hertwich 2005:86). Indirectly, or at the macro-level, the newly available income can be spent on other products and services that involves consuming energies and resources, or as a result of long-term changes in the economy caused by technological innovations, consumer preferences and social institutions may transform into more resource-intensive ones (economy wide effect) (Herring and Roy 2007:196, Hertwich 2005:87). Then, how much is it? UK Energy Research Centre (Sorrell 2010) collected studies on rebound effects showing from 37% to more than 100% in the cases of EU countries, Japan, or China. As for US direct effect, Herring and Roy (2007) provide the estimates between 5% and 50%.[67] Fouquet and Pearson (2006) provide an interesting study on the relationship between the rate of increase of income, that of technological efficiency, and that of consumption by using one example of 'lighting'. From 1800 to 2000, Real GDP per capita in UK increased fifteen times, and the lighting efficiency

[67] "A rebound effect of 10% means that 10% of the energy efficiency improvement initiated by the technological innovation is offset by increased consumption. Particularly a rebound effect of 0% means full achievement of energy reduction and 100% means complete failure. Also if a rebound effect is bigger than 100%, efficiency improvement measures can even increase energy usages" - based on Jin(2007).

increased 714 times while the consumption of ‘lighting’ per capita increased 6641 folds. To summarize, rebound effect means a formula, ‘the consumption increase (per capita) > the technological efficiency increase > the real income increase (per capita).

Regarding South Korea, Jin (2007) estimates the overall rebound effect of household part as 38% for short-term and 57 - 70% for long-term based on the data from 1975 to 2005. As for the industry part of South Korea, Lee, Ahn, and Na (2007) calculate 51% from 1990 to 2005. Considering the export-oriented economy of South Korea, it is no wonder that Koreans are eager to adopt technological innovations and try to invent new products or services. They may export those goods and services resulted by investing the saved capital from the innovations, no matter how much more energy or resource such invention may demand. As a result, South Korea has become one of the leading engines of the rebound effects over the world.

Rebound effect is connected to the broader concept, ‘decoupling’. By reconfiguring production processes and by redesigning goods and services, economic output becomes less dependent on material throughput, which leads the economy to continue to grow without breaching ecological limits (Jackson 2009:67). This is the concept of decoupling. There are two types of decoupling - relative and absolute. Relative decoupling means a decline in the ecological intensity per unit of economic output, which does not necessarily mean that the ecological impact decline absolutely, whereas absolute decoupling refers to the decline of resource impacts in absolute terms. In terms of rebound effect, relative decoupling is the case of 0 - 100 % rebound effect and absolute decoupling should be the case of below 0 % rebound effect. While some maintain that scientific and policy-driven innovations can overcome the rebound effect and achieve absolute decoupling (for example, von Weizsèacker

et al. (2009)), others point out that there is little evidence of even relative decoupling, let alone absolute decoupling (Jackson 2009). One thing that is agreed upon by both sides is the fact that rebound effect exists and decoupling is far from being achieved.

SungKwang Choi, an entrepreneur fisherman in *Simwon*-township contrived a mechanical device to collect short-necked clams (*Tapes philippinarum*), which pours out a steam of water from a hose by using the power of motor engine. He introduced the device in 2007. Before he used this electric device, he used to hire 40 barehand shell collectors for the work comparable to that of four workers with the device. What he needs for this innovation is Diesel fuel for the engine of the device. Now, most of the owners who have a breeding farm for the clams use such devices. They save the money for hiring labor power and instead invest it in consuming fossil fuels, which lead them to an inadvertent rebound effect and to being more dependent on non-renewable resource. This is also a type of displacement - displacement across time and maybe across space, too.

There are two components to sustainable development: sustainability and development. In other words, sustainable development is composed of 'what is to be sustained' and 'what is to be developed' (National Research Council (US). Policy Division. Board on Sustainable Development 1999, Parris and Kates 2003). Displacement gets in the way of what is to be developed by allowing power disparity to divide the invisible line of the advantaged and the disadvantaged, whereas rebound effect consumes unsustainably what is to be sustained. In the era of development, there were debates whether rebound effect existed. Now the debates settled. In the era of sustainable development, there are debates whether it is possible to overcome rebound effects and to achieve absolute decoupling. That is another typical symptom of the aging of development.

3.3.3 The commons - the prerequisite of sustainable development.

Most of sustainable development researchers earn money for their living from the aggregation of, contribution to the society by applying, and renovation of, data and knowledge of sustainable development. Data and knowledge of sustainable development is 'the commons' to them and broadly to all. Since Ostrom (1990) shifted the paradigm for the commons from Harding's (1968) pessimistic one to a dynamic and practical one in her seminal work, *Governing the commons: the evolution of institutions for collective action,* the study of the commons has proved a very productive area for sustainable development. Not only traditional common-pool resources (CPRs) such as coastal fishery (Ostrom 1990), rangelands (Prediger, Vollan, and Frolich 2011, Sneath 1998), or forest (Chhatre and Agrawal 2008, Rustagi, Engel, and Kosfeld 2010), but also even knowledge (Hess and Ostrom 2007) or the atmosphere for CO_2 sink (Dietz and Zhao 2011, Heitzig, Lessmann, and Zou 2011, Santos and Pacheco 2011, Shiva 2008) is now normally described as the commons. Of course, not all resources are the commons. The commons is only one type of property regime and there are other types of them. However, "(p)roperty is a social instrument, and particular property regimes are chosen for particular social purposes" (Bromley and Feeny 1992:4). In other words, whether a resource is the commons or not depends on the context and history of a particular society and ultimately all the resources can be the commons. Then, a particular commons - the data and knowledge of the commons - is an essential prerequisite of sustainable development pursuit. There are several issues to point out.

First, the studies on the commons usually focus on what are the conditions in which a common-pool resource (CPR) can be sustainably maintained and how. For example, Ostrom (1990) extracts eight design principles by which CPRs successfully maintain based on

empirical cases around the world.[68] However, no matter how many such conditions or principles can be extracted from case studies, it is reasonable to judge that such successes do not guarantee institutional durability and long-term management at the local level, considering the fact that the globalized world is accelerating the scale of interactions between local systems (resource and user) and external social, physical, and institutional environment (Agrawal 2001). Moreover, it is likely that the conclusions of the commons studies are relevant mainly to the case studies themselves and therefore they are not as applicable to practical sustainable development matters as they promise and they may be mere stories or wisdoms in the wake. Nevertheless, recent development of the commons studies shows great expectations for sustainable development by providing new ways of framing sustainable development issues. For instance, by conjoining the game theory and the commons idea, innovative strategies or schemes of global cooperation to cope with climate change such as 'linear compensation' model for reducing CO_2 emissions (Dietz and Zhao 2011, Heitzig, Lessmann, and Zou 2011), or 'polycentric' approach for simultaneous multilevel international cooperation (Ostrom 2010, Santos and Pacheco 2011).

Second, while the researchers describe the commons as the dynamics between CPRs and people who share them, how does the individual approach the commons in their life? Speaking differently, though researchers are interested in the conditions or mechanisms of the commons, the individuals who are the appropriators of the commons see the commons in a very different perspective. The term 'assets' may be useful to make this point more clear. The commons studies emphasize CPRs - the resources. However, what the individuals are

[68] The eight principles are: 1) Clearly defined boundaries, 2) Rules regarding CPRs adapted to local conditions, 3) Collective-choice arrangements that allow most resource appropriators to participate in the decision-making process, 4) Effective monitoring by monitors who are part of or accountable to the appropriators, 5) Graduated sanctions for violations, 6) Easy and cheap mechanisms of conflict resolution, 7) Local autonomy recognized by higher-level authorities, 8) Nested levels of appropriation, provision, enforcement, and governance.

directly concerned about is not so much the resources themselves but how they can access them, and when and how much. Individuals look CPRs through the lens of 'assets'. As Boyce and Shelly (2003:2) say, "(r)esources are things; assets are relationships between things and people". Individuals have to get benefits from the commons by means of assets.

These days, assets are usually meant economic assets such as real estate, stocks, or bonds but the main interest in this study is natural assets. What I argue in terms of sustainable development for the commons is that, no matter what economic expectations there will be, or no matter how much compensations can be distributed in return for the disposal, natural assets of which a commons is composed of should not be disposed. To promote sustainable development in a region, focusing on maintaining natural assets in the region would be better than focusing on looking for the successful conditions or mechanisms of the institutions that govern the commons in the region. Some may ask, 'what is the substantial difference between maintaining natural assets and developing good governance of the commons?' After all, the ultimate goal of both of the two is to maintain sustainably the concerned natural resources, is it? There is a fundamental difference, which is about the strategy for decision making. If enough time and information to investigate the chain of interactions among the natural resources, local people, and external environment can be given, the institutional approach for good governing designs will be definitely better. For, based on such information, the institution of the commons may be better to decide to transform the whole natural assets to another form of assets like financial assets.[69] The problem is that most communities today cannot afford to have such time or information, considering the accelerating rate of change

[69] A classic example is the case of Nauru. The Nauruan invested all the money in return for their natural assets (phosphate mines and the fishery) in the financial asset - a trust then amounting to US $ 1 billion not in any natural asset. After the Asian financial crisis in the 1990s, the trust is gone nothing and the population has to be relocated (Folliet 2009, Gowdy and Krall 2009, Gowdy and McDaniel 1999, McDaniel and Gowdy 2000).

and the complications of interlinked CPRs (Ostrom et al. 1999). After reviewing the performances in terms of reduction of greenhouse gas emissions, Giddens (2009:88) find that the top performer countries such as Sweden, Iceland, New Zealand, and Costa Rica occupy the positions because of a preoccupation with energy security rather than climate change. In other words, their tactical focus on more tangible objective brought about more desirable results. Therefore, as a strategy, natural assets - the tangible aspect of the commons - should be given a priority to deal with the uncertainty and urgency that the commons faces today.

To individuals in *Gyehwa*-township in the past, the tideland was a natural asset. There were justifications for disposing the natural asset in favor of the reclaimed land in which more modernized landscapes would take place. Cost-benefit analyses in economic terms played main roles among them. For example, the most influential report by the official organization, the Citizen-Government Joint Investigation Team to Assess the Environmental Impact of the *Saemangeum* Project (the JIT, in action during 1999 - 2000, 2000) (the JIT, in action during 1999 - 2000), *Evaluation Report of Environmental Impact of Saemankeum Project*, provided a result that, at even the worst case, the rate of return on investment (ROI) of the STRP would be 9.1% or higher and cost-benefit ratio at the discount rate of 8% would be 1.25.[70] Let us just assume that the economic output confirmed the cost-benefit analysis. Let us assume that people are now in average better off than before the STRP began. Even if the result would be just like that, there is something strange here. Without all of the eco-system services and economic benefits from the products in the mudflats[71], how can we

[70] J. K. Lee (2001:60) says, "'the benefit-cost analysis in the Evaluation Report of Environmental Impact of Saemangeum Project' [the result of the JIT] is, in a word, a representative example of distorted evaluation. I even feel sorrow at the current actuality in which a large scale public project costing several trillion won is justified by such a coarse and poor feasibility analysis".

[71] The Korea Ocean Research & Development Institute provides the result that mud-flats is 3.3 times more valuable than the paddy filed based on a foreign research on the value of ecosystem services and natural capital

explain the fact that the local people are now better off economically? **Who and what is now providing the difference from?** How have services and benefits, plus the standard of living increased?

Whether or not the sustainable development indicators of the two townships show significantly different values is the main question of this study. If the answer is no, the question '**who and what is now providing the difference'** should be answered. Specifying the exact who and what would be very difficult but the mechanism could be easy to explain - displacement and rebound effects. Somewhere in the world, someone or some eco-systems must be now providing the difference, regardless of whether that someone or that some eco-systems manage within their own boundaries. Once a natural asset is gone, for people to maintain their standard of living, they have no choice but to depend on natural assets elsewhere. The commons is the prerequisite knowledge for sustainable development studies. Natural assets are the core of the commons.

Third, while it is true that the commons studies opened a promising research arena, what about the non-commons such as privately held property and assets? If we consider the industrialized world, what is the ratio between that which the commons regime occupies and that which non-commons regimes occupies? There is no way to unravel the complicated mechanisms and design principles that govern the non-commons world, but it is certain that most of everyday life in the industrialized world is composed of the non-commons. Which influences more the unsustainable path of our globalizing world? Nobody doubts that the non-commons regimes should be responsible for the trends opposite to sustainable development direction. Sustainable development researchers are keen of the status of the

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(Costanza et al. 1997). Several studies by the project advocate group show that the value of paddy field is 1.4 ~ 2.64 times higher than that of mudflats (for example, see Hong 2004).

global commons such as tropical rainforest, ocean marine resources, forest management in the developing countries, and now the atmosphere as the sink of CO_2. However, it seems to me that they do not give a comparable attention to the causal chains why those global commons become so in danger - the externality of displacement and rebound effect for such commons' fates. The same can be applied to the local commons. Although many, almost all of the environmental organizations and academic institutions in South Korea made desperate efforts to prove the economic, ecological, aesthetic, or spiritual values of the tidal flats inside the project area during the first stage of the STRP (1991 - 2006), they failed to disclose the evil connection between the absence of the tideland and the invitation of displacement and rebound effects. Inside the mundane life of the industrialized world exist the mechanisms why the commons suffer now. Existing sustainable development studies lack the concepts, tools, and empirical data to deal with the relationship between the commons and the non-commons world. This study is a small step towards such efforts.

3.4 A Cross-section of the Jungle: Anthropology and Sustainable Development

Although not comparable to such exponential growth of general sustainable development studies[72], works by anthropologists show steady contribution to sustainable development. Ethnographic methods enable anthropology to make key contributions to the literature on sustainable development in various areas.

First, in line with the long tradition of development anthropology (Ervin 2005), anthropology reveals neglected factors and actors in pursuit of sustainable development

[72] Refer to footnote 51 in page 53.

projects. For instance, some anthropologists have illustrated the failure of a sustainable development project due to the alienation of the poor or local people (Wali 1993) as well as due to the overestimation of the autonomy of the local indigenous community (Berlin and Berlin 2004). Anthropology also emphasizes how social and cultural components are occasionally dwarfed by economic and environmental concerns (Eckert, De Beer, and Vorster 2001, Rytilahti and Narbrough 2007, Saydaie 2003). One of the primary interests in anthropology has been what is called 'participatory development' (i.e., Davies and Wismer 2007, Gebremedhin and Theron 2007, Luján Alvarez, Diemer, and Stanford 1999), which is tightly coupled with the need for local 'empowerment' (Barrett et al. 2005, Leube and Fernandez-Abad 2001) as well as the participation of external actors, especially NGOs (Jacobsohn and Owen-Smith 2003, Thomasslayter 1992, Ur-Rehman and Chisholm 2007). Moreover, anthropological knowledge has been directly used for sustainable development when anthropologists participate as a key player in planning national level sustainable development project (e.g., Bozzoli 2000) or when anthropologists define sustainable development indicators based on applied ethnoecology approaches (Nazarea et al. 1998) and when they further sustainable development by suggesting new area such as permaculture (Veteto and Lockyer 2008) or natural disaster preparedness (Suda 2000).

Second, as studies on sustainable development became diversified and specialized subareas emerge, anthropologists also began to pay attention to those areas. For example, to address the local participation in more comprehensive and inclusive way, institutional frameworks are necessary (Hyden 2001), which is handled under the label 'governance' and the commons (Agrawal 2003, Haller 2002, Natcher and Hickey 2002). Anthropologists take part in another major area of sustainable development, i.e. - sustainable development

education - not only by engaging in conceptual or methodological development but also by providing a practical educational program, especially in higher education level (Barlett 2008, Boyer 1997). Ethno-scientific knowledge or 'traditional ecological knowledge (TEK)' is always a particular interest to anthropologists and they realized that TEK could play a crucial role in pursuing sustainable development. For instance, the local ethnomedicinal knowledge and practices among tribal communities in Chhattisgarh state in India have opportunities (and of course challenges as well) to develop a competitive herbal medicines in the world market (Pati 2005). Apart from TEK directly based on local environment such as flora and fauna, belief system, religious rituals and customary activities can also be regarded as extended forms of TEK, which can influence sustainable development projects both positively and negatively. For example, traditional religious beliefs and traditional leaders are discovered as crucial elements in conserving remnant patches of a unique type of dry forest in the Zambezi Valley of northern Zimbabwe (Byers, Cunliffe, and Hudak 2001); the resource management practices of the reefs in Papua New Guinea and Indonesia illustrate the significance of the customary practices (Akimichi 1995). Ignoring the indigenous pastoralists' technical and organizational capacities by poorly adapted development interventions in Ethiopia contributed to land degradation, the erosion of social structures and poverty (Homann et al. 2008). Direct conservation of the ecosystem such as 'biodiversity hotspot' by establishing restricted areas or national park systems must be a top priority of the mainstream sustainable development efforts. Anthropologists' main interest in conservation is the local people in and around the conservation areas because: 1) the integration those people into conservation efforts is one of the most important touchstones of the success of such areas as shown in the Maasai in the Ngorongoro Conservation Area in East Africa (McCabe 2003a, McCabe

2003b), and the Guarani in Bolivian Chaco (Arambiza and Painter 2006), and; 2) the local communities may resist the rigid standards and requirements set by the international conservation authorities as exemplified by the case in the Great Limpopo, one of the largest Transfrontier Conservation Areas (TFCAs) in the world (Spierenburg, Steenkamp, and Wels 2006).

Anthropologists have focused attention on the contributions of ecotourism to sustainable development, too. Ideally, the primary beneficiary of tourism development should be the local people, and this is more likely to be the case if the development is structured in a culturally appropriate way, by being given the right to make land use decisions and benefits beyond just economic ones (Charnley 2005). If not, then, conservation efforts can be compromised by overdevelopment for tourism (Olsen 1997) or local communities can face negative impacts by the management of the large for-profit corporations (Feng 2008). Well designed and managed (eco) tourism projects can be beneficial to local people not only financially (Brightsmith, Stronza, and Holle 2008, Mbaiwa and Stronza 2010) but also socially and culturally (Mbaiwa and Stronza 2011, Stronza and Pegas 2008). Notwithstanding, these benefits can have mixed consequences for the people in the long term through the perturbation of the stability of local institutions or revived pride in indigenous culture (Stronza 2008, Stronza and Gordillo 2008). Anthropologists also suggested new areas for sustainable tourism like heritage tourism (Reid and Schwab 2006) or religiously motivated activities (DeTemple 2006).

Fourth, one of the strengths of anthropology is its reflective and critical characteristic. As such, it is no wonder that the concepts and practices of sustainable development are also the target of the criticisms by anthropologists. In the quest for sustainable development, the

production and commercialization of folk arts and crafts is often encouraged but it is not certain whether such promotion under the label of sustainable development results in what it originally intends to bring about. For example, although the commercialization of basketwork of the Baniwa in the Northwest Amazon had goals of generating income and leadership for indigenous producers, it also resulted in conflicts between the western economic values and traditional egalitarian values, which reflected in the increase of witchcraft accusations (Wright 2009). A similar case was reported in Mexico, too (Carruthers 2001). Postmodern critique, discourse analysis, and Political Ecology have played major role in criticizing mainstream sustainable development pursuit separately and collectively, by revealing the unintended consequences of sustainable development (i.e., Carr 2008, Escobar 1995, Nadal 2003, Snodgrass et al. 2008).

Last, among the critical approaches to sustainable development by the anthropologists, more attention needs to be paid to Political Ecology, considering that it has originally developed as an effort to reveal the dialectic power relations between the essential three pillars of sustainable development concept – the environmental (ecology), the economic, and the social (Blaikie and Brookfield 1987:17, Greenberg and Park 1994:1, Peet and Watts 1996:6). As the concept of 'ecology' has been transformed from a static and equilibrium-oriented one to a non-equilibrium or nonlinear thinking, so has the anthropological adoption of the concept shifted from the equilibrial, ecosystem based works (for example, Rappaport (1967)) through the processual approach (as summarized by Orlove (1980)) to the full encompassing of politico economic processes – Political Ecology.[73] For instance, environmental degradation is not so much a matter of the constraints or failure of human

[73] For a brief summary of the transformation of the 'ecology' concept in anthropological studies, refer to Scoones (1999).

adaptation as a matter of justice regarding human rights abuse through not only the political/economic institutions or processes but also even the cooptation of the legal structure (Johnston 1994a). Therefore, the compensation for the ecological destruction and human rights abuse among the survivors in the Marshall Islands caused by the US nuclear weapons testing must reflect not the mere value of real estate or healthcare costs but the actual sociocultural damages and losses that interweaved with the ecological landscape, expressed and represented by the Marshallese themselves (Barker and Johnston 2000, Johnston 1994b). As such, anthropologists have contributed to this new discipline by strengthening its typical characteristics - revealing the local environmental consequences imposed by the external forces (i.e., in the OK Tedi mine, Papua New Guinea (Johnston 1994c)), or water scarcity problems across the world manufactured by privatization (Johnston 2003).

Not only that, anthropologists have diversified Political Ecology through their trademark of research method – the fieldwork. For example, the indigenous peoples in Misima and Lihir Islands in Papua New Guinea defy the notion of 'noble primitive ecologists' and use even the environmental degradation (from mining) as a kind of resource rent for generating income (Macintyre and Foale 2004) and a seemingly fundamentalist religious people in New Caledonia engage themselves with their environment based on the individual's socio-economic concerns rather than on their religious attitudes such as 'stewardship' or 'exploitation' (Horowitz 2008). Well-known issues of sustainable development are specifically dealt with by Political Ecology approach by anthropologists, too. The discrepancy between 'climate change' discourse in general and local interpretation of it by the Sahel farmers shows that, though the local farmers are well aware of global climate change narratives, their actual response to them is mainly based on economic and political

factors (Mertz et al. 2009). Conservation versus the indigenous people's right to use the resources can be another example, as shown in the case of the Calakmul Biosphere Reserve in Mexico where the successful management of the reserve lies at the juncture between the local farmers' ethnoecology regarding the forest as 'work place' and the scientists' and conservationists' image as a 'park' while there exist another group of people who utilize both of the two views for their own socio economic interests (Haenn 1999).

All of these approaches are relevant to this study of the STRP. TEK of tideland can be utilized in the second stage of the project and the lessons of the eco-tourism studies can also be made use of in the internal development.[74] Governance of tideland resources by communities, which is still being practiced in many other tideland environments in the southern and western coast of South Korea[75], can be better managed by adopting the accumulated knowledge of the commons. These approaches can be regarded as ways to understand the conditions or factors whether the lives of the two townships are sustainable development oriented or not. Reporting the perturbation of cultural or institutional life of local people in an eco-tourism project (i.e., Stronza 2008, Stronza and Gordillo 2008) or developing customized sustainable development indicators based on the ethnoecology of the indigenous people (i.e., Nazarea et al. 1998) can be examples of such approaches.

3.5 Individuals in the Jungle: a Blindspot or a Cul-de-sac?

Individuals are encouraged to take part in sustainable development by such activities as

[74] Currently, in *Simwon*-township, the villagers' knowledge of managing the mudflats is used to attract tourists in the title of '*Gae-Ppul-Che-Hum* (experiencing mudflats)'. Refer to Section 5.2.4 – eco-tourism. This type of eco-tourism – utilizing the mudflats – may be applied to the STRP as an eco-friendly internal development.

[75] About the community level governance of tideland resources, see Kim (2009).

sustainable consumption (SC) or green consumption. There are enemies to such encouragement.[76] Corporations use advertisements to manipulate consumers on a psychological level. Sometimes, they even 'greenwash' their products and their corporate image. However, the true "enemy" to sustainable development may be individuals themselves. When people (especially the wealthy living in industrialized countries) are asked to change their consumption habits, they often refuse not because they do not support the idea of sustainable consumption or sustainable development, but because current patterns of consumption are an important part of their identity in today's consumer-oriented world.[77] Hamilton (2010:74) provides strong explanation for this problem;

> When we ask affluent consumers to change their consumption behaviour we are asking of them much more than we realise. The purpose of the shift in marketing from promoting the qualities, real or imagined, of a product to promoting brands as a lifestyle choice was to exploit the modern need to construct a sense of self. If we have constructed a personal identity in large part through our consumption activity, and consuming is how we sustain ourselves psychologically from day to day, a demand to change what we consume becomes a demand to change who we are. If, in order to solve climate change, we are asked to change the way we consume, then we are being asked to give up our identities—to experience a sort of death. So firmly do many of us cling to our manufactured selves that we unconsciously fear relinquishing them more than we fear the consequences of climate change.

Surely, sustainable development does not seem to make friends with individuals as the

[76] There are many studies on the obstacles to SC. For example, the choices for more environmentally friendly goods may bring about doubts and insecurities about the choices to be made to the customer (Connolly and Prothero 2008). Once having made a better choice in terms of SC people may make a worse choice because they think they can as a reward for a better person (Mazar and Zhong 2010). Global political economy may have to be first rectified before people can reach SC (Cohen 2010, Schor 2005).

[77] There are various and close relationships between human consumption and the material world (Colloredo-Mansfeld 2005). The relationship between identity and the consumption can be exposed through the analogy of Csikszentmihalyi and Rochberg-Halton′s (Csikszentmihalyi and Eugene 1981) insight into the dynamics between the meaning and consumption of things.

sustainable development researchers wish it to. How can lay people be blamed for not following sustainable path of living, when Al Gore, one of the most revered preachers of sustainability, a person who even earned the Nobel Prize for his contribution to promoting sustainable development, is frequently blamed for maintaining unsustainable life style?[78] To sustainable development, individuals do seem to be the inconvenient truth. Then, how can we approach individuals in terms of sustainable development?

Many scholars emphasize that individual's direct concern is never so much sustainable development or sustainable consumption as the resilience of livelihood and quality of life . One of the challenges of encouraging sustainable consumption at the household level, as Hess (2010:26) points out, is that "acute environmental, political, and economic instability encourages households to worry less about reducing their ecological footprint and more about having the resilience to withstand potential socioeconomic and ecological shocks". In order to reconcile such individual tendency and collective goal of sustainable consumption , Hess (2010) suggests that policies should focus on encouraging economic storage (such as savings, insurance, and education) instead of consumption when there is more disposable income. In other words, he calls for paying attention to 'resilient consumption' to understand what sustainable development (or sustainable consumption) means to individuals. Including resilience consumption, more general approach to individual in terms of sustainable development can be quality of life. One of the most significant contributions to quality of life studies is provided by Stiglitz, Sen, and Fitoussi (2009), which articulates the main objective features shaping quality of life such as health, education, personal activities, political voice and governance, social connections, environmental conditions, personal insecurity and

[78] Al Gore has been criticized because of his hypocritical unsustainable life style. For example, ABC News Internet Ventures (2007) revealed that the averages of Al Gore family's utilities bill was $29,268 in 2006, and $31,512 in 2005.

economic insecurity. More importantly, it is recommended that, to develop relevant quality of life indicators, these objective features of quality of life should be incorporated with people's own description of their subjective well-being, along with assessment of inequality and the links between various quality of life domains. Considering the insight that "(w)hat we measure affects what we do. … The decisions they (and we as individual citizens) make depend on what we measure, how good our measurements are and how well our measures are understood. We are almost blind when the metrics on which action is based are ill-designed or when they are not well understood (Stiglitz, Sen, and Fitoussi 2009:9)", in order to address sustainable development issues in terms individuals, it is essential to develop indicators or measures based not on sustainable development terminology but on resilient consumption or quality of life.

However, only by concentrating on subjective, and of course not ignoring objective, measures of quality of life or resilient livelihood or by pointing out that the use of alternative measures instead of GDP per capita is essential for addressing individual level of sustainability, can we address the problem of 'consumption' that "[c]onsumers, even when they are environmentally concerned, are ***still consuming***, only they consume perceived green products and recycle more. ***The actual level of consumption is not identified as a problem***" (Connolly and Prothero 2003:288)? Individualization of the issues of sustainable development or sustainable consumption by putting accountability of sustainable development-related planet-wide problems on the 'individual' consumers (such as green consumerism, fair trade, or the campaign of promoting not using the vinyl bags or using the compact fluorescent lightbulb) hinders people from pondering "institutions, the nature and exercise of political power, or ways of collectivity changing the distribution of power and

influence in society" (Maniates 2002:45). Maniates (2002) calls this tendency 'the individualization of responsibility'.[79] This seems like a dilemma. Previously, I argue that 'individual' resilience of livelihood and 'individual' (subjective as well as objective) quality of life is crucial to understand what sustainable development means to individuals, but now do I point to the problem of 'individualization of accountability or responsibility'?

Even if we could not know the magical solution for sustainable development or sustainable consumption , we could tell when the sustainable development-enabled world would have come at last; needless to say, when most people live a life based on sustainable consumption and production. By the same logic, even if we cannot articulate how people have ended up with such unsustainable lifestyle and consumption (at least in the developed countries), we can certainly tell that the current human world is not sustainable. In brief, the 'individual' and 'individualization' dilemma dissolves when we look into the relationship between an individual as a being who has an identity (or identities) and the individualization process through which individuals can grow (develop!) and perform many socially acknowledged actions including (un)sustainable consumption. Nobody is born '*genetically*' as an (un)sustainable consumer. However, most people in the industrialized world grow '*epigenetically*' to become an (un)sustainable consumer.[80] In other words, individuals' (un)sustainable consumption is a result of a far-reaching processes and mechanisms.

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[79] This tendency has been prevailing in the area of marketing and consumer research for the last quarter of the twentieth century - 'micro focused' research, in other words, individualization of research object (Connolly and Prothero 2003:277).

[80] Originally, the term epigenesis referred to a philosophical stance (first developed by Aristotle) against the performation school over the controversies about the nature of development. The former supposed that, at the initiation of development, for instance in the fertilized egg, the system already contained some representative of every organ that would eventually put in an appearance. The vindicated theory of epigenesis, on the other hand, supposed that later appearing entities were produced during the course of development. The modern interpretation of epigenesist is that the unfolding of the genetic properties is gradually and progressively accomplished by the interactions with the environment (Britannica - The Online Encyclopedia).

Therefore when we ask why we do not consume sustainably, we should not ask why we do not purchase greener products or consume less but we should ask what are the processes and mechanisms of such an epigenetic result and how. This reasoning lead to not a conclusion but a beginning for the matter, ‘how can we approach individuals in terms of sustainable development?’ As for the meanings of sustainable development to individuals we focus on the livelihood resilience and quality of life and as to the unsustainable consumption we study the epigenetic mechanisms.

With regard to the epigenetic nature of sustainable development-related matters, Princen (2010) and Wilk (2010) suggest a useful analytical tool based on culture and language. To express the social change that is necessary for sustainable development, Princen (2010:60) quotes an American philosopher, Richard Rorty, “cultural change occurs not when people argue well, but when they speak differently”. Then he describes an epigenetic process through which people become a member of unsustainable society, by revealing what kind of metaphors people use to point to the environment - the machine, the laboratory, the bank, a store, a park, the frontier, a threat, the ‘commons’, a colony. For example, the laboratory metaphor persuades people into a belief that, to produce the inside world (the laboratory, i.e., our orderly environment) the outside world is consumed, which logically concludes in the denigration of the natural, non-laboratory world. Through the industrialization or modernization, people speak differently! Wilk (2010) also shows, based on the same theoretical ground - ‘metaphor theory’, how people have become ignorant to the important activities that use huge amount of resources such as sport, political rallies, research, and investing because those activities do not easily fit into the metaphorical category of consumption - for example, consumption as fire or consumption as eating. Princen (2010)

and Wilk (2010) suggest, as a way towards a different course of epigenetic processes, that we begin to speak different metaphors such as the environment as planet earth, the watershed, a network, the tide, a homestead, a gift, or the national banking system and we frame sustainable development-related issues differently so they appeal to other powerful values like justice and fairness.

Although it is extremely difficult to design a study or critique that is practically potential enough to shed light on the path towards the goal - understanding what sustainable development means to individuals, it is quite certain what a study or critique of sustainable development should not try to do. While revealing "why 'virtuous' diet foods are advertised alongside luscious 'sinful' cakes and extravagant dishes", Wilk (2001:254) reasonably suggests that "[t]he moral and intellectual critique of consumption may therefore be seen as having a secure role in the dynamics of consumer culture itself". If there is a moral commandment in the study of sustainable development, that should be, 'do not do such a sustainable development study or critique as has a secure role in the current unsustainable culture itself'.

3.6 Assembling a Set of Sustainable Development Study Tools

In this section, I briefly reviewed, first, the current trends of the mainstream sustainable development research, second, several theoretical issues of sustainable development especially relevant to this study, third, the anthropological studies on sustainable development, and fourth, how to apply the theoretical issues related with sustainable development to. It seems necessary to figure out a way how this existing body of

research on sustainable development can be utilized for the analysis of the two townships. To begin with, let me summarize the findings from the review.

1) Green growth - the mainstream discourses on sustainable development.

i) The existence of the obligatory ideas in dealing with sustainable development: Three pillar approach (environment, society, and economy). The diagnosis, prescription, and assessment of sustainable development based on specific languages (science & technology, policy, control & regulation, and economics & accounting).

ii) A secure and indispensable role of the emphatic treatment of the disadvantaged and the critique of the unsustainable status quo in the dynamics of unsustainable world.

iii) The huge scale of sustainable development studies: The scale that has a risk of bureaucratic contribution to replicate the existing unsustainable structures, which the sustainable development studies are determined to change.

iv) The continuous use of GDP (or per capita) to assess the achievement of sustainable development.

2) Theoretical issues of sustainable development

i) Displacement: Spatial displacement, temporal displacement, and displacement of responsibility. Displacement makes possible the perpetuation of unsustainable practices by the blinding effect of displacement.

ii) Rebound effect: Technological innovations & efficiency improvement, ironically, usher in more demands on the resources by substitution effect, income effect, and economy wide effect. Rebound effects explain why it is so difficult to achieve sustainable development only by depending on science & technology.

iii) The commons: The studies on the commons (CPRs) show positively the way to avoid 'the tragedy of the common'. The aspect as 'natural assets' is crucial for the individuals in terms of the commons. With natural assets gone, people, no matter how prosper they may be as the result of the disposal, invite displacement spatially and temporally.

3) Anthropological studies on sustainable development

i) Focus on local people: Anthropological practices and knowledge can be directly and indirectly applied to the local sustainable development projects.

ii) Governance, the commons, sustainable development education, and TEK: Ethnographic methods help to embody locally customized practices for newly emerging subfields of sustainable development.

iii) Eco-tourism

iv) Sustainable development research as a context-relevant critique - especially, Political Ecology approach

4) Meanings of sustainable development for individuals

i) Livelihood resilience and quality of life: Relevant questions for individuals in terms of sustainable development are not so much sustainable development or sustainable consumption but the resilience of livelihood and the subjective and objective quality of life.

ii) Epigenetic dynamics: Unsustainable current consumer culture is a result of the far-reaching mechanisms of individual's socialization processes. Using a new set of metaphors can help change such unsustainable epigenetic development of individuals.

These findings can be diagrammed as follows and will be applied in the following Sections (see Figure 10).

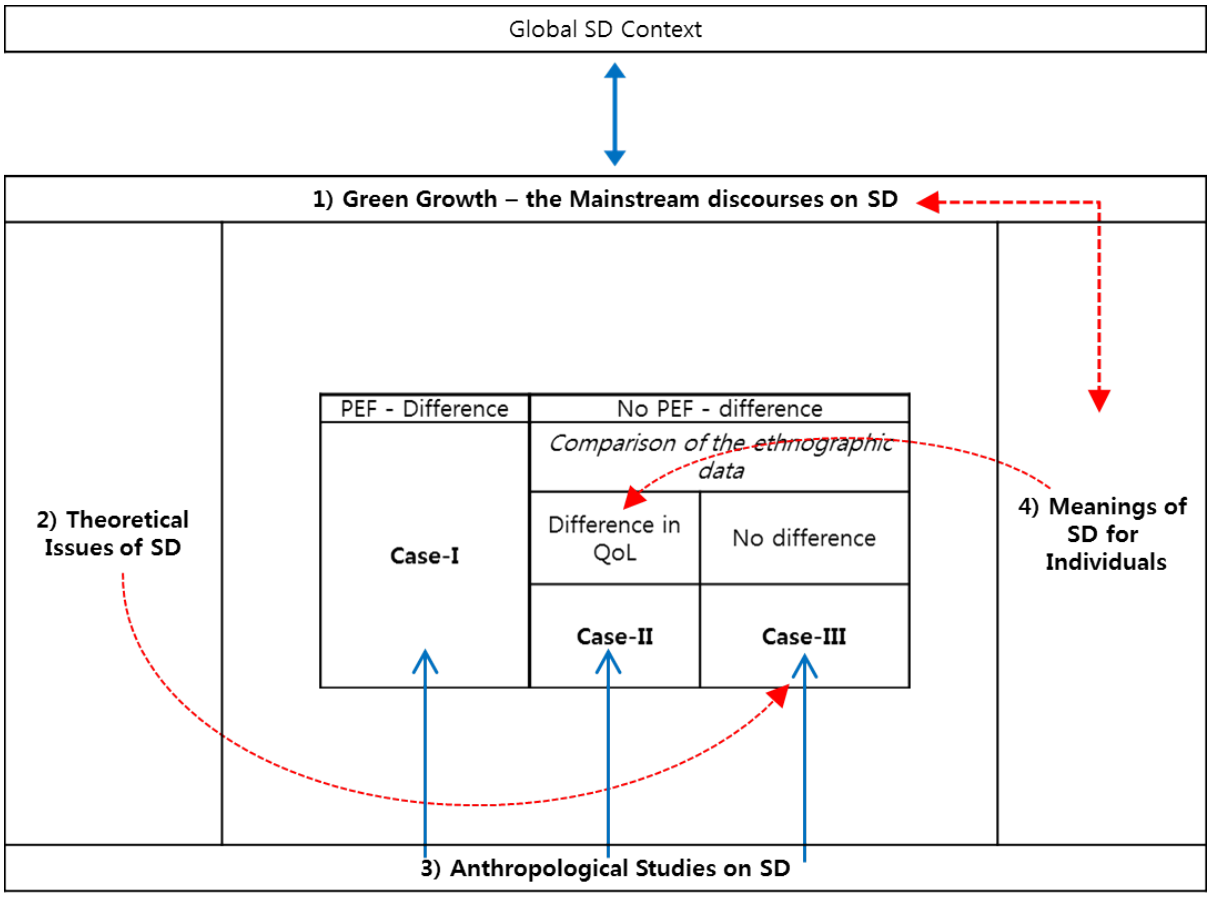

Figure 10. Application of sustainable development tools in the analysis of the two townships.

The above is an application of the assembled sustainable development tools. Individual's resilience of livelihood and quality of life can be used to check the difference of quality of life between the two townships. In case of Case-III, the theoretical analysis based on displacement, rebound effect, and the commons can be used to explain the non-existence of the quality of life and Personal Ecological Footprint differences. In addition, the long pursuit of economic growth (and now green growth) in South Korea at the country level can interpreted as an epigenetic background for the individual's consumptions or metaphors. Global context of sustainable development can also be used to assist such interpretation. In

all analyses, anthropological knowledge based on the fieldwork provides the context. Of course, other linkages such as the relationship between the Case-III (no difference in terms of personal ecological footprint) and the national level of (sustainable) development discourses can be considered.

4. SUSTAINABILITY OF CONSUMPTION - PERSONAL ECOLOGICAL FOOTPRINT OF THE TWO TOWNSHIPS

4.1 General Comparison of the Two Townships

How do people influence their environment? How can I measure the burden that the people in *Gyehwa*-township and *Simwon*-township impose on their environment? All the answers must be in their living place and their everyday life. To outsiders, visiting the two townships would give a similar pattern of movements.

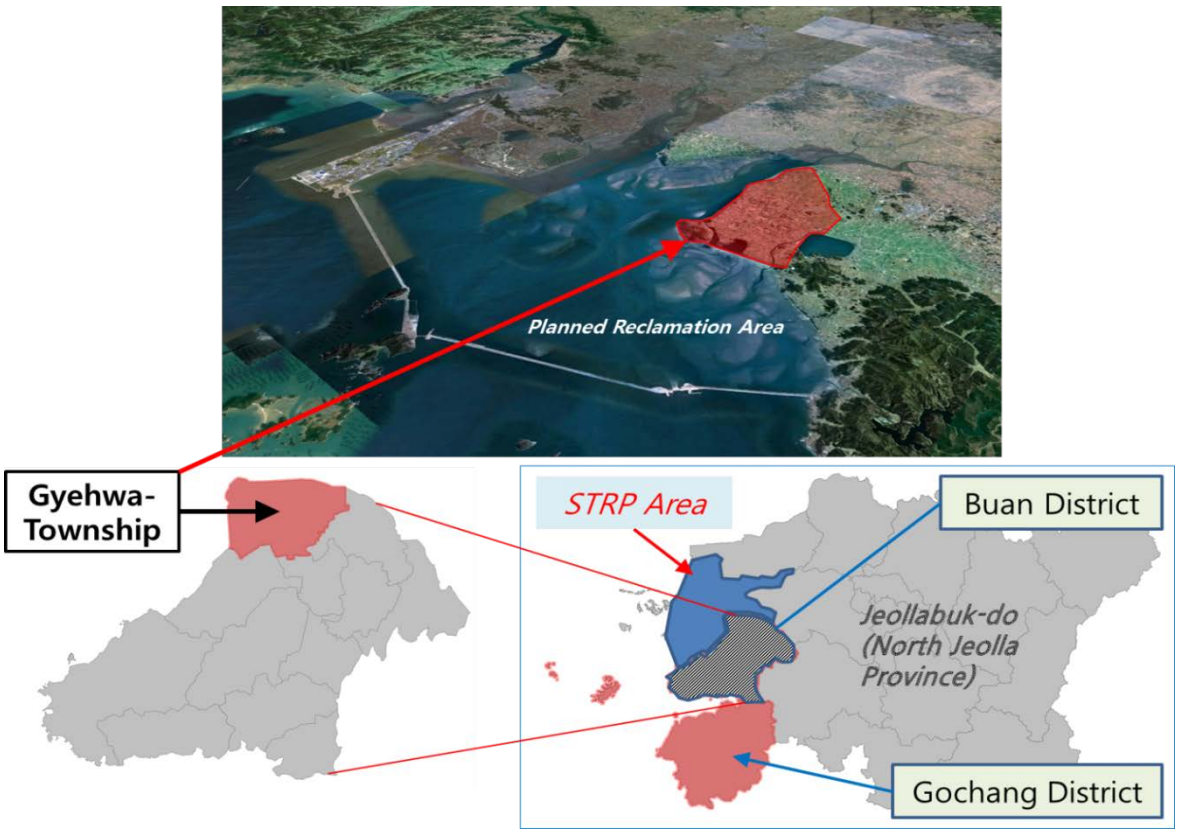

Figure 11. The location of *Gyehwa*-township in North *Jeolla* province.

After reaching the near district center, *Buan* district for *Gyehwa*-township, taking a yellow local bus about twenty minutes trip, passing the township office around which main public and private institutions like the postal office, local public health center, banks, or corporate offices are located, finally one can arrive at the villages. Each village contains houses generally surrounded by a vegetable garden and communal places such as a village hall or pavilion (Figure 11 and Figure 12).

Figure 12. Gyehwa-township. (1) The primary public transportation - the local bus. (2) The township office. (3) An ordinary house beside which a vegetable garden is. (4) A village pavilion. (5) A deserted house (All photos taken in summer of 2010 by the author).

Simwon-township (and *Gochang* district) is located a little farther from Seoul and the provincial capital, Jeonju-si. One can follow almost the same pattern to reach a village - by way of the district terminal, taking a yellow local bus, and passing through the township office (Figure 13 and Figure 14). The local villagers' movements towards outside the township are the same as the outsiders. Many of them drive their car but there are still many people in the villages use the yellow bus. At a glance, the two townships seem very similar just the same as the two districts are alike (see Table 3 in Section 1).

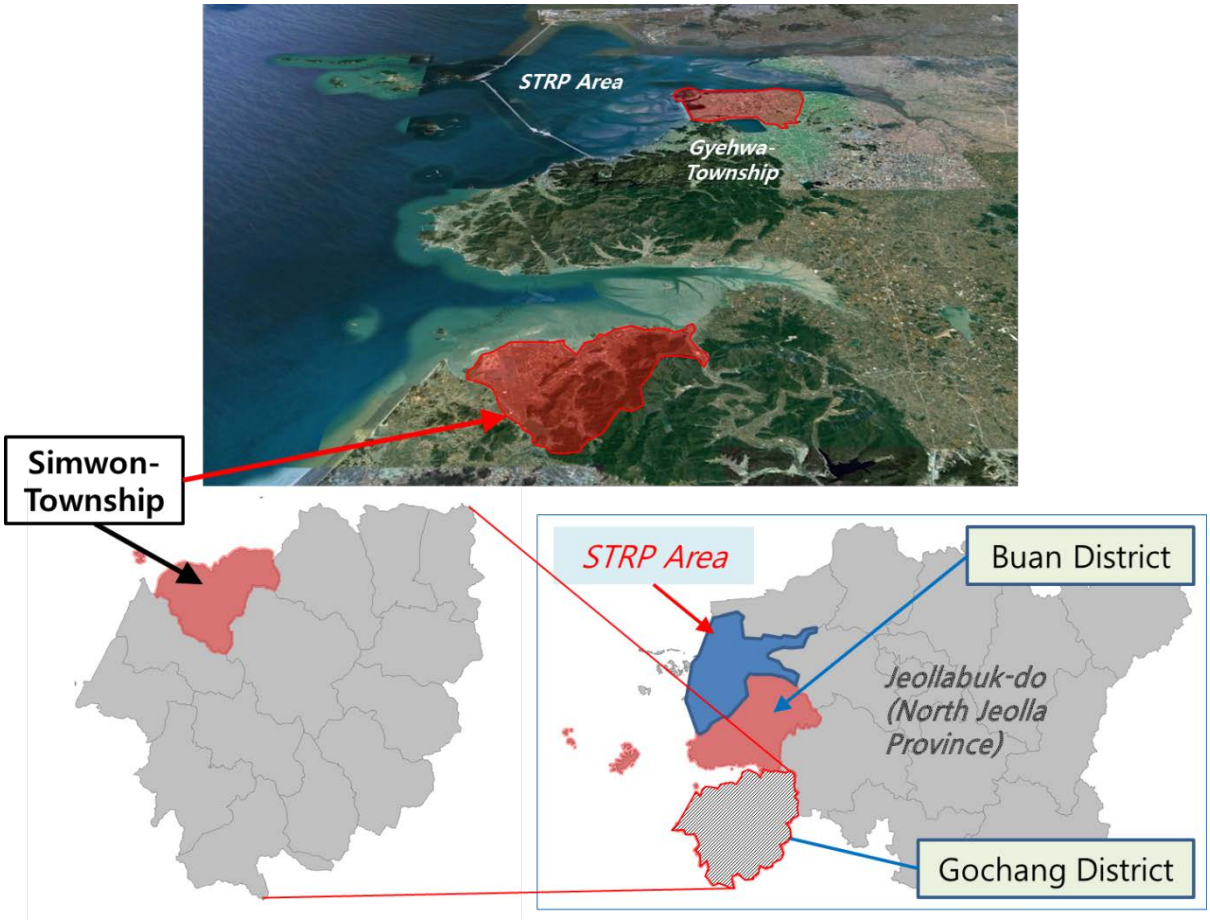

Figure 13. The location of *Simwon*-township in North *Jeolla* province.

Figure 14. Simwon-township. (1) The primary public transportation - the local bus. (2) The township office. (3) An ordinary village landscape including rice paddy and a vegetable garden. (4) A village pavilion. (5) A deserted house. (All photos taken in winter or early spring of 2011 by the author)

History also backs up the resemblance in the appearances of the two districts. North and South *Jeolla* provinces have been known '*Jeolla* province' or *Honam* region since 1018 A.D. in *Koryo* dynasty.(Gochang District History Compilation Committee (고창군지 편찬 위원회) 2009). Two prominent features, of which interaction intensifies each other, have engraved this region historically: 1) as briefly mentioned in *1.2.4 The progress of the first stage of the STRP: 1991 – 2006*, 'regional discrimination' against the region, and 2) the

granary of Korea based on the *Honam* plains.[81] In the past when rice farming was the primary industry of Korean peninsula (from the ancient times to the late 19th century), people in the two districts (in general, the people in *Honam* region) were exploited by local governors, officials, landlords, and the *yangban* class (the aristocratic class in *Chosun* Dynasty), which exploded as the *Donghak* Peasant's Revolution Movement in 1894.[82] The Japanese colonial government also realized the importance of the region for their food security by exploiting the peasant farmers while winning the landlord class over to their side.[83] The beginning in earnest of the large scale, modern tideland reclamation projects during the Japanese occupation can be understood as a result of such realization. *Buan* district and *Gochang* district were the focus of the reclamation. Even before the STRP began, the coastline had been made linear as currently shown through many reclamation projects during the colonial period (Hong et al. 2006, Moon 2000).

After the independence of Korea from Japan, however, *Honam* region has suffered from another type of discrimination through spatially unequal industrialization in South Korea.[84] The frustration and sense of being discriminated of the people in North *Jeolla* province was expressed voluminously and desperately by the provincial assembly in the

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[81] North *Jeolla* province is particularly suitable for rice farming. Not only is the crop land – *Honam* plains – large, but also the ratio of paddy fields compared to dry fields – 75% in 1999 is higher than any other provinces in South Korea (Moon 2000:240).

[82] The *Donghak* Peasant's Revolution Movement was one of the most important historic events in Korea towards modernization, which brought about the Sino-Japanese War (of 1894-95) in Korean peninsula. *Buan* and *Gochang* districts were part of the centers of the revolution movement. Refer to, for example, Kang (2007).

[83] In order to oppress the disquietness of the farmers in the region and to root out the ingrained peasant revolutionary movements, Japan performed 'the South Korea Great Subjugation Military Operation' in 1909 in *Honam* region by an army of 2,206, the police force as well as the marine force, resulting in capturing or killing more than 2,000 Koreans (Gochang District History Compilation Committee (고창군지 편찬위원회) et al. 2009). To win over the landlord class, the colonial government established favorable regulations for the landlords and did not impose income tax or property tax (Gochang District History Compilation Committee (고창군지 편찬위원회) et al. 2009).

[84] Refer to the Section *1.2.4 The progress of the first stage of the STRP: 1991 – 2006* and Figure 5.

'*White Paper on the Relations of Lagging Behind of North Jeolla*' (The North *Jeolla* Provincial Assembly (전라북도의회) 1997). That is one of the main reasons why the people in North *Jeolla* have so adhered to the STRP.[85] They have high expectations that the completion of the project and the planned non-agricultural development will allow the region to catch up with other regions in South Korea with regard to true industrialization.

From such similar historical experiences, landscapes, and statistics at the level of district, one may describe the contemporary life of the villagers in the two townships and the influence on the environment by the people in a similar way. Such similarity can be traced to a variety of factors that have shaped the two townships as they are now - natural environment (the plains for rice paddy and the mudflats), livelihood means (agriculture and fishery), governance (the hierarchy of the nation - province - district - township - village - household, the local cooperative organizations such as mutual financial/communal aids and the spatial arrangement of main institutions according to the hierarchy), and historical background as described above.

One of the evidence of the similar trend of income level in the two townships can be found in the increase of car ownership rate. Gong (2003) shows that the car ownership in South Korea increased dramatically from below two million to more than fourteen million in 2003, especially rapidly for 1988 - 1997 adding more than one million annually. According to Yoo (1999), the variable that correlates the most with car ownership increase in South Korea is 'income'. Therefore, we can reasonably use the car ownership as a proxy measure of the relative income level of the two townships during the 1990s, which coincided with the period

[85] This is true to the people that I met during the fieldwork, too. Most of them, although some express the concern about the environment but even they also, want to see a leading edge industrial complex in the newly reclaimed land.

of the construction of the first stage of the STRP. The district level statistics is shown in Figure 15.

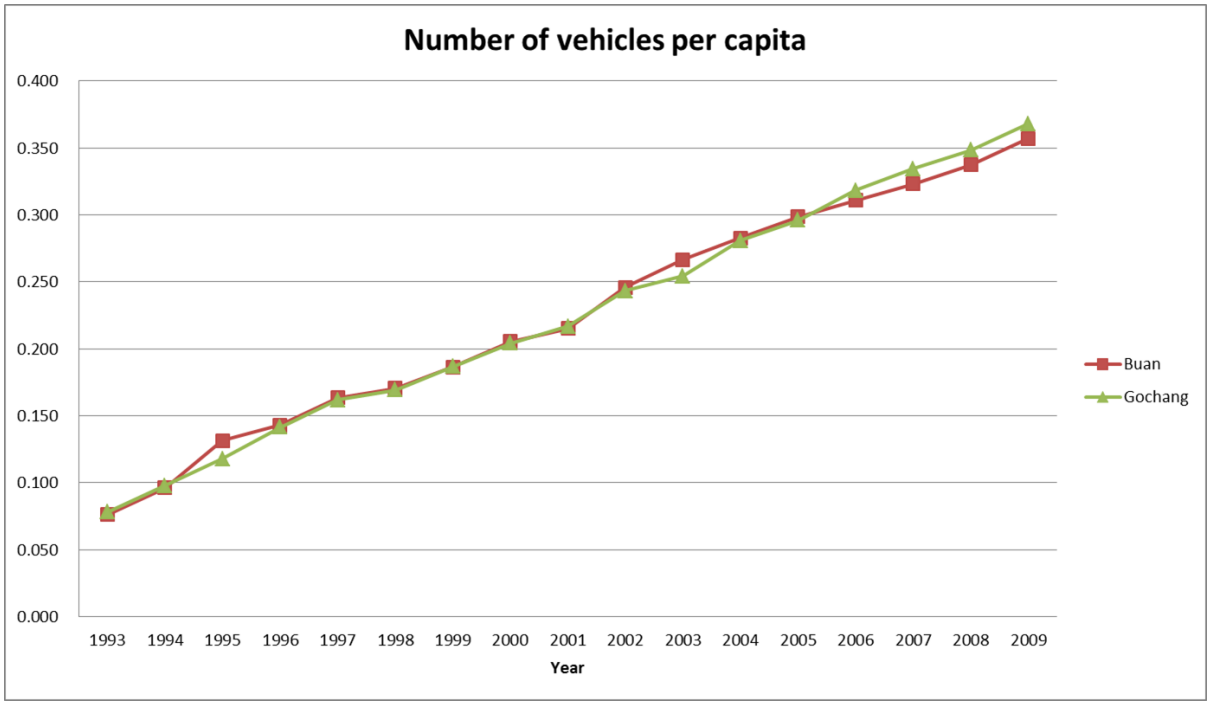

Figure 15. Number of registered vehicles (per capita) in *Buan* district and *Gochang* district.

There is no time series data for the township level, although there are partial data available which suggest that the two townships experienced the similar patterns of economic growth based on district level changes, as displayed below in Table 9.

Table 9. The registered number of vehicles in *Gyehwa*-township and *Simwon*-township.

	***Gyehwa*-township**			***Simwon*-township**		
	Before the STRP (1989)	As of 2009		Before the STRP (1989)	As of 2009	
Population	8,946	4,868	- 46%	5,828	3,022	- 48%
# of persons per household	4.3	2.2		4.2	2.2	
Registered # of vehicles	208	1,936*	9.3 times	100	985	9.8 times

Note: *) 2010 data

This picture based on the population trend and number of registered vehicles provides an evidence that the two townships experienced trajectories of change over the last two decades as the two districts (*Buan* and *Gochang*) have experienced, otherwise difficult to reveal due to the township level differences such as the ratio of farming versus fishery for the subsistence means or due to the lack of time series data. For example, in 1989, *Gyehwa*-township had the ratio of the number of farming household versus fishery household - 9 to 1, but in *Simwon*-township the ratio was 3 to 1 according to the annual district statistics. However, the official data only include the registered licenses for fishery and do not represent the bare hand clam collectors. Still, roughly speaking, *Gyehwa*-township has been more dependent on farming than *Simwon*-township. On the other hand, the villagers in *Simwon*-township are currently engaged in more diversified activities for their living such as aquaculture in the inland waters, the brewery of '*Gochang* Bokbunjaju' (a kind of native berry wine), and the mudflat clam gathering (a type of eco-tourism).[86]

In order to answer the first research question, whether the STRP is (un)sustainable to

[86] '*Gae-Ppul-Che-Hum* (experiencing mudflats)'. I will deal with it in Section 5.2.4 – eco-tourism

make the value of Personal Ecological Footprint in *Gyehwa*-township (higher) lower than that of Personal Ecological Footprint in *Simwon*-township, I assumed that the two groups had the same Personal Ecological Footprint before the intervention (the STRP) in this 'two-group posttest-only design without random assignment' (See Table 3, Bernard 2006:126-128). Of course, this assumption cannot be proved or disproved. In the next section, I will deal with Personal Ecological Footprint in detail, showing that the characteristics of Personal Ecological Footprint as a constructed value help to support the assumption with other indirect data before the STRP began.

4.2 Ecological Footprint (EF) and the Two Townships in 1989

4.2.1 Ecological Footprint[87]

Ecological Footprint is an innovative indicator which can show the quantitative demand on the (global) ecosystems by an individual, a country, and the world and, at the same time, the supply aspect of the ecosystems - the biological capacity of the (global) ecosystems. Ecological Footprint calculates and expresses the demand and capacity in a single universal unit – the global hectare (gha), which makes it simple and intuitive. Just as the national accounts or national account systems (NAS) are used to calculate the complete and consistent measure of the annual economic activity of a country such as GDP or GDP per capita, so are used the National Footprint Accounts to implement the consistent measure of the ecological demand (footprints) and biocapacities of the world and about 150 nations from

[87] This section is based on the Global Footprint Network site (http://www.footprintnetwork.org). As to the methodology, refer to GFN (2008, 2010b).

1961 to the present, expressed in Ecological Footprint (gha) or Ecological Footprint per capita (gha).

To begin with, as for the supply side of the indicator, the biocapacity of the earth is categorized into five types of surface area – land type: cropland, grazing land, forest, fishing ground, and built-up land. Because the five land types have different productivity, in order to be measured by a universal unit – gha – they need to be converted by using a conversion factor called 'equivalence factor'. In addition, the productivity of the five land types varies from country to country and year to year. Therefore, a factor is required to account for differences between countries in productivity of a given land type, which is called 'yield factor'. In short, each type of the biologically productive land and water (five land types) in every country is converted to a universal unit – gha – by using yield factor and equivalence factor.

As to the demand side of the indicator, the Ecological Footprint scheme divides human consumption into five components called the 'consumption components (or categories)' – food, shelter, mobility, goods, and services. The quantity of each consumption component or category in a country or of an individual is calculated by evaluating how much of the five land types of biocapacity are needed to meet the demand. As a result, the consumption activities in a country or of an individual are expressed as the same unit – gha – as the biocapacity.

Basically, Ecological Footprint is a measure at the level of a state or nation. Necessary data are gathered for a state and the Ecological Footprint per capita is calculated by dividing the state data by its population (see Figure 16). In addition, the sum of the state level data can be calculated and compared to the biocapacity of the earth, which shows us how many earths

the activities of human beings currently demand (see Figure 17).

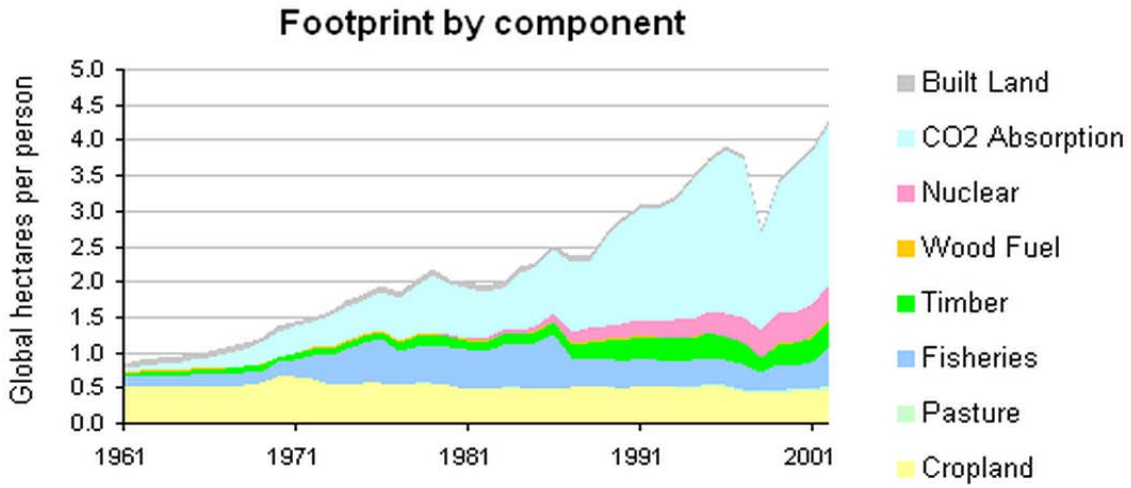

Figure 16. The components of average per person Ecological Footprint in South Korea. [from Global Footprint Network (GFN) (2005)]

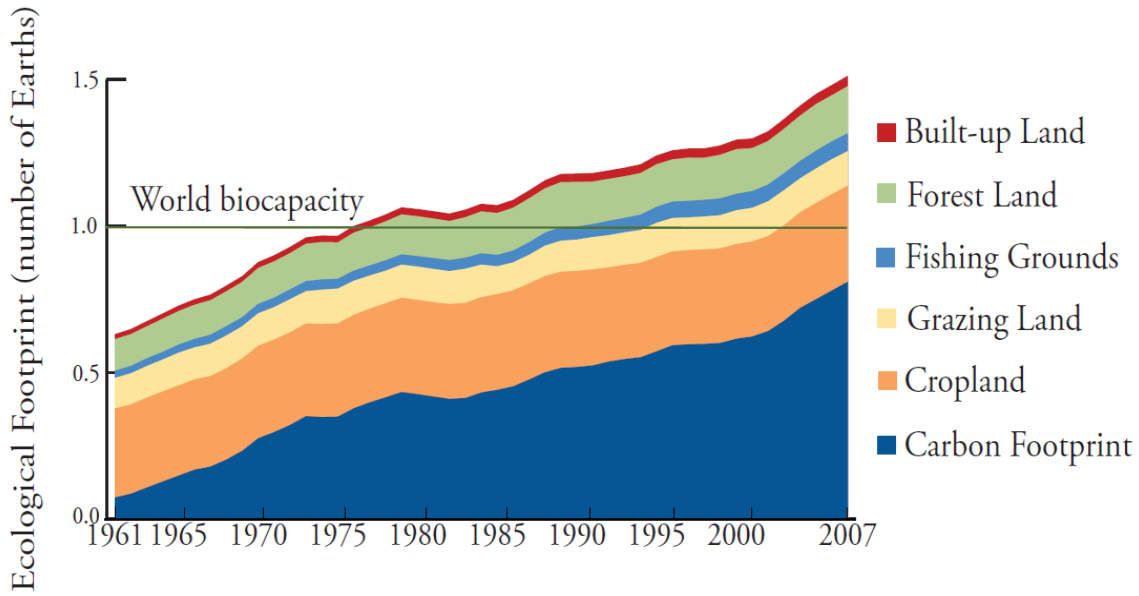

Figure 17. Humanity's Ecological Footprint, 1961-2007. [from Global Footprint Network (GFN) (2010c:18)]

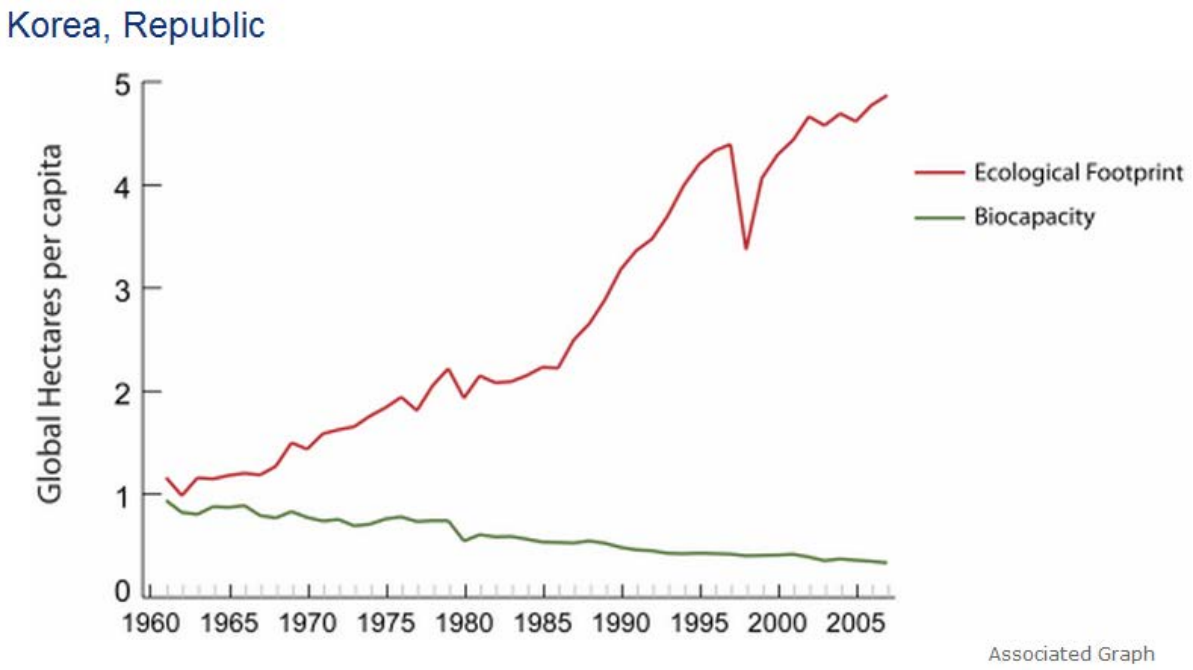

Figure 18. The tracks of the Ecological Footprint per capita and biocapacity in South Korea, 1961 – 2007. [from GFN (2010c)]

4.2.2 Ecological Footprint in the two townships in 1989

South Korea has already crossed two thresholds of Ecological Footprint. It shows overshoot already in 1961 in terms of Ecological Footprint versus its own biocapacity (see Figure 18). This does not mean that Ecological Footprint per capita in South Korea surpassed the global biocapacity per capita at the time. According to GFN (2005, 2010a), South Koreans seemed to have crossed the biocapacity per capita of the earth about 1990 when the total biocapacity per capita of the earth was 2.3 gha and South Koreans' Ecological Footprint per capita was about 2.42 - 2.7.[88] Although the Ecological Footprint value that is currently used cannot be said to reflect the accurate biocapacity of the earth and therefore the exact

[88] Based on the research, the EF values are different. For instance, Ma (1998) calculates EF per capita in South Korea in 1989 as 2.42 gha. GFN graph shows about 2.5 - 2.7 gha.

time when South Korea surpassed the global biocapacity per capita is questionable, it is certain that the current level of Koreans' consumption is much higher than the available planet capacity.

Ecological Footprint value is a real number (calculated as gha). However, it should be reminded that it has its own characteristics. First, when the values of Ecological Footprint per capita of two countries are below the global biocapacity per capita, it is not possible to declare that the country with the lower Ecological Footprint per capita is necessarily more sustainable than the one with a higher Ecological Footprint per capita. Based on other aspects such as quality of life and the trend of Ecological Footprint value change, the country which has higher Ecological Footprint per capita may be regarded as more sustainable. However, when both values of Ecological Footprint per capita of two countries are above the global biocapacity per capita, unless the trend of Ecological Footprint value change shows decrease, the country with the higher Ecological Footprint per capita should be said to be less sustainable in terms of sustainable development as defined in this study.[89] Second, White (2007) discovered from his study on the 140 countries' national footprint accounts, that each components of Ecological Footprint (food, forest, energy, and built environment) does not equally influence the inequality in terms of Ecological Footprint between countries (see Figure 19).

[89] Here, as to the treatments between two countries of which EF per capita is below the global biocapacity per capita and two countries of which EF per capita is above the global biocapacity per capita, the judgment would depend on individual's decision. However, I argue that, in case two countries manage their EF per capita below the global biocapacity per capita, the two countries should not be discriminated according to the absolute difference of the EF per capita values. I also argue that, in case two countries cannot manage their EF per capita below the global biocapacity per capita, the two countries should be dealt with differently according to their absolute values of the EF per capita. Polluters pay and the higher, the more.

	Concentration index	Share of Total Footprint	Share of inequality
Energy	0.545	0.537	0.656
Food	0.260	0.344	0.201
Forest	0.641	0.078	0.112
Built	0.349	0.041	0.032
Total	0.446	1.000	1.000

Figure 19. Concentration indices for total Footprint and its components in 140 countries, 2003. [from White (2007:407, Table 4)]

What White's work implicates is that, the difference in terms of energy or forest component of Ecological Footprint has more influence on the inequality of Ecological Footprint values between countries. For example, Energy use, which accounts for about 54% of Total Footprint, is responsible for approximately 65.6% of the overall inequality in Total Footprint. On the other hand, since the Ecological Footprint attributed to food consumption is relatively evenly distributed, it explains only 20.1% of overall inequality even though it represents almost 35% of Total Footprint (White 2007).

Third, Ecological Footprint is strongly correlated with GDP, urbanization level and world system position (WSP)[90] according to Mostafa (2010). The strong correlation between WSP and Ecological Footprint is also discovered by other studies with different descriptions such as 'structural associations between nations' (Jorgenson and Clark 2011), 'military expenditures & participation' (Jorgenson and Clark 2009, Jorgenson, Clark, and Kentor 2010), and WSP (Jorgenson 2003, Mostafa 2010). Except the GDP per capita, the level of

[90] According to White (2007), WSP is a world indicator developed by Kentor (2000), which is a multidimensional indicator that combines economic, military, and export dependence in one measure.

urbanizing is the strongest factor which correlates with Ecological Footprint per capita.

From the characteristics of Ecological Footprint per capita above and with other data such as Tables 3 and 7, Figure 15 about the two districts and two townships, the assumption of the research question (see page 25) - the equality of the Personal Ecological Footprint values of the two townships before the STRP - can be now more bolstered. First, in 1989, Koreans were about to surpass the biocapacity per capita of the earth. This must be mainly due to urbanization. According to Lee (2000), the urban population in South Korea increased from 28% in 1960 to 74.4 % in 1990 out of the total population. Most components in the Ecological Footprint - energy, food, forest, and built environment - are more sensitive to the impact of urban areas. The change of Ecological Footprint per capita graph in South Korea (Figure 18) shows a relatively steeper increase rate of Ecological Footprint during 1987 - 1997. Of course, the Ecological Footprint value in countryside must also have caught up with that in urban areas[91] in later years. Therefore it is highly possible that the first half of the steep increase ten year period was primarily led by the urban populations and the remaining countryside followed the suite during the second half of the period. At least, around the 1991, when the STRP dykes construction began, the two townships seemed to be in the status of being below the biocapacity of the earth in terms of Ecological Footprint per capita.

Second, as introduced above from White's study (2007), the energy component is the most responsible for the inequality in terms of EF per capita.

[91] As will be shown later in this section, the two townships have lower EF value than the national average - tentatively, about 20% lower. This study is not quantitative research on EF values; therefore, the numerical value must be far from accurate. However, it is certain that the two townships have fairly lower values of EF per capita.

Table 10. The contribution of each component to the total Ecological Footprint per capita in South Korea (unit: gha).

Base year	EF per capita	EF component			
		Food	Forest	Energy	Built-up land
1989	2.42[a)]	32.4%	43.4%	23.1%	0.8%
1995	3.36[a)]	32.1%	36.3%	31%	0.6%
2007	4.9[b)]	28.2%	5.3%	65.2%	1.4%

Note: [a)] 1989, 1995 data from Ma (1998), [b)] 2007 data from Global Footprint Network (GFN) (2010a).

According to Table 10, energy component (Carbon sink) was the main driving force of the rapid increase of Ecological Footprint per capita in South Korea 1989 - 2007. In 1989, not only the portion of energy component was relatively small but the Ecological Footprint value itself was also much lower than that of 2007. This means that, in 1989, it is highly feasible that the inequality of Ecological Footprint per capita was considerably less than that in 2007. If the values of Ecological Footprint per capita of the two townships should be statistically equal, it could more have been in 1989 than it could be in 2007.

Third, still, even in 1989, energy component must have been the most significant factor to the Ecological Footprint values in the two townships. The two townships still subsist on farming and fisheries, which seemed to ensure that people in the townships could procure most of their food within their regions.[92] Although there is not a good data for energy component of Ecological Footprint in 1989 for the two townships, there is data of cooking and heating facilities at the level of district (see Table 11).

[92] Seo, Lee, and Kim's (2008) study shows that, Koreans had meat intake of 47.3 g per day in 1990 whereas they had 95.1 g per day in 2006. As to dairy products, its intake increased 52.2 g per day in 1990 to 89.7 g per day in 2006. Considering that the difference between urban area and countryside in terms of food self-sustenance rate, the influence by food component on EF per capita in *Gyehwa* or *Simwon*-township seemed to be less than that by energy component.

Table 11. The number of household by fuel for cooking and heating facilities in 1990 of the two districts. [from National Statistical Office (1991)]

Base Year	**Energy Use**		***Buan* District**	***Gochang* District**
1990	Household		25,525	26,116
1990	Fuel used for cooking	Coal briquette	3,247	3,111
		Oil	574	366
		Gas	18,906	20,023
		Electricity	342	432
		Wood	2,155	2,096
		Others	301	88
		Total	25,525	26,116
1990	Heating facilities	Traditional fuel hole system	4,509	3,742
		Coal-briquette fuel hole system	2,310	1,333
		Piped coal-briquette boiler system	15,227	18,694
		Piped oil boiler system	3,256	2,056
		Others	223	291
		Total	25,525	26,116

As displayed in Table 11, the two districts show pretty similar pattern of energy use in 1990. It is not unreasonable to assume that the two townships bore close parallel to district level data - *Gyehwa*-township and *Simwon*-township had a similar energy component of Ecological Footprint per capita in 1990 (also refer to Table 9).

From the aforementioned reasoning, this study assumes that, the two townships satisfy the requirement for what Bernard (2006:126) calls, 'the static group comparison' for natural experiment (the STRP). Of course, this cannot be warranted in a strict way, because *Gyehwa*-township and *Simwon*-township could have a significantly different Ecological Footprint per

capita value in 1990. Nevertheless, I will deal with it after presenting the result of Personal Ecological Footprint comparison of the two townships in 2010.

4.2.3 2010-2011 Personal Ecological Footprint forecast of the two townships

What can we expect in the Personal Ecological Footprint values of the two townships in 2010 – 2011? From the existing studies on the STRP and the characteristics of Ecological Footprint discussed previously, it seems possible to forecast that the value of Personal Ecological Footprint in *Gyehwa*-township will be lower than that in *Simwon*-township. First, the villagers in *Gyehwa*-township, in average, should be more concerned about the environment or sustainable development issues considering that they, at least significant part of the township residents, took part in the anti-STRP movement during the heyday of the environment movement in South Korea (1998 – 2003).[93] Therefore, villagers could be living a more environmentally friendly life than those in *Simwon*-township, which would reflect in the Personal Ecological Footprint values.

Second, Personal Ecological Footprint is basically consumption level indicator that is based on an individual's spending on food, goods and services, housing, and mobility. Even if there were compensations for the villagers in *Gyehwa*-township who lost their subsistence basis due to the STRP[94], their income might not catch up with the level had it not been for the STRP by 2010 - 2011. In that case, the average consumption level of *Gyehwa*-township would be lower than that of *Simwon*-township, which therefore would lower the average Personal Ecological Footprint value in *Gyehwa*-township. However, this does not necessarily

[93] The nation-wide debate over the STRP versus the mudflat conservation in 1998 - 2003, refer to Choi (2006).

[94] The compensation caused by the STRP will be discussed in the Section 5. For majority of people who had been barehand clam collectors, the compensation was not enough for their loss.

mean that the quality of life in *Gyehwa*-township is lower than that of *Simwin*-township. The quality of life assessment based on the ethnographic data (will be discussed in the Section 5) may reveal the contrary result. In such case, in spite of the disposal of the mudflats, we can say that the life in *Gyehwa*-township has become more sustainable.

4.3 Personal Ecological Footprint of the Two Townships in 2010 - 2011

4.3.1 Seasonal adjustment of data.

The samples for Personal Ecological Footprint surveys in *Gyehwa*-township and *Simwon*-township is shown in Table 7, Section 2. The surveys in *Gyehwa*-township took place in summer during June - September, 2010 while those in *Simwon*-township took place in winter during November, 2010 - April, 2011. Due to the span of my fieldwork period, the data gathered for Personal Ecological Footprint cannot avoid the seasonal effects. Economic data such as unemployment statistics have been well seasonally adjusted. According to U.S. Census Bureau (1991), 'seasonal adjustment' means breaking down a time series data into trend-cycle, seasonal, and irregular components. Then, while retaining trend-cycle level estimate for each month (quarter) derived from the surrounding year-or-two of observations, the seasonal factors that are reasonably stable in terms of annual timing, direction, and magnitude are removed. However, the Personal Ecological Footprint survey data in this study is not a time series data therefore such an economic scheme is not applicable.

Are the seasonal effects in the data small enough to be ignored? Among the survey questions, the two questions on electricity consumption and gas consumption are the ones that are most likely to have significant seasonal differences. As to the electricity consumption,

the main cause of the seasonal difference comes from the 'midnight electric power'[95], which is one of the primary sources for heating in winter in rural districts in South Korea (see Table 12).

Table 12. Electric power consumption in *Buan* district and *Gochang* district in 2009. [from each district office (Buan District Office 2010, Gochang District Office 2010a), calculated by the author]

	***Buan* District**		***Gochang* District**	
Season	Residential Electric Power	Midnight Electric Power	Residential Electric Power	Midnight Electric Power
Monthly Average in Winter (Nov - Apr, MWh)	5,383	N/A	5,547	8,798
Monthly Average in Summer (Jun - Sep, MWh)	5,168	N/A	5,342	2,560
Increase in Winter (%)	4.2	N/A	3.8	243.7

As shown in Table 12, the seasonal effects from 'midnight' electric power consumption is very significant, although not all of it is used for residential purposes. Kerosene, LPG (Liquefied Petroleum Gas), and LNG (Liquefied Natural Gas) consumption also show similar

[95] The midnight electric power consumption is called the 'Night Thermal-storage Power Service (NTPS)' (Cho and Kim 2008). According to Cho & Kim (2008), the NTPS was introduced in South Korea in 1985 to fully utilize the surplus electric power in night hour caused by the establishment of national nuclear power plant system. The Korea Power Corporation provides individual contractors with electric power below the cost for the night hours of 11 p.m. - 9 a.m. The NTPS has rapidly spread since 2000 mainly for residential use (over 80%) and primarily in rural districts. The soar of oil cost since 2005 influenced the increasing demand (National Assembly Budget Office 2009). Compared to other means for heating in winter like kerosene, the use of the NTPS can save about 40% heating cost. In the fieldwork sites, although I did not gather the ratio of the NTPS adopting households to other households, majority of households adopted the facility to use the NTPS.

patterns.[96] As *Buan* district and *Gochang* district show similar annual electric power per capita consumption (1.04 MWh versus 1.07 MWh, see Table 3), it is possible to adjust their consumption at the time of data collections to account for seasonal difference.[97]

4.3.2 Personal Ecological Footprint (PEF) of the two townships.

An independent-samples t-test was conducted to compare Personal Ecological Footprint values in *Gyehwa*-township and those in *Simwon*-township. The result is as follows (see Table 13).

Table 13. Descriptive statistics of the Personal Ecological Footprints of the two townships

Variable	Township	N	Mean	Standard Deviation	Std. Error Mean
PEF (gha)	*Gyehwa*	113	4.1575	1.39334	.13107
	Simwon	117	4.4470	1.62463	.15020

There was not a statistically significant difference in the Personal Ecological Footprint scores for *Gyehwa*-township (M=4.16, sustainable development=1.39) and *Simwon*-township (M=4.45, sustainable development=1.62); t (228) = -1.448, p = 0.15. These results suggest

[96] Refer to North *Jeolla* Province (2008c) and footnote 23.

[97] Seasonal adjustment was conducted as follows. To begin with, the two townships are assumed to have statistically similar variances in terms of electricity and gas consumption. Second, it is determined to adjust electricity and gas consumption data in *Gyehwa*-township (summer data) based on those in *Simwon*-township (winter data) because it is apparent that the consumption in winter is bigger and therefore reflects more about the real energy consumption than that in summer. Third, from the result of regression analysis of the electricity and gas consumption in *Simwon*-township data, the regression equations are derived. Last, the individual's electricity and gas consumption data in *Gyehwa*-township are adjusted by using the regression equations. In this study the seasonally adjusted data are used only to compare the Personal Ecological Footprint means between the two townships and non-adjusted data are used for the analyses within each township.

that, for the first research question, the answer is '**the STRP is neither sustainable enough to make the value of Personal Ecological Footprint in *Gyehwa*-township lower than that of Personal Ecological Footprint in *Simwon*-township, nor is the STRP unsustainable enough to make the value of Personal Ecological Footprint in *Gyehwa*-township higher than that of Personal Ecological Footprint in *Simwon*-township'**. In other words, the current residents of *Gyehwa*-township, even though having gone through with the socio-ecological changes caused by the STRP, do not differ from the residents of *Simwon*-township in terms of Personal Ecological Footprint value compared. This difference indicates that their current consumption patterns are not different from those in *Simwon*-township in terms of sustainable development. Therefore, between the two cases of this study (see Table 5 - Research Outline), Case-I is discarded. The comparison of quality of life between two townships based on the ethnographic data in Section 5 – Case-II - will lead to the determination of which township is more sustainable.

However, even if the Case-I is discarded (no difference in Personal Ecological Footprint values), the three hypotheses from the research question - the influences by migration, age (or generation), and gender on the Personal Ecological Footprint - are worthwhile to be examined. Variables based on the properties of survey participants in *Gyehwa*-township including whether or not an immigrant, younger (60 year or below) or older (61 or over) generation, and gender used in the analysis are displayed in Table 14.[98]

[98] Income is not chosen as a variable. There are two main reasons. First, unlike other variables, to estimate income of the villagers in the rural area is extremely difficult. Their answer for the income-related question is not reliable, even when they answer to the interviewer. I knew they did not want to reveal their sources of income in detail. As to the respondents from whom I could get information about income, I had to do much guesswork to make the data comparative to each other. Second, the existing research shows that income level is the top indicator of the level of Ecological Footprint per capita. For example, Jorgenson and Clark's (2011) analysis of data for 65 countries from 1960 to 2003 shows that GDP per capita is the top indicator of Ecological Footprint per capita (the correlation coefficient is 0.910). Other studies display similar result (e.g., Jorgenson and Clark 2009, Mostafa 2010). However, upon the estimated data from whom I gathered income information

Table 14. Variables used in the analysis for *Gyehwa*-township.[99]

Variable	Description	N	
Migration	Immigrant during the GTRP or after the GTRP	Non-immigrant	44
		Immigrant	69
Generation	Younger generation (60 or below) or older generation (61 or over)[100]	Younger	42
		Older	71
Gender	Male or female	Male	59
		Female	54
Barehand Clam Gatherer	Having been a barehand clam gatherer as the main subsistence means	Yes	16
		No	97
High Status	Being in an esteemed position (ex, village head, pastor)	Yes	28
		No	85
***Gyehwa* Islanders**	Indigenous resident of the old *Gyehwa* Island, which was the name of the island before the GTRP (see footnote 18)	Yes	17
		No	96

Spearman's correlation coefficients are computed to reveal the degree of correlations between Personal Ecological Footprint and the variables in Table 14 as shown in Table 15.

with my guesswork, I conducted statistical analyses to get the degree of correlation between income level and Personal Ecological Footprint. The methods and results are in the footnote for Table 14.

[99] As for using 'income' as a variable, I tried to divide the survey respondents into thirteen degrees from 1 (annual income 0 ~ 9.9 million KW – about 10,000$) to 13 (annual income over 65 million KW – about 65,000$) by 0.5 million KW (5,000$) interval. In other words, 1 = 0 ~ below 10 million KW, 2 = above 10 million KW ~ below 15 million KW, 3 = above 15 million KW ~ below 20 million KW, etc. However, owing to the evasiveness of the respondents and unavoidable estimation work, the data set of income could not be used with other variables in Table 14. Nonetheless, the estimated income data of the two townships show high correlation values with Personal Ecological Footprint values: 0.647 in *Gyehwa*-township (N = 102) and 0.400 in *Simwon*-township (N = 117).

[100] As to the reasons why the age of 60 is chosen as the criterion to divide survey participants into younger and older generation, refer to Table 7 and its footnote in Section 2.3, 'Method' section.

Table 15. Spearman's correlations matrix for the variables of *Gyehwa*-township.

	1	2	3	4	5	6
1. PEF						
2. Migration	.002					
3. Generation	**-.282****	-.164				
4. Gender	**-.368****	.074	.003			
5. Barehand Clam Gatherer	**-.339****	-.248**	.207*	.323**		
6. High Status	.207*	-.004	-.322**	-.385**	-.233*	
7. *Gyehwa* Islanders	-.205*	-.324**	.272**	-.056	.184	-.127

Note: ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

I am not contending that correlation proves causation, but these results can serve as predictor of causation as follows,

> 1) Whether a participant in *Gyehwa*-township is an immigrant or not does not have an influence on Personal Ecological Footprint value.
>
> 2) Younger participants in the study show more unsustainable (high in Personal Ecological Footprint value) consumption pattern than older participants.
>
> 3) Female participants are more sustainable (low in Personal Ecological Footprint value) than male participants.

Although Residents who have subsisted on gathering clams in the mudflats seem to show more sustainable behavior (low in Personal Ecological Footprint value) than non-barehand-gatherers, this may not be warranted. For, they are all females and therefore this seems to be due to the gender effect. Residents who are in more esteemed positions, mostly males, cannot be said to be less sustainable (high in Personal Ecological Footprint value) by

the same reason. *Gyehwa* Islanders, those who occupied the old island (now connected to main land by the GTRP), seem to be more sustainable but it is not clear because of the intervention of generation factor.

How about *Simwon*-township? Using a similar set of variables as in Table 16, except the absence of 'Migration' and '*Gyehwa* Islanders', Spearman's correlation coefficients are computed as shown in Table 17.

Table 16. Variables used in the analysis for *Simwon*-township.

Variable	Description	N	
Generation	Younger generation (60 or below) or older generation (61 or over)	Younger	52
		Older	65
Gender	Male or female	Male	68
		Female	49
Barehand Clam Gatherer	Having been a barehand clam gatherer as the main subsistence means	Yes	16
		No	101
High Status	Being in an esteemed position (ex, village head, pastor)	Yes	10
		No	107

Note: ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 17. Spearman's correlations matrix for the variables of *Simwon*-township.

	1	2	3	4
1. PEF				
2. Generation	-.193*			
3. Gender	**-.471****	.062		
4. Barehand Clam Gatherer	**-.325****	.206*	**.469****	
5. High Status	.138	-.034	-.198*	-.122

Residents in *Simwon*-township also show the same pattern to those in *Gyehwa*-township; female is more sustainable (low in Personal Ecological Footprint value) and the younger generation is less sustainable (high in Personal Ecological Footprint value). Not only the overall scores of Personal Ecological Footprint value of the two townships are statistically not differentiated from each other, the potential factors that influence the Personal Ecological Footprint values reveal similar patterns. In other words, the behavior of people in *Gyehwa*-township reflects not so much the impacts by the STRP as the common factors which *Gyehwa*-township and *Simwon*-township, or broadly speaking, *Buan* district and *Gochang* district share. Or is it because of much broader factors such as country level or global level relations? Or, the non-difference (statistically) of Personal Ecological Footprint values between the two townships is mere coincidence and the quality of life or ethnographic realities of people in the two townships are distinguished enough to judge that one township is more sustainable than the other? That is the subject of the next section.

4.4 What Were the Personal Ecological Footprint Values of the Two Townships in 1990?

There is no way to deny the possibility that the Personal Ecological Footprint Values of the two townships before the STRP were different. Of course, in that case, all the evidences that I provided in the previous section to bolster my argument that the Personal Ecological Footprint Values of the two townships in 1989 or 1990 were the same have to be discarded. Let's assume that this is the case, then, how can we interpret the non-difference of the Personal Ecological Footprint values of the current residents in the two townships as shown in this section?

One way to deal with this possibility is a small thought experiment. Out of sixteen Personal Ecological Footprint test provided by Global Footprint Network (GFN) (2009), South Africa is most comparable to South Korea around 1990 - Ecological Footprint per capita of 2.3 gha compared to 2.4 ~ 2.7 in South Korea, 1989 - 1990.[101] There are four categories of questions for Personal Ecological Footprint test of South Africa - Food, Goods, Shelter, and Mobility. As discussed in '**Ecological Footprint (EF) and the two townships in 1989**' section, the possibility of more inequality in the categories of food, goods, or mobility around 1990 than in 2009 - 2011 is low.[102] As to shelter category, the questions are the number of persons per household, the type of home, spending on electricity, and energy for heating/cooking. Among these, the energy for heating/cooking has the possibility of significant variance across the townships in 1990. Consulting Table 11, the pre-modern way

[101] The only reason why the case of South Africa is used here is that the country is one of the 16 countries available in the Global Footprint Network (GFN) for calculating Personal Ecological Footprint and the current Personal Ecological Footprint value of South Africa is the nearest among the 16 countries to that of South Korea in 1990.

[102] Refer to Figure 15, Table 9 and 11. Also refer to footnote 89.

of heating facility (traditional fuel hole system - using firewood for heating) accounted for 17.7% (4,509 households) in *Buan* district and 14.3% (3,742 households) in *Gochang* district. If those households had been fairly evenly distributed in the two districts, about 3.4% difference between two districts would have influenced the Personal Ecological Footprint values insignificantly.

The Korean government changed its policy to invest in rural development about 1990. In the 1980s, the so-called 'Integrated Rural Development (IRD)' targeted 'districts' (Choi, Kim, and Song 1992). This means that, the government planned to invest in center of a district (semi-city area such as the *Buan*-Eup or *Buan*-County which functions as an administrative, industrial, commercial, and cultural center in the district) and to relate its development effects to the hinterland of the district center (such as *Gyehwa*-township). This IRD projects were generally regarded as failure due to lack of funding and local autonomy (Seo 2004). In 1990, new scheme for rural development - 'Living Environment Improvement (LEI)' or 'Rural Settlement Development (RSD)'- was introduced (Oh 1992, Seo 2004). This new initiative targeted 'townships', which means that, if selected as an investment target, a township could get a concentrated funding and support from (local) government to improve their living environment such as basic infrastructure (tap water system or sewage system), housing improvement and renovating their cooking and heating facilities. This township-targeted rural development plans were part of a huge framework aimed at supporting the comprehensive rural development in 1992 - 1998 (42 trillion KW – 42 billion $) and for specifically improving living environment, 366.4 billion KW (366 million $) was spent in 1992 - 1995 (Ministry for Agriculture, Forestry, and Fisheries (MAF, 농림부) 1997).

Gyehwa-township and *Simwon*-township must have been impacted by LEI or RSD

projects. Informants remembered that they could get funding of good conditions to renovate their houses in the 1990s. For example, YoungSoo Cho, a resident in *Gyehwa*-township got 20 million KW (20,000 $) loan to rebuild his house which was equipped with modern type of kitchen (the use of gas for cooking) and heating facility (piped boiler system). The condition of the loan was favorable to loaners and he was still paying annually in 2010, which was not much a burden for him. If the Personal Ecological Footprint values of the two townships around 1990 had been significantly different, it would have been owing to the time gap of governmental investment plans between townships. However, throughout the 1990s, most of the rural area in South Korea transformed themselves almost completely in terms of housing and cooking or heating methods. Around 2005, traditional fuel hole type heating facilities almost completely disappeared (less than one percent) and modern type of kitchen occupied more than 70% in *Buan* or *Gochang* district (National Statistical Office 1996).

In sum, it is very difficult to portray significantly different township living conditions before 1991 in the two townships in terms of Personal Ecological Footprint. An interesting fact is that the similarity or difference of Personal Ecological Footprint values in the two townships has always tied to the national schemes of rural development. Nevertheless, another national development project - the STRP did not seem to impact the Personal Ecological Footprint value in *Gyehwa*-township. Why? This question is addressed in the following sections.

5. QUALITY OF LIFE - CULTURALLY WOVEN ASSETS FOR INDIVIDUALS

5.1 Two Families in Two Townships

In Section 4, it was shown that the two townships not only had similar impacts on the eco-capacity of the earth around 1990, but they are still showing similar consumption rates in 2010. The question in this study now moves to the next level - how about their quality of life, does quality of life of the two townships also reveal no discrepancy? Recent report of social statistics survey in the province (Jeollabuk-do (North Jeolla Province) 2008b) says that people in this region evaluate subjectively their happiness as 6.44 on the basis of 10 points. Township areas (rural areas like the two townships) show a little less than the average. These days, social surveys ask dozens of questions, and compile long reports based on the analysis of these statistics. It seems that, quality of life questioning has become part of people's daily life.

However, what do these quality of life questions tell us about sustainable development? If sustainable development is defined as the 'decrease of Personal Ecological Footprint while improving or maintaining quality of life', what should be asked as quality of life questions? In this section, based on the discussion in Section 3.6 - 'a Set of Sustainable Development Study Tools', quality of life questions are dealt with as follows. First, considering that resources (natural or other type) are meaningful to individuals as 'assets', what kind of assets people muster to support their living and how they are accessed will be analyzed. Second, I will cover the issue of how the commons (common-pooled resources, CPRs) in the two townships are managed by and for the individuals. In this case, the commons are another type

of assets to individuals. Third, one of the essential factors for livelihood resilience of individuals - the relational aspects of individuals to themselves, family, community, and (local and central) government - will be discussed. Last, the surroundings of people or environmental health of the two townships will be briefly covered.

I will begin with a family in each township. Although the two families are not comparable in terms of Personal Ecological Footprint but rather contrary, they are not so deviated from the ordinary households in the two townships. Together, it seems that they can cover most of aspects of quality of life questions outlined above.[103] YoungSoo Cho, a 80 year old man is an immigrant to *Gyehwa*-township. He led his family - his wife, two sons and a daughter - to *Gyehwa*-Island (*Gyehwa-ri* or *Gyehwa* village)[104] in the early 1970s. He moved within the island area several times and settled in the current location in the early 1980s. In 1995, he built his current house with the help of a loan from a governmental program[105] The home has three rooms, one kitchen (gas cooking facility), one bathroom and piped boiler heating. Originally he was from the capital city of North *Jeolla* province - Jeonju city. He visits Jeonju city almost once a week to get around with his hometown friends. His wife, 77 year old, is an ordinary housewife. Mr. and Mrs. Cho's children, all married, went to other regions - Taejeon city, Kimje city, and *Buan*-Eup. Mr. Kim has a license of realtor but it seems that it is not the mainstay for his subsistence.

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[103] The choice of the two families, whose ages are over 65, can be justified by the fact that the rural area in South Korea is a super-aged society. For example, in *Gyehwa*-township and *Simwon*-township, the elderly (65 year or older) occupy more than 30 percent of the total population. In addition, considering that the informants who experienced both the GTRP and the STRP are needed, the choice of the two families among the elderly is preferable.

[104] '*ri*' is the minimum unit of admistrative division. '*Ri*' is usually composed of several villages. The population of a '*ri*' differs significantly but about 100 at average. Refer to footnote 1.

[105] Living Environment Improvement (LEI). Refer to the Chapter 4. Moreover, as a realtor, he seemed to know that building a new house next to the main road of the village (the main road of *Gyehwa*-Island) would be better in terms of the prospect of land value in the future.

SungKwang Choi, a 77 year old man, is a native in *Simwon*-township. His forefathers had lived in the area for generations. From his parents, he inherited relatively wealthy assets (dry and rice paddy)[106]. He experienced the life of Seoul - the capital city of South Korea - in his twenties and thirties but he decided to come back hometown when he was about forty - in the early 1970s. He runs short-necked clam (*Bajirak* in Korean) breeding fields and also owns several hectare rice fields. Mr. and Mrs. Choi (75) have five sons and one daughter. Except the last son, the other children all got married. Two sons stay near in the same township and others live in Seoul and Jeonju city.

From the next section, centering around the two families' life style, I will describe the answers for the quality of life questions in the two townships - assets for individuals, the commons, the collective institutions and social safety net, and the environment.

5.2 Assets - Individual and the Commons

5.2.1 Rice field and land.

Mr. Choi (SungKwang Choi) inherited rice paddy and dry field, which is larger than the average farming area per farming household in *Gochang* district (2.38 ha)[107]. He seems to own more than ten hectare rice paddy field. Traditionally and still in rural communities in Korea, owning rice field is regarded as one of the best fortune of individuals. Since the '*SeGyehwa* (Globalization)' policy was adopted as the overarching policy of the government in 1992, agriculture has been the main target of subsidies to secure farmers' income level.

[106] He remembers that his parents kept farm servants called '*Moe-Seum*' even until the 1960s. They were legally not servants but traditionally *Moe-Seums* were hired for their lifetime, living near their master's house.

[107] *Gochang* district office (2010a).

Rice paddy is in the center of such subsidies.

For example, farmers who own rice field can cultivate themselves or lend to private farmers or to the public Farmland Bank run by the Korean Rural Community Corporation (KRC)(Korean Rural Community Corporation (KRC) 2005). For the production of rice, if the market price at harvest period is lower than the target price set by the government, the government basically compensates at least 85% of the difference to farmers, although the details are complicated[108]. However, the biggest subsidy for farming is not the direct income aid by compensating the difference below market price. Farming and fisheries receive huge subsidy for their use of fuels. In South Korea, various taxes comprise more than half of the oil price. For the purpose of farming and fisheries, the government exempts those taxes. According to Yoon's (2007) calculation, the amount of subsidy for farmers by tax-free fuels exceeds that of Rice Direct Payment Program (RDPP) by 24% in 2005, reaching total 1.25 trillion KW (1.2 billion $).

Most residents over 60 years old in *Simwon*-township who own rice field now lend their land to others - usually the younger generations in the villages. If a family of two - husband and wife over 60 - could own average area of rice field (2.38 ha), they would lead a decent life in the village[109]. In sum, rice field is the single most important asset for individuals. Mr. Choi (SungKwang Choi) could invest his capital - the accumulated capital from his rice field - in purchasing and expanding his short-necked clam breeding field in the

[108] Before 2005, the government aimed at sustaining the market price itself by purchasing rice. However, along the development of global agricultural trade agreement such as Doha Development Agenda (DDA), the government changed its policy towards direct income aid program. 'Rice Direct Payment Program (RDPP)' is the main policy for rice farmers. Based on the documents on RDPP (Cho and Ahn 2010, Lee and Kim 2009, Lee and Sa 2011), the author's calculation shows that farmers can receive about 8 ~ 10 million KW (8,000 ~ 10,000 $) per hectare per year.

[109] This author's calculation. (8 - 10 million KW / ha) x 2.33 ha x 50% (lending) = about 10 million KW (10,000$) per year.

tideland. Nowadays, his income from aquaculture is much larger than that from farming. It seems that he earns more than 200 million KW (200,000$) per year. Of course, he is an exceptional case. According to JaeHyung Lee, who is a resident in *Gyehwa*-township, such large scale farmers or fishermen are one out of ten in his township. My estimate about *Simwon*-township is not different from his.[110]

On the other hand, Mr. Cho (YoungSoo Cho) in *Gyehwa-ri* is relatively poor. He owns only one hectare, which he lends. Considering that the average area of farming in *Buan* district is 2.37 ha, his family is in the lowest quintile. Therefore, Mr. Cho cannot subsist on farming and from my calculation based on their spending, the rice field provides only half of the necessary income.[111] Since the global financial crisis in 2008, his irregular earnings as a realtor have almost stopped. In any way, although it is not enough for the whole subsistence, the existence and utility of the rice filed means an essential asset for Mr. Cho. In terms of accounting, despite annual variability, one hectare rice field can be regarded as about 400,000 KW (400 $) of cash flow a month.

Although not having utility for subsistence, the land for housing plays a significant role as an individual asset. For instance, from the expectation of development by the STRP, the trade value of the land in *Gyehwa*-township is higher than that in *Simwon*-township. If the land is adjacent to the main road of the *Gyehwa-ri* village, the market value of the land per '*pyung* (about 3.3 m^2) is about 400,000 ~ 500,000 KW (400 ~ 500$) whereas the land adjacent to the main road in *Simwon*-township is about 100,000 KW (100$). This boom of

[110] Among the participants for the Personal Ecological Footprint surveys, the number of villagers whose annual income is above 50 million KW (50,000$) in *Gyehwa*-township is 13 (out of n = 103) while that of *Simwon*-township is 11 (out of n = 103).

[111] They spend 0.5 ~ 1 million KW (500 ~ 1,000$) per month. Utilities - 40,000, communications (TEL) - 40,000, transportation - 100,000, food - 100,000, clinic & pharmacy - 150,000, and other costs. Also Mr. Cho has to pay the principal & interest of the loan for building his house - about 1 million per year. Calculated based on information from four month staying with his family.

speculation in real estate in *Gyehwa*-township was a typical syndrome of most development projects in South Korea for the last half century. Unfortunately, the profit of the boom mostly went to outsiders.

Recently, there was an introduction of a bridge construction project, the '*Bu-Chang-Dae-kyo*'[112], which will connect *Buan* district and *Gochang* district across the *Gomso*-man (*Gomso*-bay) that contains the tideland area of *Simwon*-township. Due to the expectation of development projects, the asking price of the land adjacent to the main road of *Simwon*-township rose to 300,000 ~ 500,000 KW (300 ~ 500$). Nobody knows when the bridge actually will be built but only the announcement of it raised the land value of the region.

In summary, rice field and lot area are the primary type of asset for individuals in the two townships. However, except for a small minority of households, these assets do not provide enough income. In addition, as shown above, the cash flow of rice field is dependent on the heavy subsidies for rural area by the government. At first sight, the broad plains of *Gyehwa*-township and dry/rice fields optimized to its terrain in *Simwon*-township can be seen as the bounty of natural asset. In reality, most of their values, on which villagers are mainly dependent, are determined by the political economy such as the relations between rural communities and urban power holders - for the measure of tax-free fuels, or between global players and South Korea as an export-oriented country which has to negotiate with its trade partners about agricultural subsidies. As to the two townships, considering the fact that the portion of external effects such as fuel subsidy or direct income aid program is overwhelming, the small differences between the two townships such as average farming area per household,

[112] The name of the bridge is a combination of the two districts: Bu (from *Buan* district) + Chang (from Go'chang' district). Basic design of the bridge was already completed in 2005 but the cost-benefit analysis didn't show good result enough to build the bridge. However, recently, the public opinion in the region has risen in favor of constructing the bridge for the supplementary development in the areas neighboring the STRP (Ko 2011).

though they can impact individual household very differently, seems to be relatively small. As an aspect of quality of life, rice field and other real estate are not significantly differentiated between the two townships.

5.2.2 Hidden but useful asset - vegetable gardens

People in *Gyehwa*-township usually get up very early. In summer, around five or so, most of them already are up and go outside. They go to their vegetable gardens first. Weeding, thinning, or nipping, they go around every nook and corner of the garden (see Figure 20).

Figure 20. A typical vegetable garden. Residents grow lettuce, cabbage, turnip, pepper, cucumber, sweet potato, mulberry, green onion, sesame, perilla, persimmon tree, apple tree, chestnut tree, etc.

Mr. Cho is not an exception. The Cho's have two sites of vegetable gardens. One is

inside their housing lot and the other is in the way towards the hill side of the *Gyehwa* Mountain. The one at home is the size about 100 *pyung* (330 m^2) and the other is about 50 *pyung* (170 m^2). What is interesting is the fact that, the second garden (the smaller one) is located on land that they do not own. He told me that the land belongs to an absentee landlord, and that many vegetable gardens in *Gyehwa*-township are located on such lands.[113] The circumstances are similar in *Simwon*-township. Mr. Choi and his wife have a garden in their lot - about 50 *pyung* (170 m^2). Besides, they also grow some plants in the plot of the house adjacent to theirs. The house is deserted and vacant. Officially, about 10% of houses in both districts are deserted[114]. However, several villages have much more deserted houses - for instance, about 20% in *GyeSang-ri* (a small village within the *Gyehwa*-Island area). The reason is obvious; people emigrate or die, and no one reoccupies. The human-empty area becomes now area of full of vegetables. I have never seen Mrs. Cho purchase vegetables. Except extreme heat period of summer and winter, the two gardens provide them with enough quantity and quality of vegetables.

Vegetable gardens exist everywhere: small plot next to a bus stop, narrow but long are between two demarcated rice fields, or beside the roads. According to Korea National Statistical Office (2008), a Korean household spend 37,000 KW (37$) monthly on vegetables and seaweeds in 2008. Presumably, almost all the households in *Gyehwa*-township and *Simwon*-township can be said to benefit by their vegetable gardens more than 37,000 KW (37$) per month, considering the quality of their products. They are hardly noticeable in terms of asset but vegetable gardens are an essential component of resilient livelihood of the

[113] They do not pay for using the land of the absentee landlord. The Chois do not, either. In the villagers' mind of the two townships, the appropriation of the empty land, regardless of the ownership, as a small vegetable garden seems a natural right of the neighboring villagers.

[114] From each district office (Buan District Office 2010, Gochang District Office 2010a).

two township residents.

5.2.3 Mudflats - the commons

After the mudflats were almost wiped away by the STRP (April 2006), the memory of the mudflats as the common in *Gyehwa*-township is rapidly disappearing. In the past, how did people in the village manage this common resource? Although the size, the species of clams and fish, the ways how to organize breeding and catching sites must be different between the old *Gyehwa*-township mudflats and the current *Simwon*-township mudflats, the distributional characteristics of the benefits from the commons (mudflats) can be reasonably analogized from *Simwon*-township for *Gyehwa*-township.[115]

There are 128 fishery licensees in Simwon-township in 2010 (Gochang District Office 2010b). Among them, 97 represent breeding fields demarcated as maritime fisheries (remaining 31 are inland fisheries) in Figure 21. Each breeding field occupies an area of about 5 ~ 10 hectare. In case of Simwon-township, 70 fields breed short-necked clams (Tapes philippinarum). Simwon-township is famous for its production of short-necked clams.

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[115] Although we call the intertidal areas in the western and southern coast in South Korea by using the same name – the mudflats (salt marsh or tideland), the flora and fauna of each area are different according to their origin (whether they develop in estuary of big river or in a bay without big rivers), composition ratio of sand and silt, latitude (water temperature), and human intervention (breeding species for aquaculture, composition change through reclamation, influx of pollutants from the hinterland, or water temperature rise from the nuclear power plant). The STRP area is a typical mudflats developed in the estuaries of two big rivers (*Mankyung* river and *Dongjin* river), which gave the villagers in Gyehwa-township '*Baekhaap*' (Venerid Clams, Mollusca, Bivalvia, see Figure 2) as commercially important species thriving well in sand-dominating tideland. However, after the dyke construction of the STRP began, the number of caught Venerid clams remarkably decreased and it seems that they completely disappeared after the completion of the dykes in 2006. The mudflats in *Gomso*-bay (including the mudflats in *Simwon*-township) develops in a bay (*Gomso*-bay) without big rivers (there are several streams running into the bay), which forms broad area of mudflats composed of mainly silt. The mudflats in *Simwon*-township are composed of various ratio of sand and silt from location to location but the economically important species in this area are *Bajirak* (short-necked clam, *Ruditapes philippinarum*) or *Gamurak* (Cyclina sinensis) As to the floral, faunal, and ecological research, refer to The Ministry of Land (2004), The Ministry of Land (2001).

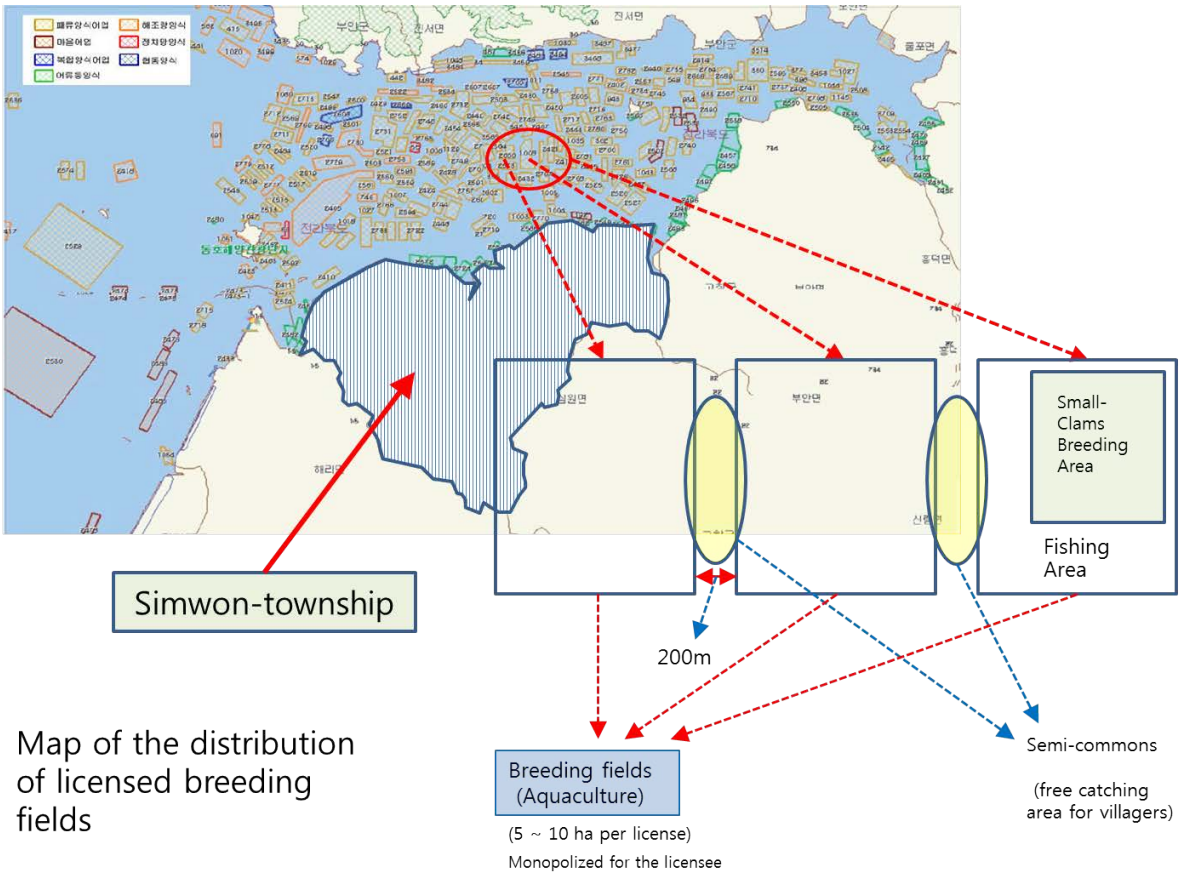

Figure 21. Licensed breeding fields and the commons - mudflats in *Simwon*-township.

Especially, *Hajeon-ri* (*Hajeon* Village) supplies about 10,000 tons annually, 25% of Korean demands in short-necked clams. Mr. Choi (SungKwang Choi) remembers that he was the second licensee in the whole *Gochang* district when he registered as an aquaculture breeder of clams in 1972. Around 1990, almost all the tideland area in the *Gomso*-man (*Gomso* bay, the bay area in Figure 21) was occupied by licensees.

However, Mr. Choi says that only a few village members had enough capital to invest in such new business in the 1970s. As a result, most of the licensed fields are occupied by outsiders, although the outsiders registered as a member of the local cooperatives. Residents

in *Simwon*-township can still access the resources in the mudflats, however. Shown in Figure 21, village people can catch clams in the area between licensed breeding fields. The owners of the licensed fields are aware of the fuzziness of such area but they allow people to catch clams if they do not intrude into too deep within their breeding field. Still, even such areas between licensed fields are not open to everyone. Customarily, only those members whose village faces the mudflat can access such semi-commons. YeonSeon Kang, a barehand gatherer (58 year old female) who has experienced more than 25 year in mudflats of *Simwon*-township, remembers such a case as non-villagers engaging in catching clams and says, "after *Saemangeum* (dykes) blocked (the tide), (outside gatherers) began to come. A few times, (we) endured. But, one day, we (including me) couldn't. (We) Faced them and told them go away. Here is our villagers'. They went to the *DongHo-ri* direction". I doubt that the outsiders (mainly those who caught clams in the STRP area) succeeded in catching clams in *DonHo-ri* (within *Haeri*-township neighboring *Simwon*-township) because the place must have been saturated already.

This strange cohabitation of private ownership and the commons ownership, however, cannot be generalized to other fisheries or aquaculture breeding areas in South Korea. The dynamics of managing the commons (the fishing ground) revolves on three institutions - the village community, the village fishing societies (the Eo-Chon-Gye, 魚村契), and fisheries cooperative.[116] Even the characteristics of the three institutions significantly vary according to time and place and there are no accurate definitions. Nevertheless, roughly speaking, first, the village community is based not on industry (like farming or fisheries) but on residents

[116] Without the interruption by the government, the differences between the fishing village society and the fisheries cooperative would not have emerged in the first place. In 1953, the law for the fisheries cooperative was enacted and the legislation to establish the village fishing societies around the country was introduced in 1962. The latter was enacted for improving the status of the petty fishermen in villages but brought about complicated consequences (Park 2001).

who live in the village. Second, the village fishing societies (the Eo-Chon-Gye) is based on the people who have the communal right to access the resources on the fishing ground. Last, the fisheries cooperative is based on the economic (financial) functions such as giving credit or selling the products to the market. Of course, individuals as a citizen also can do fisheries without participating any of the three institutions.

As for the fishing ground in *Simwon*-township, individuals occupy 75% of breeding field area and the village fishing societies (the Eo-Chon-Gye) have the remaining 25% (Gochang District Office 2010b). Both individuals and the village fishing societies can use the distribution channels of the fisheries cooperative to sell their products or can sell themselves. Regardless of whether being a member of the village fishing societies or the fisheries cooperative, the village members whose villages[117] are adjacent to the mudflats can access the fuzzy area between the licensed breeding fields in Figure 21. Though not elaborated by a legislation or law, they seem to have the right as a member of the village community.[118] Dynamics between the three institutions and the characteristics of natural resources may determine the way how the commons is governed.[119]

Except the entrepreneurial owners of the breeding field, how much does the existence of mudflats benefit the livelihood of ordinary individuals in *Simwon*-township? Mudflat labors are composed of six steps: 1) purchasing or collecting fry clams, 2) safely planting fry clams into the mudflats, 3) growing clams for two to three years, 4) catching grown clams, 5)

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[117] Hypothetically speaking, if a person live in a village whose boundary is not adjacent to coastline, then even if his or her house is nearer to the tideland, the person cannot access to the fuzzy area. However, he or she may be able to work as a laborer in the mudflats hired by the owners of the breeding fields.

[118] Again this means that, even if a person is not a member of either village fishing societies or the fisheries cooperative, as long as he or she lives in the village whose boarder is adjacent to coastline and is acknowledged as a member of the community by other villagers, he or she has a right to access the fuzzy area.

[119] As to the various dynamics between the three institutions and natural resources in Korean fisheries, refer to Kim (2010), Choi (2007), Choi et al (2006).

shelling, and 6) selling.[120] Among these steps, ordinary village people can take part in step 4 and 5.[121] Though some male workers go for the step 4, most of workers are female. Such jobs require work for eight months of the year, with only break during the winter season. The peak of step 4 is in May and June and the peak of step 5 is from May to August.[122] In the past, the fourth step required the most labor but after the mechanization described in Section 3, the amount of labor required for this step decreased. However, each breeding field still needs four or five workers per day to complete this task. The work in step 4 usually give a worker 30,000 ~ 50,000 KW (30 ~ 50$) a day.[123] The fifth step, shelling, demands steady labor. From April to November, at least two to four, and up to ten women gather together in one of their household yard to shell the clams. Such scenes can be witnessed almost every four or five houses along the coastline villages in the peak season. Most of them, through twenty to thirty year experience, show high productivity. A bag of shelled clams, weighing 20 kg, takes about three hours to be shelled by a skillful worker. A skillful laborer usually can shell three 20 kg bags of clams, which gives her about 40,000 KW (40$) earning a day. In the peak months (May to August), they shell clams 20 ~ 25 days monthly, earning 3 ~ 4 million

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[120] During the growing period, there is no need of much work. Nonetheless, the owners of the breeding field watch the status of the clam growth whenever they go out to the field. If the fry clams does not seem to take root in the mudflats or die, they have to be discovered and replaced as soon as possible.

[121] Only the owners of the breeding fields are involved step 1 and 2. They are almost men. The workers in the remaining steps are almost females, though some male workers participate in step 4. In step 5, it seems that only female workers participate. Therefore, it can be said that mainly women do more time-consuming and labor-intensive part of the whole steps. After the five steps, the owners collect the shelled (and unshelled) clams and sell them to the fisheries cooperative or directly to the middlemen who connect the owners and the large fisheries wholesale markets in large cities such as the *Garak* Fisheries Wholesale Market or the *Noryanjin* Fisheries Wholesale Market in Seoul.

[122] The entrepreneurial individuals - some own the breeding fields and others do not - bring short-neck clams to local villages from outside such as the STRP area and even from North Korea. They have local workers shell the clams and sell the shelled clams. The shelled clams can call much higher price, which, ironically, makes the region import a large quantity of short-neck clams, too.

[123] Although the pay for labor counts by day, the actual working hours are about four hours. This is due to the fact that works are possible only during the ebb tide.

KW (3,000 ~ 4,000$) in total. During the remaining months (April and September to November), the amount of work decreases by half, but they may still earn significant amount of cash.

As a result of existence of such jobs in step 4 or 5, female residents in coastline villages like *Hajeon-ri*, *Mandol-ri, Yonggi-ri*, and *Doer-ri* can earn millions KW (thousands $) a year, depending on individual's skill and health status.[124] As discussed in Section 3 on the commons for sustainable development, natural assets are crucial for sustainable livelihood of local people who can access them. How can we imagine the lives of such females in coastline villages of *Simwon*-township as deprived of mudflat access?[125] This seemingly impossible imagination happened in *Gyehwa*-township due to the STRP. Recollections of female interviewees in *Gyehwa*-township who experienced barehand clam gathering in mudflats are full of such stories as the description above about females in *Simwon*-township - independent working and decent earning by women.

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[124] A skilled woman can earn 4.5 ~ 6 million KW (4,500 ~ 6,000$) per year through the 'shelling' labor, eight to ten hours a day and 20 ~ 25 days a month in peak season (May to August), and about ten to fifteen days a month in the remaining months (April and September to November) according to the above description. In 2010, the GDP per capita in South Korea is 20,759 $ and the disposable income per capita is 11,670 $. The GRDP (Gross Regional Domestic Production) in North Jeolla province in 2010 is 17.518 $ and the disposable income per capita is 10,872 $ (National Statistical Office 2011a). The earnings from the labor in the mudflats or from shelling are given by cash directly to the laborers (without tax) and therefore should be regarded not so much as part of GDP per capita or GNI per capita but as part of disposable income. Therefore, the annual earning of a skilled women (4,500 ~ 6,000 $) may be comparable to half of the annual disposable income (10,872 $) of the average individual in North Jeolla province. This is still considerable amount. For, the husbands of those women usually participate in their own fishing or farming activities as a main means of living of the household. Although their income in terms of household is lower than the average in South Korea, as an independent cash earner, those women in the mudflat work and shelling seem to have stronger voice in their household affairs.

[125] In the villages which border on the coastline, majority of women seem to participate at least partially in the works in the mudflats or in shelling. For instance, in one of such village (*Hajeon*-ri), out of fourteen female interviewees, ten take part in shelling or going to the mudflats. In the past (before the mechanic method was introduced to gather the clams), women in the villages which did not border on the coastline were able to have the opportunity to participate in such jobs. However, nowadays, they seem to lose almost all of those income-earning chances.

> I became a widow at 39 (years old). I brought up seven children alone. I went to the mudflat for forty years. I went everyday, fifteen days a month, catching clams. I went to the Yangji-pier. I was aboard in a boat and went to the sea. To earn 7,000 - 10,000 KW (7 ~ 10$) a day. My children live well. I educated them all, (owing to) the sea. The mudflat. What else can a widow do? (HoKeum Lee, 77).
>
> (In the past,) I went out to the sea and there I lived. (Now, if I could) do, though too old, I would go out. … Now nothing to do, idling like this. … Once going out, 40,000 ~ 50,000 KW (40 ~ 50$), even if not catching much. … Also went out in winter, as long as (the mudflats are) not freezing (SooJin Kim, 74).
>
> Now there is nothing to eat. (The dykes) blocked here, (therefore) the mudflats went rotten. … I lived a very suffering life. Humans are not different from animals. … That's, 8 million KW (8,000$)? (I) received the compensation. … When did the money fly away? Almost as soon as (I received it). Our living (becomes) only hardships (HyunJeong Park, 75).

As to the living on mudflats, there exist many studies. For example, Hahm (2004, 2010) reports the economic independence of females, leading to the relative equality of gender and the sufferings and aftermath of them after the dykes began to decrease the tidal flows. Conflicts among the coastal villages, disappearance of traditional culture of mutual aid, and the death of (unconscious) ecological knowledge and behaviors are the examples of such sufferings (Hahm 2010, Jeon 2004, Park 2003, Pulkkod Pyunghwa Yeonkuso (풀꽃평화연구소) 2004, Yoon 2004).[126]

There is no doubt that the residents in *Gyehwa*-township, at least the residents in the

[126] As for men, the situation was different. Men usually were engaged in farming or fishery by fishing boats or both. Some husbands helped their wives by dragging the cart or barrow to load the gathered clams (H.-h. 함. Hahm 2004). Since the dykes of the STRP completed in 2006, though the barehand clam gathering became impossible, the fishing boats have continuously operated inside the STRP area (in the planned future freshwater lake). This is because the government still allows sea water to flow in and out of the dykes to maintain the water quality of the planned lake. In other words, the fishermen in the STRP area seem to continue run their fishing activities until the actual reclamation begins, is spite of the unpredictable catch expectation.

coastal villages like people in the old *Gyehwa*-Island, could get the same benefits as or more benefits than those in *Simwon*-township before the construction of the STRP. Considering the fact that, an ordinary woman in the coastal village in *Simwon*-township can earn several million KW (several thousand $) a year from their mudflats, it is certain that the significant portion of the residents in *Gyehwa*-township lacks cash flow that they enjoyed in the past. The loss of natural asset - the mudflats - must be detrimental to at least hundreds of women and therefore their households. From this, can we conclude that, the quality of life in *Gyehwa*-township is significantly lower than that in *Simwon*-township? Interestingly enough, I argue that the answer is no, which will be elaborated in the social safety net description, later in this section. Nevertheless, in the meanwhile, if we could calculate the quality of life as a point, it seems that the point of quality of life in *Simwon*-township would be fairly higher than that in *Gyehwa*-township.

5.2.4 Other type of natural asset - eco-tourism

Since the mid-2000, a type of eco-tourism, '*Gae-Ppul-Che-Hum* (experiencing mudflats)' has become popular. *Hajeon-ri* (*Hajeon* village) is one of the first villages who began such program. People, usually families accompanying children, are guided to a limited area (about three hectare out of the 35 hectare common fishing/breeding ground) of mudflats, catching clams and experiencing tideland eco-system for several hours. More than 30,000 - 40,000 tourists visit the program annually, which brings about 100 million KW (100,000$) revenue.[127] *Hajeon*-ri began the eco-tourism program in 2004 and two years later,

[127] The program is open from April to November. I couldn't witness the real program, but got information from villagers in *Hajeon-ri* and a village head.

neighboring *Mandol-ri* embarked upon a similar program (see Figure 22).[128]

Figure 22. Two '*Gae-Ppul-Che-Hum* (experiencing mudflats)' sites in *Simwon*-township - *Hajeon-ri* mudflat experiencing center and *Mandol-ri* mudflat experiencing center. [Map from Google Map™, except one in the center from *Mandol-ri* mudflat experiencing center (2010)), photos taken by the author].

Eco-tourism is a well-known type of practice for sustainable development. It is said to achieve both eco-system conservation and improvement of local people's sustainable livelihood.[129] For example, Mbaiwa and Stronza (2010) show a successful eco-tourism site

[128] Both villages could get fund to implement the facilities for the 'experiencing mudflats' from local government - *Gochang* district. Each implementation needed about 500 million KW (0.5 million $) and 95% of it came from the governmental aid (Gochang District Office 2010b).

[129] See Chapter 3, 'anthropological studies on sustainable development'.

in terms of sustainable development from the Okavango Delta, Botswana. In one of the villages of their study, Mababe, almost every household gets a job from the eco-tourism program (the Community-Based Natural Resource Management) and also receives various types of financial and social benefits. What is interesting to me related with the two mudflat experiencing centers in *Simwon*-township is the relative power of the financial benefit. According to Mbaiwa and Stronza (2010), the village Mababe (a small community of population 290) earned $ 200,000 of revenue in 2007. In sum, this amounts to about $ 700 or so per person annually, providing all the benefits as well as jobs!

However, as to the *Hajeon*-ri mudflat experiencing center, although the annual revenue reaches about $100,000[130], that amount of revenue can hardly support more than the annual spending of four households, let alone provide jobs to every household. It is true that the running mudflat experiencing center gives incentives for village people to manage their common fishing/breeding ground more sustainably. However, in terms of the effectiveness of eco-tourism for both conserving eco-systems and providing sustainable livelihood to local community, the contrast between an unindustrialized country like Botswana and an industrialized country like South Korea is stark. In other words, in a society like South Korea, where the high level of standard of consumption is already a norm to everyone's decent living, the effectiveness of eco-tourism can only be limited. In case of *Gyehwa*-township, considering the fact that it had the broadest mudflat area in South Korea before the STRP, it could have boasted much larger and sustainable eco-tourism site by utilizing their mudflats. Still, as discussed in this section, the beneficiaries of such eco-tourism scheme would have been small compared to the total population in the region. Nevertheless, the local villagers in

[130] $ 1 dollar is about 1,000 KW.

Gyehwa-Island are trying to implement a similar, eco-friendly development plan for their village.

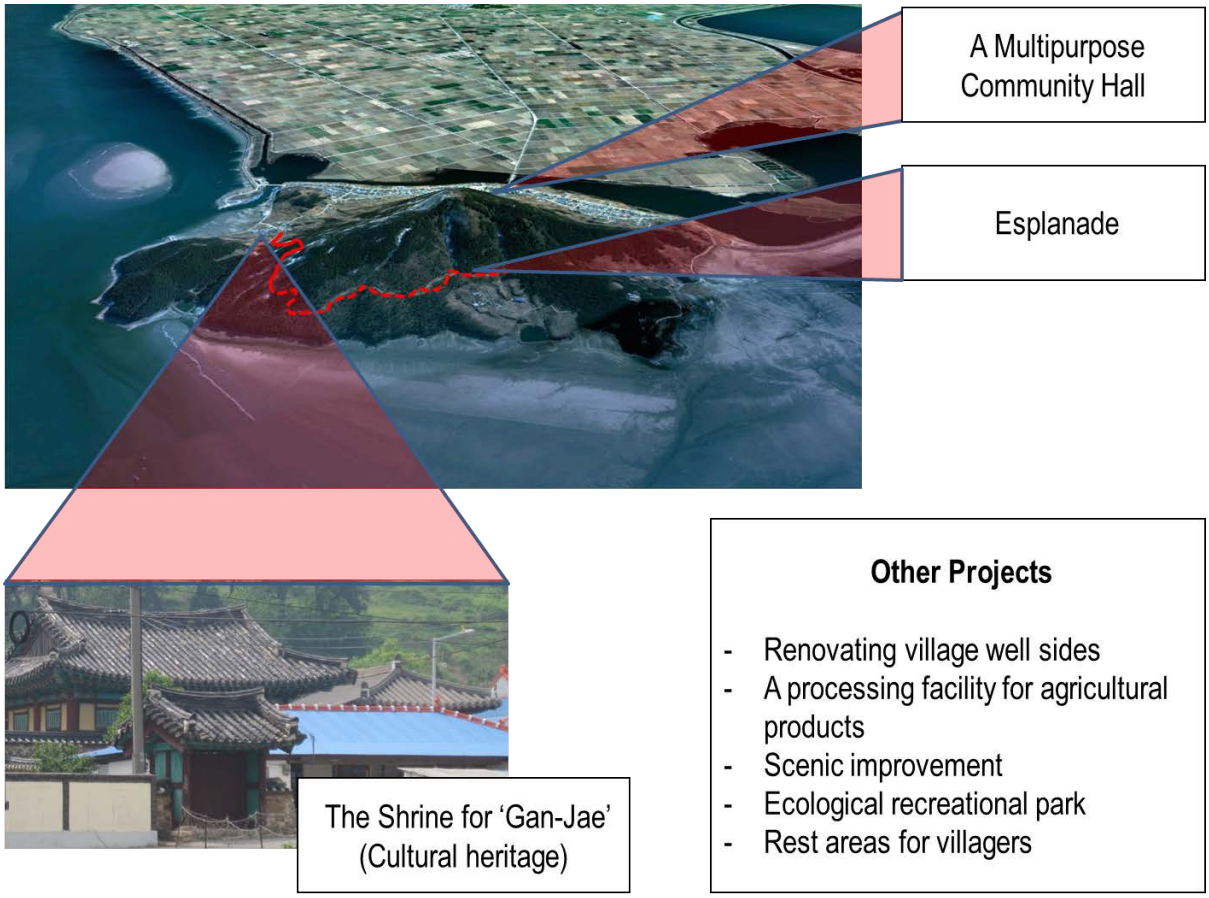

Figure 23. The outline of 'the Rural Village Comprehensive Development Project in *Gyehwa*-do Area'. [based on the notice of tender for the project (Korean Rural Community Corporation (KRC) 2011)]

After the completion of dykes in 2006, the government was aware of the discontent of the people in *Gyehwa*-township, especially the people in the villages in the old *Gyehwa*-Island. The government offered a 7 billion KW (7 million $) funding for a village development project on the condition that the government would review and accept the plan suggested by the village committee. The village committee, composed of village heads and

other members recommended by the communities, has been trying to figure out the best plan to utilize the promised fund by implementing both eco-friendly and income-generating facilities (see Figure 23). As of summer in 2011, they are looking for the contractors to fulfill the detailed design and constructions.[131]

Although the current status of utilization of their natural assets for sustainable development related scheme such as eco-tourism, apparently, reveals that *Simwon*-township is in a more favored position, the village development project in progress in *Gyehwa*-township may give the *Gyehwa*-township a chance to catch up. Moreover, the future internal development of the STRP may give another favorable opportunity to *Gyehwa*-township because it is located about in the center position of the planned administrative division delimited by the STRP. There is another possibility. Since the 2007 global economic crisis began, the progress of the internal development of the STRP seems to have been delaying partly due to the lack of governmental funding. Some local villagers think that the dykes which are blocking tidal flow now will be at least partially removed, which will be able to bring back the mudflats. In fact, even economically speaking, (partial or total) removal of the dykes would cost much less than the internal development, let alone the consideration of ecosystem or construction materials spared.

The head of *Simwon*-township, YeonKi Kim, points to an irony, saying that "the mudflats in the *Saemangeum* area died for the living of the tideland here in *Gomso*-bay! Remember? In the original plan in the 1970s, the *Gomso*-bay was the first to be reclaimed.

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[131] I attended the committee meetings during the fieldwork and had discussions personally with several members of the committee including the chair. They were eager to get every input available for the plan including me. The resultant scheme of the project seems a kind of compromise between the extreme sustainable development such as building wind power stations and the most conventional idea like leisure facilities to attract tourists. The activities of the project committee to prepare for the detailed project plan will be covered in the next section.

Not the tideland in the *Saemangeum*. When the *Saemangeum* project began in 1991, people here were disappointing. But things have changed. These days, the environmentally friendly development such as conserving mudflats like our township is regarded as more valuable". Considering the fact that, in terms of engineering and construction, the reclamation of *Gomso*-bay (which contain the whole mudflats of *Simwon*-township) is much easier than that of the STRP, the sacrifice of mudflats in the STRP area is the main contributor for the relatively stable development trajectory in *Simwon*-township.

5.2.5 Natural assets and the quality of life in the two townships

In this section, I reviewed the aspects of natural assets for individual's quality of life in the two townships. In terms of main individual assets - rice fields and real estate, despite the individual variance, the two townships seem to be equal. The same can be said to the hidden but important individual asset - vegetable gardens. Utilization of natural resources for sustainable development, such as eco-tourism, favors *Simwon*-township but the effects are limited, not because the mudflat experiencing centers are not successful (they are successful) but because the average consumption level for a Korean household is too high to benefit many households from eco-tourism scheme. To summarize, in terms of natural resources as an available asset for individuals, the quality of life in *Simwon*-township may be better but the difference between the two townships is not significant.

5.3 The Social Safety Nets in Two Townships

Many aspects of human quality of life rely on relations and institutions - family,

community, (un)official organizations that they take part in, and local and central government. Even 'I' exist as a relation or relations to 'myself' and 'I' can have many identities in front of those relations and institutions.[132] In this section, I will review the relations and institutions in terms of quality of life of individuals in the two townships from family to government.

5.3.1 Children - the allowance and the labor

Mr. Cho (YoungSoo Cho) has two sons and one daughter. The youngest (son, middle 40s) family lives in Taejeon city (the capital city of ChungNam province - neighboring province of North *Jeolla* province) but the daughter's (middle 50s) and the elder son's (early 50s) live in Kimje city and *Buan*-Eup, near Mr. Cho's home. As the elder son's family lives in the same township, they visit Mr. and Mrs. Cho often, at least once a month. In addition, to give a ride to their parents, the son and his wife usually come on calls by the Cho's. All three children of the Cho's seem to belong to lower class. Two sons live on day labor and the daughter does not seem well off enough to help her siblings or parents. Although Korean traditional sentiment of family is based on an assumption that children support parents financially, Mr. and Mrs. Cho's children simply cannot afford to provide large amounts of cash to their parents. However, they still make substantial contribution to their parents' wellbeing. Although the Chos usually use the bus for their trips, his son's van in the *Buan*-Eup provides timely transportations on urgent occasion like visiting the hospital in Jeonju city. The daughter-in-law, when she visits the Chos, usually brings fruit and side dishes

[132] For instance, Sen (2006) shows well that individuals should be regarded not as a single identity holder but as multiply affiliated being with many identities. Latour (2005) goes even further, arguing that (non-human) objects should be regarded as core agents which enable humans to possess (multiple) specific identities. I am aware that such multiplicity of individuals' identity and the agency of objects play a crucial role in shaping the relations and institutions of individuals and therefore their quality of life. However, in this study, I will focus only on traditional way of division of them - family, community, (un)official organizations and government.

which Mrs. Cho seldom purchases. Once or twice a year, in an occasion like the lunar New Year's Day or the Korean Thanksgiving Day, the Chos children visit and give allowance for their parents about 50,000 KW (50$) each. Moreover, their visit with grandchildren is the rare occasion when Mrs. Cho, who is usually blunt, shows a smile on her face.

Mr. Choi's (SungKwang Choi) six children (five sons and one daughter) seem more prosperous. The daughter and three sons live remotely in Seoul or Jeonju city but two sons - the second son and the fifth son live in the same township. The second son runs an inland shrimp aquaculture business and an eel/sushi restaurant. The only single child - the last son - lives in the same village and usually goes to the breeding ground with Mr. Choi. Three sons (the second, the fourth in Jeonju city and the last) are almost partners for Mr. Choi's aquaculture business. Like the Cho's children, in the traditional holidays, the children in Seoul and Jeonju city also visit the Chois with their grandchildren. Although Mr. Choi is wealthy enough not to request anything to their children, he always favors the first grade fruit (apples and pears), brewed doses of oriental medicine, and electronics that their children send to him. In addition, like Mr. Cho's children, Mr. Choi's children give allowance to their parents in traditional holidays and their birthdays.

Besides the emotional comfort and pleasure like grandchildren, children of the residents in the two townships provide two types of substantial help to their parents: the allowance and the labor and services. First, as to the labor and services, even if most of younger generations in both townships choose to go out to the cities for their adult life, still not only the children staying at the township but also those living in the near cities are accessible to help their parents. One day the daughter in law of Mrs. Cho came in and helped her mother-in-law kimch-making. She says, "In any way, I have to come and help at least

when my mother (mother-in-law) prepare kimch. …living near".[133] Even if her visit is not for hard labor of large-quantity-kimch-making in winter, like other Korean women, she seems to think that helping mother-in-law kimch-making is a kind of an unavoidable obligation. In late November, at the Choi's house, the similar scene occurs. Not only the often-visiting daughter-in-law (the wife of the second son who lives in the same township) but also another daughter-in-law (the wife of the fourth son who lives in Jeonju city) came to help her mother in law. Preparing kimch for winter and the next spring took one full day, not considering the preparation of the materials for the job. Another event where grownup children are expected to visit their parents is the commemorative rites for ancestors. Such events occur in the lunar New Year's Day, the Korean Thanksgiving Day, the anniversaries of the dead, or the Hansik[134] in the early April. However, this year, 2011, Mr. Choi told their children not to come because they already held the rites in the lunar New Year's Day in February. Still, at the graves of the hillside in the village, a few families gathered for the Hansik rites. It is certain that the contemporary Korean society has lost most of their traditional customs and rites. Even in rural communities like the two townships, people have become lenient about observing the rites for their ancestors. Though, still the existence of such events gives certain forms of unconscious burden or labor to the grownup children and daughters in law.

This type of cooperation within families also functions the opposite way. Some

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[133] In Korea, Gimjang, the event for making kimchi in large quantities so that it may be stored and eaten during the winter is considered a major adult female family event. Since kimchi is the most basic side dish in Korean dining, the Koreans have made it in preparation for the cold season for hundreds of years. These days, due to the development of preserving technology such as kimch-refrigerator, many Koreans change their kimch-making custom to not one time event but occasional events year round. The daughter-in-law of the Mrs. Cho's visit in summer shows the change of the custom well.

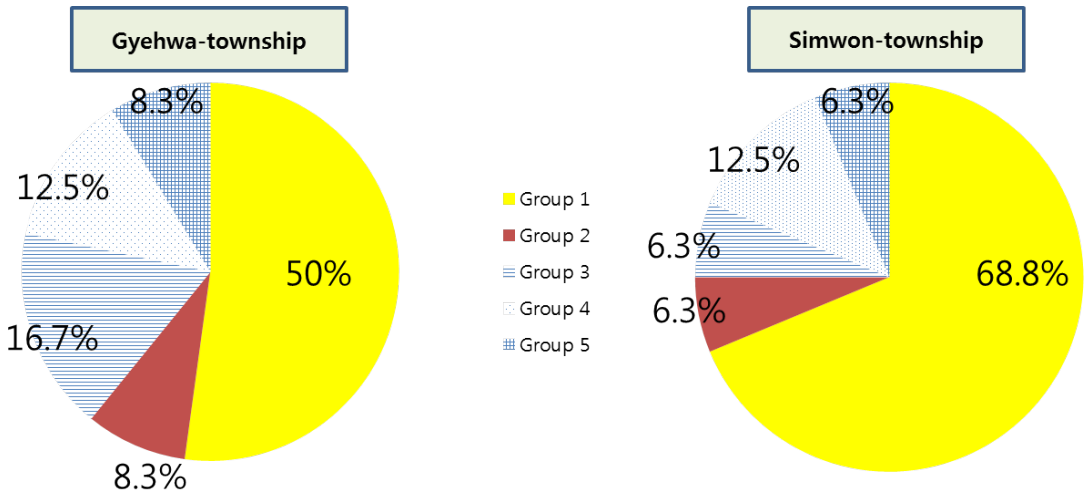
[134] Hansik is one of the traditional holidays. It is the 105th day after the winter solstice and is regarded as the day for trimming and weeding the graves as well as for the rite of commemorating.

grownup children ask their parents to take care of their own children (therefore, grandchildren to the parents). Although such cases are rare, they do exist. For example, JiEun Lee (74, female) in *Gyesang*-ri, a village in *Gyehwa*-Island looks after a two year old grandson on behalf of her daughter in law. Her son and daughter in law, both have to work in Jeonju city, suffering from low income and the high cost of monthly rent. Though she complains about the difficulty of looking after a kid in her old age, she accepts the labor as her job, saying "who else can care for him? I couldn't educate him (her son). (He) finished only elementary school. I wish (they) would earn money soon". She usually takes her grandson to the village pavilion, where other village members also can help take care of the kid when she goes to tend her vegetable garden. SuRan Yoon (70, female) in *Hajeon*-ri, a village of *Simwon*-township, also looks after a grandson who attends to the elementary school in the township. A widow (62, female)[135], in *YeonHwa*-ri, a village of *Simwon*-township live with two grandchildren. In her case, her son who ask his mother look after his two children pays her about 200,000 KW (200 $) a month. However, without such help from their parents, grownup children customarily give their parents cash - the second type of aid by children.

In both townships, grownup children typically provide some cash to their parents, though the amount provided is not always siginificant. A typical response when asked about their children's allowance is, as GunSuk Lee (62, Male), a village head in *Simwon*-township, says, "allowance? No, no. Lucky if not taking (it) from me (by my children). (They are) themselves busy in eating and living. … Once in a while, in (my) birthday, coming and give me money 100,000 KW (100 $), saying (that it is an) allowance. They do that, though. …

[135] She did not want to give her name, even as a pseudonym.

That kind of thing, (they) do". Two conflicting sentiments seem to coexist. One is to wish that they look independent enough not to receive money from their children. Another is to show off that, no matter how difficult their children's economic status is, they try to give their parents decent allowances at least comparable to other families. I grade and rank the degree of amount of allowances by children to compare the two townships, which is shown in Figure 24.



Children Group	Allowance	Description
1	Irregular in traditional holidays & birthdays	0 ~ 5 % of living cost of average aged person (over 65)
2	Irregular allowances & automatic utilities bills such as electricity, water, or phones	5 ~ 10%
3	Regular, about 100,000 KW monthly	10 ~ 40%
4	Regular, about 300,000 KW monthly	40 ~ 50%
5	Regular, about 0.5 ~ 1 million KW monthly	50 ~ 100%

Figure 24. The sum of the allowances provided by the grownup children to their parent household in the two townships. [from 48 interview participants in each township][136]

[136] Out of interview participants - 86 in *Gyehwa*-township and 76 *Simwon*-township. Only the responses that can be specified as one of the groups are included in the Figure 24. It is feasible that the remaining interviewees may receive irregular allowances from their children. In case of the group 2 – 'Regular, about 100,000KW (100$) monthly', most of the responses are about 100,000 KW.

Generally speaking, in most cases (about 50 ~ 70%), the amount of allowance annually is about 300,000 - 500,000 KW (300 ~ 500$) or below per parent household. Each grownup child may give 50,000 or 100,000 KW (50 ~ 100$) at the birthday or traditional holidays. If only considering the financial utility, it can be said that the allowance from children is comparable to the benefit of having a vegetable garden. Of course, the contribution of the children for the quality of life of the residents in the two townships goes beyond the utility of allowances or labor support. However, the traditional belief in rural communities that the children ought to be responsible for their aged parents is far from the reality.[137]

5.3.2 The community - the tradition and development

The life within a community is the center of people in the two townships. A variety of official and unofficial institutions exist. Village, age, gender, occupation, administrative power, country level economic structure, and personal interest play a unique role in organizing such diverse institutions. A sketch of the full spectrum of the institutions can be roughly drawn as follows.

[137] Cho's (2004) study shows the cases in capital metropolitan area in 2004. About half of the non-married respondents (45.5%) and about a quarter of the married respondents (22.1%) answer that they give the monthly allowance to their parents. Only 8 ~ 9 % of respondents answer that they do not give any allowance to their parents. Remaining majority give irregular allowances. There is no comparative study on allowances between rural and urban areas. However, it seems that there is not so much difference between the rural and urban areas. In my personal experience, I thought that giving at least the better part of the first salary to parents on getting a job was the social norm to follow, if not strict, when I began to work in the late 1990s.

Table 18. Major institutions in the two townships.

	Institution	Membership	Activities	Management
Communal	Village Head (Lee-Jang)	Election	- Representative of a village - Middleman between township office and village people	- Stipend from the district - Allowance from the agricultural cooperative
	Senior Group (No-In-Hoe)	Age (over 60)	- Managing communal events in a village	- Membership fee - Rental gains - Support fund from the district
	Youth Adult Group (Cheong-Neon-Hoe)	Age (20 ~ 60)	- Village feasts - Miscellaneous affairs in a village	- Membership fee - Contribution from the senior group
	Women's Group (Pu-In-Hoe)	No age limit	- Preparing food for events in a village	- Membership fee
	Development Committee	N/A	- Engaging in development projects	- Government funding - Village funding
	Fishing village society (Eo-Chon-Gye)	Occupation	- Protecting the interests of the fishermen in a village (trans-village)	- Membership fee - Working assets
Official	Fisheries cooperative	Occupation	- Governmental organization to provide financial & commercial services to fishermen (trans-village - district level)	- Governmental funding - Savings - Loans
	Agricultural cooperative	Occupation	- Governmental organization to provide financial & commercial services to farmers (trans-village - district level)	- Governmental funding - Savings - Loans
Unofficial	Fraternal society (Gye)	Interest	- Traditional fraternity clubs, varying according to the purpose of organizing	- Fraternity dues
	Religious group	Religion	- Churches or temples (trans-village)	- Offerings
	Mountaineering club	Interest	- Monthly mountaineering (trans-village)	- Membership fee

The title, membership, or how to raise the management expenses of the institutions in Table 18 varies from village to village. There exists at least a comparable organization with those listed in the table, though. The degree of participation of the institutions also varies a

great deal individual to individual. For example, Mr. Cho (YoungSoo Cho) in *Gyehwa*-township seldom attend a meeting or activity, although he is a member of the senior group, fishing village society, agricultural cooperative, and a church. None the less, he is not ill spoken of as a community member. He seems to have been more active when he was younger. On the other hand, Mr. Choi (SungKwang Choi) in *Simwon*-township is highly spoken of owing to the fact that he served as the village head, chair of senior group, president of the local branch of the fisheries cooperative, and chair of the school support committee. Now he retired from all the positions that he served but still he is influential in the village affairs. In this section, I will focus on one institution, the most dynamic and active - the development committee - and one location in which most of village events occur - the community hall or the senior citizen (community) center - to look into the relationship between the quality of life of villagers and the institutions.

The development committee is a temporary organization but it often becomes a standing institution. For example, when the *Hajeon-ri* mudflat experiencing center was established in 2004, the management committee of 'the Information Network Village'[138] had been already functioning to run the IT center for the village. The management committee members were selected from the fishing village society and the youth adult group. Because the building for the mudflat experiencing center was planned to share the same building with the IT center, the management committee naturally became a kind of 'development committee' to establish the mudflat experiencing center. The management committee currently runs the IT center and the mudflat experiencing center. In *Doe-ri*, another village in

[138] The Information Network Village (Invil) project was a governmental project to spread the information technology in the rural community embarked in 2003 by the Ministry of Public Administration and Security. *Hajeon-ri* was one of the 88 villages selected for the project, being provided funding, education, and facilities such as computers and Internet connection (The Central Association of the Information Network Village (정보화 마을 중앙 협회) N.D.).

Simwon-township, it seems that the development committee of the village began its activity as early as the early in the 1990s (Ju 2011).

Of all the villages in *Gyehwa*-township and *Simwon*-township, the development committee confederating nine villages in *Gyehwa*-Island must be currently the busiest one. The development committee[139] was formed in 2009 when the Korea Agricultural & Rural Infrastructure Corporation (KRC) asked the local communities to devise a plan how to spend a 7 billion KW (7 million $) funding by the government. The committee members were composed of the nine village heads and other four members whom the village heads recommended. Before the deadline of the plan submission by September, 2010, the committee tried to listen to as many opinions of the villagers as possible. Such a variety of opinions as suggested by the villagers and outside consultants reflect well the current trends of what a 'development' in a rural community looks like and what aspects of quality of life people prefer in their community life.

> If money is enough, with the money, it's better to build wind power generators. On top of the mountain. (If funding is not enough,) even if (villagers) have to raise additional money. … (If the fund is spent on a certain type of revenue-generating business,) later hunting for the interests occurs. Conflicts. (If using) Public fund (HaRyong Kim, 62, a farmer).
>
> (We) have to utilize the wetland.[140] (After drained,) in the land, (we) can grow some cash crops. (Once 7 billion KW – 7 million $ is invested, at least) 200 million KW (200,000 $) should return (annually). (We may) expand the farming cooperatives (in the nine villages) (JaCheol Ku, 55, a fisherman).

[139] The full title of the development committee is 'the Committee for the Selection of the *Gyehwa*-Island Rural Village Development Project'.

[140] There is a waterway or reservoir between *Gyehwa*-Island and the reclaimed rice fields.

> While doing such constructions (to implement the project), I'm sure that, such (corruptive) things will happen. Taking the right to spend the project fund, (their own authority is) nothing (to do with the fund) but (they will) wield the power. In the development committee, (privately related) people are engaged. The 7 billion fund of state must not be spent for an individual (GunSuk Lee, 62, former village head).
>
> (The committee) members are swayed too much. (They) have to drive forwards with brute force! (Doing like this, they can) make neither soup nor (boiled) rice.[141] How can they meet (the demands of) all the villagers? … No way. Surely, (the result will be) something not to blame. Not much profitable (JaeHyung Lee, 45, a farmer).

There are apparently several typical characteristics of the rural village project in South Korea in the development committee. First, women's voice is not heard. All thirteen members of the committee are men. When asked about the project, women were usually not aware of such project or seemed not to have much to say about it. Hahm (2010) and Park (2003) describe the feminized nature of the mudflats by emphasizing female barehand clam gatherers' expressions about mudflats. Not only is the traditional culture (and contemporary customs) in Korea patriarchal, but 'development' itself in South Korea seems patriarchal. I argue that, if the majority of barehand clams gatherers had been men, it might not have been possible to wipe away the livelihood (the mudflats) of the hundreds of 'men'. Second, even though the villagers have enough time (in the *Gyehwa*-Island development committee, more than one year) to ponder about their village development plan, the ultimate result shows similar appearances across the country. For example, as shown in Figure 23, the rough result of the activities by the committee is a 'building' (community hall), ecological park area, repairing the shrine, and other small scale improvements. These are the typical components

[141] A Korean idiom. Neither soup nor (boiled) rice means that there is no concrete outcome.

of the contemporary village-level development projects around the country. Such huge funding in terms of a township as 7 billion KW (7 million $) in the *Gyehwa*-Island could have been used for a more sustainable livelihood of the local people. The wind power installation suggested by several villagers can be regarded as one of such innovations. However, the compromise between the fund giver (the government officers) and the receiver (the committee members) cannot justify the amount of funding without constructing decent engineering works like several story buildings

Third, once constructed, the public facilities, especially the multipurpose community hall has to be permanently supported by the district. For instance, the expense of the fuel for heating or cooling the community halls (about 1.5 ~ 2 million KW – 1,500 ~ 2,000 $ - a year) are funded by each district. Of course, when a project is devised, it is usually assumed that, the village will be able to manage the cost of those facilities in the near future. Such success rarely happens. Nevertheless, at least as long as the aid by the government exists, the villagers can enjoy the benefits.

In sum, the development committee functions as the spearhead of the change in a village. In addition, it functions as an attractor of the government funding, and therefore, of a long term support of it, too. While other communal institutions are organized mainly to arrange the traditional or customary events and affairs, the development committee seems to be a symbol of a development era - the internalization of the state-driven economic growth or development 'spirit' of the last half-century in South Korea.

Although there are various institutions in a village (see Table 18), their activities occur usually in one place - the community hall or the senior citizen (community) center. The center is normally composed of two or three rooms, two of which are for male and female

villagers and remaining one is for meetings such as the village plenary session. Some villages have separate buildings for women and men. It is common that the room for women has additional space such as a kitchen. During the farming season, the centers are empty or locked. In summer, the villagers usually use the community pavilion rather than the community centers. In the pavilion, men and women share the space, though each group occupies a certain corner. Women gather and talk while they are doing miscellaneous housework such as cleaning cabbage or pruning sweet potato vines. Men also gather and play cards. Although the air conditioners are equipped in the community centers, they are hardly used.

In winter, the leisure season for rural people, they visit the community center almost every day. Not all but many villages have meals (mostly dinner but sometimes lunch and dinner) together in winter. The period and the participant percentage vary village to village. For example, in *Yonggi-ri*, a village in *Simwon*-township, at average a dozen people (mostly women) have dinner together December to April. In *Doe-ri*, another village in *Simwon*-township, more than forty (men and women together) have dinner together from December to February. For some aged villagers, the community center practically functions as their home in winter. One apparent problem of this beneficial getting together is the sense of alienation by the younger adults. Although the community centers and in fact all the activities in a village do not exclude younger age group, the arrangement of village affairs by the institutions cannot avoid such alienated sentiment. JaeHyung Lee, a 45 year old farmer, says, “I have not intended to evade sharing time with the seniors. Only my feet do not go with them”. However, the conflicts between the senior group and the youth group are hardly heard. It seems to me that, in terms of social network and at least in the two townships, the social

worlds by the youth group (those who are younger than sixty) and by the aged group (mainly over sixties) are completely different. There is no need to conflict.

In the same village where Mr. Cho resides, an old widow died in a hot day of July. Her body was discovered several days later after her actual death. According to Mrs. Cho, she had suffered from the loneliness for a long time even though she had a son, who lived in a remote city. This event would not be a news story if she had died in Seoul or another big city. I had expected that the villagers would show deep deploration about her lonely death. Surprisingly, when I asked their opinions on such death, the Cho's did not show any shock or nervousness. However, as an outsider and observer, I contend that it is a mistake to regard such a death as a symptom of the deteriorated social ties in the township. To the contrary, the social safety nets in the two townships, the typical rural communities in South Korea, usually functions well especially for the aged group. A variety of traditional institutions combined with the development spirit, epitomized by the development committee seem to be optimized for the improvement of their quality of life. Of course, I do not argue that their standard of living or level of consumption is comparable to the average country level or they themselves are satisfied with their own conditions. As I mentioned above, their subjective happiness evaluation is lower than that of people in the cities (Jeollabuk-do (North Jeolla Province) 2008a).

However, well-functioning family-level or community-level social safety nets have deeper roots in the life of the villagers than described in the above section. Above all, the core institutions whose activities are unfolded centering around the community hall or community center – village head or senior group – have rich historical backgrounds. They are not just arbitrary organizations for the administrative convenience or friendly societies. They

are the threads with which the villagers have weaved their everyday life for already hundreds of years based on the combination of unique biocapacity (rice paddy, irrigation, forest, fishing grounds), organizing ideology (Confucianism), and cultural practices (elders first conventions and the worship of family ancestors). The archetype of such institutions – 'Local Convention' (*Hyangyak,* 鄕約) – was already established in 16th century and spread around the Chosun dynasty throughout the 17th – 18th century.[142] Although *Hyangyak* began as a wish of the ruling class of the Chosun Dynasty to cultivate the people they governed by Confucian doctrine, essentially it became autonomous civilian regulation for common and mutual existence; in other words, rather than Confucian doctrine governed the people, the local socio-ecosystem (the biocapacity plus cultural practices) absorbed Confucianism as a means to organize itself. This practical characteristics of utilizing ideology of Confucianism as a tool to serve people and ecosystem are reflected in a variety of local customs such as '*doorae*' (cooperative farming), '*poomasy*' (mutual exchange of farming labor), folk festivals ('*nongak*' - traditional Korean music performed by farmers) or '*gye*' (mutual assistance unions).[143]

Of course, the rapid industrialization in South Korea during the last half century seems to have swept away all such traditional institutions and customs, not to mention Confucian doctrine. In addition, the current demographic transition to nuclear family, the super-aged society, and single-person household seems to have accelerated the disintegration of such traditions. I admit that such disintegration is fact and most of the traditional institutions have disappeared. There is no doubt of this. What I claim by suggesting that the community-level

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[142] Refer to Doopedia .

[143] Refer to Shin (2010). Yoon (2010) lists up other form of rural cooperative institutions such as '*goji*', '*sogyeri*', '*sobaenaegi*', or '*moe-seum*', too.

life of the villagers in the two townships are at least not less sustainable than that of other regions in South Korea in terms of sustainable development defined as in this study (sustainable development as a result of both Personal Ecological Footprint and quality of life) is not the existence of such traditional institutions themselves but the conditions for the existence of such institutions.

First, the various organizations of the villagers could sprout up from the natural assets – the rice paddy, forest, or fishing grounds. In other words, as long as the natural assets exist, they can provide the villagers with certain types of organizations institutionalized to function as social safety nets. Second, in spite of the fact that the traditional institutions such as '*doorae*', '*poomasy*', '*nongak*' or '*gye*' disappeared or currently only nominally exist, knowledge and know-how of managing those institutions remain firmly in rural societies. Third, such traditional institutions were originally designed and operated in ecologically sustainable way for both human livelihood and the natural assets; therefore, the current global trends towards the environmentally friendly, sustainable, or green development can meet the local knowledge and know-how of the past institutions in a mutually synergistic way. JaeHyung Lee's (45, farmer) organic farming can be an example. He is a second son of an indigenous farmer in *Gyehwa*-island. After graduating in a college in Seoul, he had worked in several modern positions including a political journalist. However, about 2000, when he was in his mid-thirties, he decided to come back to his hometown to run a farm in a non-traditional way. He founded an agricultural farming association by using half his money and half the governmental aid program to grow several organic medicinal crops. In ten years of trial and error, he is now managing a relatively successful business. What surprises me most in his experiences is that, without any knowledge of the traditional institutions

mentioned above and without any intention of reviving such organizations, he has been taking advantage of the conditions for such traditional institutions. One, he chose the natural assets that exist uniquely in his home ecosystem – the in-between environment between in-land and the sea such as soil, weather, or topography (small hills, dry field, or rice field) to run his business. Two, he utilizes the labor force of his hometown village in both traditional and modern economic reasons. He shows respect for the elderly by paying 40,000 – 60,000 KW (40 ~ 60 $) per day for easy jobs such as weeding, harvesting, or pruning the medicinal crops while he can advertise the farming activities as organic as well as 'barehand' handling, which can be shown fairly environmentally friendly.[144] He recruits the labor force through his father and the village heads, which naturally recognizes the traditional way of organizing community activities (respect for the elderly). Three, when I asked him why he did not adopt more mechanical ways for the farming activities, he simply answered that his way would be more suitable for 'organic' farming and more beneficial way for the villagers. He has never mentioned any connection with traditional institutions nor has he shown any knowledge about them. One possibility is the fact that he often participates in the rituals of the Confucian temple. However, it seems to me that not the Confucian ideology but the unconscious awareness of the three conditions which makes his business beneficial for both him and the villagers.

The community-level safety nets in the two townships seem stronger than their appearances. From eating meals together in the community center to building together their new development enterprises through the development committee, from traditional forms of gathering like Senior Group (*No-In-Heo*) or Women's Group (*Pu-In-Hoe*) to the new

[144] According to Song, InSang, he uses about 2,000 man-days per year for his farming. Therefore, he spends about 100 million KW (10,000$) a year to his villagers. It seems that the number of such villagers is about 100.

gathering for working in an organic farming business, the communal activities combining villagers' organization and the ecological assets show deep-rooted local customs under the guise of totally different naming and technology. Along with the practices for family ties such as allowances and family labor, the quality of life of the two townships in terms of community-level safety nets is in similar patterns – natural asset based, consistent with the traditional rural institutions, and ecologically healthy.

5.3.3 The social welfare - the local and central government

As the relational aspects of individuals, the local and central government is the most distant compared to the family or community. However, in its influence and power, it can be the nearest to the individuals. As for sustainable development defined in this study, for example, the value of Personal Ecological Footprint of an individual is not so much a result of his or her own consumption level but first and foremost determined by in which country he or she is born. In this section, among many types of relationships between individuals and the government, only a few but the most relevant ones will be dealt with such as the pensions, the compensation for the STRP, and other supports for the individuals by the government.

First, the national pension system is an important source of insurances for the citizen in South Korea, and this can also be applied to the villagers in the two townships. National pension system was first introduced in 1988 and extended to the rural area in 1995, finally accomplishing the compulsory coverage of all citizens in 1999 (National Pension Service (NPS) 2009). In the rural district level, for the elderly who could not meet the 10-year requirement for an old-age pension in the early stage of the National Pension scheme history, the special old-age pension program commenced in 2000. However, despite even the special

program, the majority of the elderly in the rural area couldn't get the benefits from the national pension system because they were not qualified to even specially revised requirement. For instance, Mr. Cho (YoungSoo Cho) in *Gyehwa*-township does not receive any pension. The government introduced another special pension scheme called 'the basic old-age pension' in 2008 to provide pension such the elderly as Mr. Cho (The Ministry of Health & Welfare 2009). As of 2011, the basic old-age pension program is designed to cover the lower 70 % of the elderly over 65 years old in terms of income and properties. As a result, the 70 % of the elderly around the country receive about 40,000 - 90,000 KW (40 ~ 90 $) per person monthly. As for the Cho's, about 140,000 KW (140 $) is given to them monthly. The coverage of the two pension programs in the two districts can be summarized as in Table 19.

Table 19. The primary pensions of the villagers in the two townships and their coverage.

District	Basic Pension per recipient (Monthly, KW, 2009)	Coverage	Basic Old-Age Pension per recipient (Monthly, KW, 2010)	Coverage
Buan	186,555	43.5%	80,000	79.3%
Gochang	153,316	51.2%	80,000	79.3%

Note: Coverage = the percentage of the covered elderly over 65 out of the total population of the elderly over 65 [basic pension data from the *Buan* District Office (2010) & *Gochang* District Office (2010a) and basic old-age pension data from the Ministry of Health & Welfare (2011)].

Most of the interviewees describe the basic old-age pension program as a kind of transportation allowances given from and distributed equally from the government, rather than as a pension. Considering that both pension programs are run for the elderly over 65 years old, it is certain that they play a significant role in securing the livelihood of the villagers in the two townships.

Second, the Korean government has been compensating the economic loss of the

Saemangeum region due to the STRP since its beginning in 1991. As of 2009, total 14,015 cases, about 448 billion KW (448 million $), were executed. There are still 245 cases, for a total of 4.7 billion KW (4.7 million $), that are scheduled to be executed (Jeollabuk-do (North Jeolla Province) 2009). The detailed compensation breakdown according to the type of the fisheries and the loss in *Buan* district, and the annually executed compensations in the whole project area are shown in Table 20 and Figure 25.

Table 20. The compensation for the STRP in *Buan* district (1991 ~ 2009). [from (Jeollabuk-do (North Jeolla Province) 2009)]

Classification			Running total by 2009
License fishery	The fisheries based on the license (aquaculture, fixed shore net fishing, common fishery by the village fishing societies)	Number of Cases	150
		Amount (million KW)	56,680
Permissive fishery	The fisheries based on the permission (fishing boat fishery, fry eel catching business)	Number of Cases	349
		Amount (million KW)	10,743
Barehand fishery (Reported)	The fisheries based on the report by the fishermen (barehand fishery, net-casting fishery, diving-and-catching fishery)	Number of Cases	3,494
		Amount (million KW)	25,053
Compensation for business	The business impacted indirectly by the loss of the fishing industry (marine product processing industry, marine product purchasing & distributing business, fishing boat repairing business, etc.)	Number of Cases	156
		Amount (million KW)	24,556
Compensation for area loss	The loss of area by the expropriation for the STRP	Number of Cases	1,294
		Amount (million KW)	6,065
Other compensation	The fisheries activities not based on license, permission, or report	Number of Cases	1,513
		Amount (million KW)	4,960
Total		Number of Cases	6,956
		Amount (million KW)	128,057

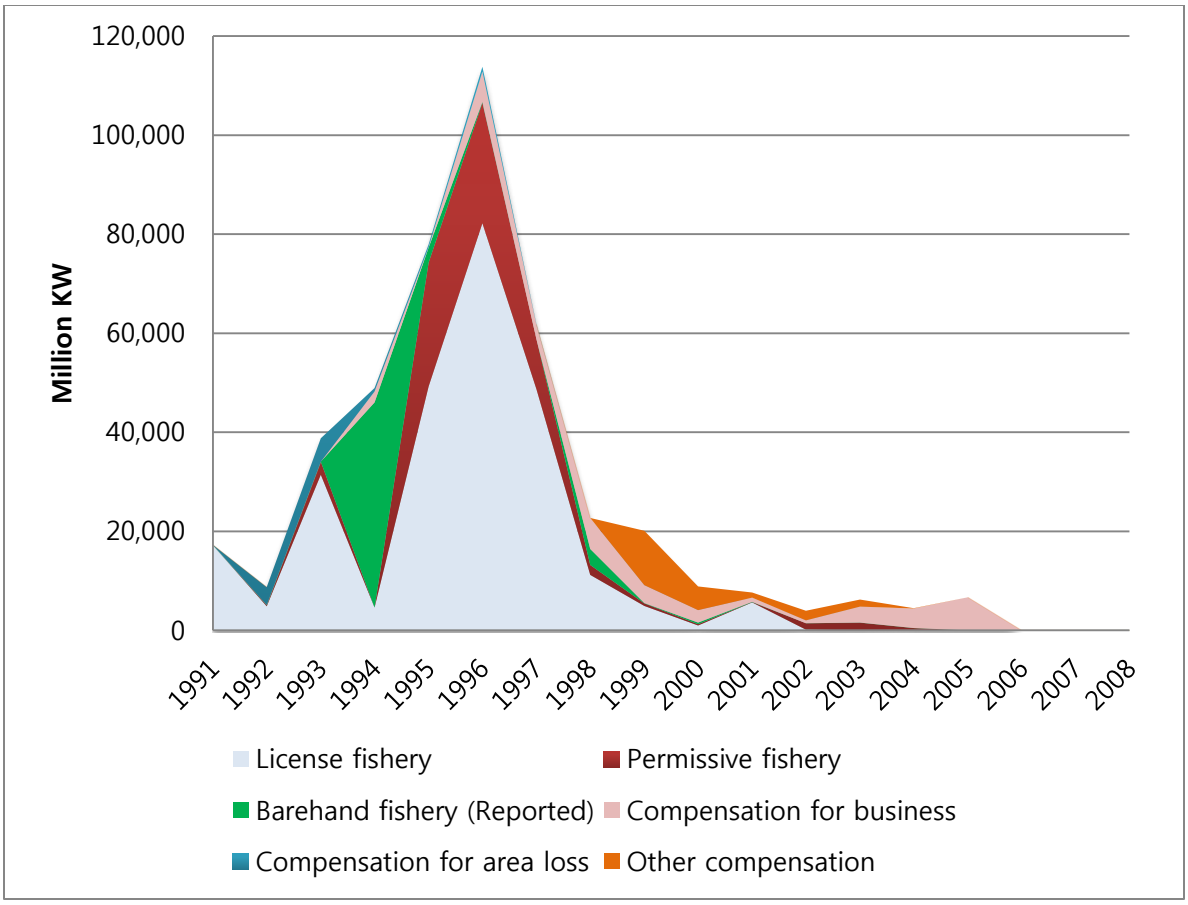

Figure 25. Annual breakdown of the compensation for the STRP, 1991 ~ 2008. [from (*Jeolla*buk-do (North *Jeolla* Province) 2009)]

What can be inferred from the long stretch of the compensation period is that the evaluating the damage and loss by the STRP was complicated and controversial. Among the controversies in *Buan* district over the compensations, the treatment of the barehand clam gatherers is the most prolonged and far-reaching. To begin, compared with the overwhelming number of cases of the compensation, the barehand fishery was relatively under-evaluated, as in the Figure 26.

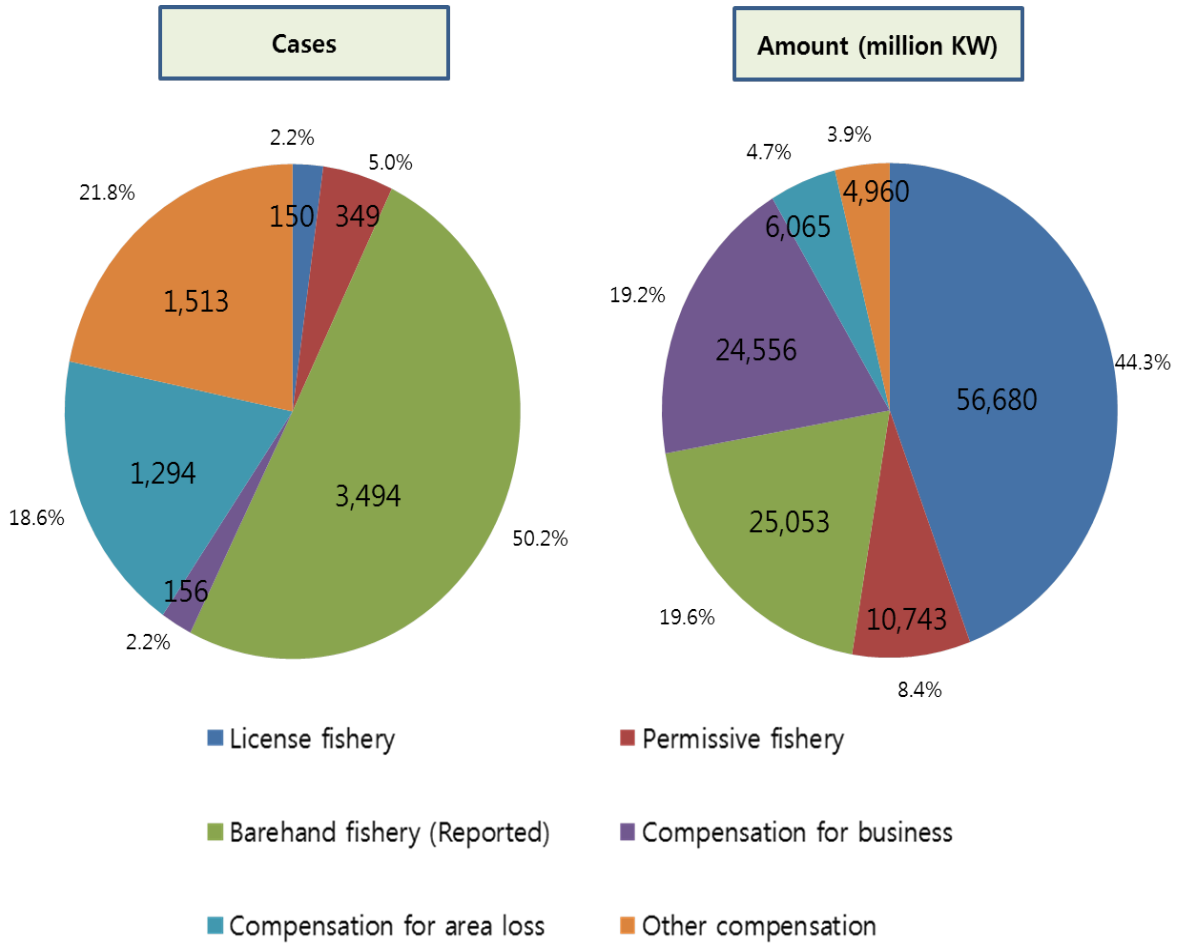

Figure 26. Distribution of the compensation for the STRP in *Buan* district - cases and amount. [from Table 20]

While the licensed fishery received 377.9 million KW (about 380,000 $) per case, the barehand gatherers were compensated only 7.2 million KW (about 7,200 $) per case. This is mainly because the license fishery and permissive fishery were well documented in the district or provincial records. On the other hand, all the barehand clam gatherers had customarily maintained their activities and they were told to report their status only after the STRP began in 1991. When the inspection of the damage and loss by the STRP for the compensation started later (1992 ~ 1994), many of them still didn't registered as 'reported'

barehand fishery performers, which therefore led to the exclusion of them from the compensation program. Among such unfortunately excluded, some were compensated later as part of the 'other compensation'. In fact, 1,513 cases of classified as "other compensation" out of the total 6,956 cases can be regarded as barehand clam gatherers who missed their chance to report their activities in the mudflats. Even among the cases of the barehand fishery compensation, it is argued that there were many frauds and corruptions. For example, Kim et al. (2006) report the interviews with the *Gyehwa*-township residents in the early 2000, in which the barehand clam gatherers expresses their fierce discontent about the compensation. Instead of the people who actually subsisted on the mudflats, many impostors, managed to receive compensation due to their access to individuals collecting compensation information. For example, the residents in *Buan*-Eup (the administrative center of *Buan* district), or those who had a friendly relationship with the compensation executing officials or the head of the village fishing societies became the recipients. Similarly, Hahm (2010) points to the cases where non-fishermen and non-residents received compensation, which stirred the local communities with conflicts and discontents because they were sure that someone in charge (like the village heads) helped the wrongdoers.

How did the local government assess the loss of the reported barehand fishery and what were the criteria to calculate the amount of compensation provided to each person? The overarching criterion was 'the amount of the three year average catch reported by the barehand clam gatherer'.[145] Then the real compensation would be the market price of the catch (reported three year average amount) minus the yearly fishing expenses (three year).[146]

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[145] The criteria and rules for compensation come from North Jeolla Province (2009:366-369).

[146] Why is the compensation based on three year revenue? There seems no specific reasons about it. The compensation guideline for the licensed fishery in the Fisheries Law and the Public Water Reclamation Act specifies 'the average of three year revenue' for the compensation of the permissive fishery (Jeollabuk-do

The actual assessments, however, could not avoid in their most part depending on the rule of thumb and guesswork. This was due to the disparity of productivity between fishing grounds as well as the difference of the degree to which individuals participated in barehand fishery. In addition, there was a matter of calculating the fishing expenses. Based on the study for compensation by the local university, the government decided to use the compensation rules as follows. First, the fishing grounds within the STRP area were divided into fourteen regions. The average catch in the fourteen regions was estimated by site survey and individual interviews with the barehand fishery and the market price was determined by the *Gyuckpo* consignment sale market. The net daily gain was calculated by deducting the average fishing expense (flat rate of 21.5% for all fourteen regions) from the sales based on the market price. Second, the amount of compensation per person would be, 'the daily net gain per person multiplied by the average fishing days per year and multiplied by three for three year income'. Third, the average fishing days per person was assigned by the degree of an individual's devotion to the barehand fishery – grades A, B, C, D, E, and F. If an individual went out catching clams on a daily basis, in other words, if the barehand fishery was the primary livelihood for him or her, grade A was assigned. Therefore, the 100 % of the aforementioned amount of compensation[147] would be given to grade A, whereas grade B (80%), grade C (67%), grade D (40%), grade E (33%), and grade F (20%) would be given reduced amount of compensation accordingly.

At this point – the assessment of grades per individual – arise the unjust compensations

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(North Jeolla Province) 2009:77). The university research on the compensation for the STRP funded by the government might just adopt this guideline of the laws above to devise a principle for the unprecedented compensation for barehand clam gathering.

[147] The amount of compensation for a grade A individual was from 10.4 million KW (about 10,000$) to 7.3 million KW (about 7,000$) and in average 8.86 million KW (about 8,800$) (Jeollabuk-do (North Jeolla Province) 2009:368).

discussed above. However, what was problematic seems more structural. For instance, in case that there is more than just one barehand gatherer in a household, the rule of the government was to assign (if the household primary livelihood came from barehand fishery) grade A to one member of the household and lower grades to others. It was not clear how many of the household members could be regarded as compensation recipients. Although the official standard of the government shows no limit for the number of recipients per household, the actual compensations seems to have been a maximum of two recipients.[148] Usually women gave up their rights and recommended their husbands or sons as recipients. Of course, within the household, the compensation could be redistributed between members smoothly but it sometimes brought about serious tension and conflict between mother-in-law and daughter-in-law and between parents and children (Hahm 2010). Hahm (2010) claims that women in the *Saemangeum* area were doubly victimized in the compensation process due to the combination of the cultural ideology (male supremacy) and the arbitrary government regulations.

However, even if the process of the STRP compensation has been flawed in many ways, as evidenced by the emergence of 76 lawsuits against government regarding compensations, I argue that the compensation during the STRP functioned positively for the livelihood of the villagers in *Gyehwa*-township.[149] Although many of the former barehand clam gatherers suffered from the loss of the mudflats and some left the township because their livelihood disappeared, the compensation 'was' executed and it must have helped the

[148] The interviewees in this study do not seem to know the exact criteria of the compensation, either. Their description of the grades, the amount of compensation according to the grades are not consistent. However, there was no household in which there were more than two recipients. Based on the ethnographic study in the late 1990s, Hahm (2010:318) also point out that the maximum recipients per household was two.

[149] Out of the 76 lawsuits, 21 cases were withdrawn, the plaintiffs won 5 cases, settlements were 7 cases and the state won 42 cases (Jeollabuk-do (North Jeolla Province) 2009).

villagers to recover from their loss to a significant point. For example, the Chos (Mr. and Mrs. Cho) could receive 8 million KW (8,000 $) each as the barehand fishery compensation. JaeYong Hong, a village head in *Gyehwa*-township, when asked how he could manage the level of consumption even if he did not seem to earn enough to support his living, told me that, he received a fair lump sum of the compensation for his fishing boat and he deposited it to a bank.

It is certain that the government should not have embarked the STRP in the first place if it would have intended to maintain more sustainable socio-ecological systems in the *Saemangeum* area. However, that does not deny the fact that the government contributed to the security of the quality of life among the remaining villagers in the *Gyehwa*-township through the compensation and other mechanisms directly and indirectly.[150]

5.4 Environment - the Surroundings of Living, Livelihood and Beyond

When I began to stay at the Cho's (in *Gyehwa*-township) and the Choi's (in *Simwon*-township), the first thing that distinctively met my senses was neither the sight by the idyllic scenes nor the hearing by the vernacular conversations full of dialects. It was the smell of villagers burning their waste. Although South Korea is regarded as one of the successful countries where the Volume-based Waste Fee System or the 'pay as you throw (PAYT)' system (J.-H. Kim 2007, Oh 2006), the residents in the rural communities prefer to burn their waste, rather than observe the governmental policy of purchasing

[150] An example of direct mechanism is the development committee mentioned in the previous section. Indirect mechanisms can be exemplified by the various forms of support policies for the rural area such as the basic old-age pension program, the midnight' electric power incentive, or the subsidies for the fuels used in agricultural or fisheries purposes.

the standard plastic garbage bags and sending them to the landfill sites.[151] This is not because the Volume-based Waste Fee System or recycling system is not applied to the rural areas. It is. I could see recycling bins next to the community center in almost all villages and food waste disposal bins in the township offices. The problems are the lack of manpower, equipment, and budget, such that the waste collecting vehicles are only dispatched to the township offices within each scattered rural village. Originally, the Volume-based Waste Fee System was developed for application in large urban areas. Therefore, experts recommend the government to adopt customized policies for the rural areas such as providing the facilities to dispose the incineration residues while exempting rural people from the compulsory Volume-based Waste Fee System or specialized collecting scheme for the waste agricultural plastic film treatment (Kim et al. 2006, Lee et al. 2006, Park et al. 2006).

There is another fact that was contrary to my expectation about the rural landscape in the two townships: their surrounding living areas are not clean. The streams near the villages or the coastline of the villages are used as the sinks of the sewage and the agricultural flow of pesticides and fertilizers.[152] Even if I had known such environmental problems in the rural areas in South Korea before the fieldwork, the encountering of the reality was helplessly shocking. I was amazed when I saw the smile on Mrs. Cho's face as she proudly told me how she could save the money to purchase the standard plastic garbage bags by burning her

[151] South Korea introduced the Volume-based Waste Fee System around the country in 1995. All the domestic waste has to be disposed by using the purchased standard plastic garbage bags and food waste should be treated separately from other type of wastes and recyclable wastes. The Volume-based Waste Fee System has been very successful. According to Kim et al (2006), in ten years since the nation-wide establishment of the new regulation (1994 – 2004), the average amount of waste per person per day decreased 23% - 1.03 kg, which is fairly lower than the OECD average 1.56kg. Lee et al. (2006) shows that, in the rural area, the average amount of household waste is much less than that of urban area and this is because the people in the rural area do not effectively separate the recyclable wastes and burn the combustibles.

[152] As to water, the public water-supply rates of the two townships reach almost 100%. However, the rates of sewage treatment are quite low. For instance, the distribution rate of public sewage system in *Simwon*-township is only 27.8% (Gochang District Office 2010a), and that in *Gyehwa*-township is 79% owing to the recent (2008 - 2010) sewage construction (Buan District Office 2010).

household wastes.

Ironically, however, the villagers are well aware of the importance of environmentally friendly production. While burning the wastes of his cooperative office in the front yard, a relatively young group farmer, JaeHyung Lee (45), explained how he had managed not to use pesticides or fertilizers for ten years to grow his cash crops to sustain the fame of organic agricultural producer of the plants and the organic products made from the plants. Another farmer in *Gyehwa*-township, JongGi Yoon (47), also seems well aware of the ecologically sustainable way of growing rice. In his rice fields, he leaves the dried stalks left after harvesting rice in the fields, instead of selling as the fodder to feed the livestock in winter. He says that his practice is much beneficial to the soil even if the short-term revenue is gone.[153]

How about the long term ecological changes? The elderly in *Simwon*-township who have lived over 70 years in their hometown remember the ecological degradation since the 1950s. EunHo Choi (77, a fisherman), describes it as an 'aging' of the mudflats. Until the 1960s, the villagers could catch a much wider variety of species within one kilometer from the coastline. Nowadays, many species of the crustaceans disappeared and within one kilometer from the coastline, almost nothing is caught. KyuKwan Lim (65, a farmer), reports the disappearance of a freshwater species, the marsh clam (*Corbicula*) which was abundant in the inland of *Yonggi-ri*, *Simwon*-township. They contend that this degradation began in the 1960s but accelerated in the 1980s. An interesting fact is the claim that, the huge amount of soil loss in the inland of *Gochang* district owing to the deforestation in the 1950s ~ 1960s, which still makes the *InCheon*-Gang (the *InCheon* river)[154] red brown color when it rains,

[153] One hectare of rice paddy, according to BuChan Lee, produces about 240,000 KW (240$) worth hays. The hays are sold to the middlemen, who sells them to the livestock breeders at about 1.4 million KW (1,400$).

[154] The InCheon-Gang (the InCheon river) is the major stream that flows into the *Gomso* bay. It runs 31 km across the inlands of *Gochang* district.

brought a nutritious flow of freshwater to the mudflats in *Simwon*-township. Considering the fact that the short-neck clam aquaculture in the township began in earnest in the 1970s, the increase of red brown soil inflow since the 1950s from the deforestation might lead to the favorable environment for the development of such type of aquaculture. However, there is no research on the topic and only the local clam breeders believe that.

Although the average villager in the two townships generally does not seem too concerned about the global climate change, a few of the entrepreneurial individuals are seriously concerned about it. Mr. Choi (SungKwang Choi), when asked about the prospect of his business, says, "in the long-term, global warming is the most serious concern. Atmospheric temperature rises. The sea water temperature rises, especially in summer. If the temperature rises more, the clams all die. The nuclear power plant also gives off the warm water".[155] JaeHyung Lee in *Gyehwa*-township worries about his organic crops, saying, "In reality, we live with nature. … This thing (climate change), we have no control over it. Unexpected natural disasters. The *Saemangeum* project is an artificial one, (therefore) I can raise my voice. Sometimes, I feel anxiety from the natural changes". He was considering the purchase of accident or disaster insurance.

Generally speaking, the two townships have experienced environmental degradation over the last few decades and the villagers have adapted to it. While their domestic sanitation has improved, their ecological surroundings have deteriorated. Their ecosystem seems stable but some of villagers are aware of the danger of the environmental change at a broader scale. However, it seems that most of them think that the ecological health is only a minor factor of

[155] About 20 km apart from *Simwon*-township, there exists a nuclear power plant complex (YoungKwang Nuclear Power Station). The Korea Hydro & Nuclear Power Co., Ltd. compensated the damage by the temperature rise due to the operation of the power plant (Gochang District Office 2010b). However, half of the area in *Simwon*-township was excluded from the compensation because it is farther than 20 km.

their quality of life .

5.5 An Evaluation - the Quality of Life in the Two Townships

According to the definition in this study, sustainable development is the ‘decrease of Personal Ecological Footprint while improving or maintaining the quality of life’. In the Section 4, the Personal Ecological Footprint comparison of the two townships shows that the values of Personal Ecological Footprint in the two townships cannot be said to be statistically different. In this section, I presented the various aspects of the quality of life in the villagers in the two townships - the assets (individual and the common), the social safety nets (family to community and the government), and the environment in brief. The quality of life comparison between the two townships can be summarized as follows in Table 21.

Table 21. The evaluation of quality of life in the two townships.

Classification	Features of quality of life	Establishment	Status for the township		Degree of influence on the quality of life
			Gyehwa	*Simwon*	
Assets - individual	Rice Direct Payment Program (RDPP) for the rice fields*	Since 2005	Improving	Improving	**High**
	Tax-free fuels for the farming & the fisheries	Since 1977 and extended in 1993[156]	Steady	Steady	**High**
	Rise of the real estate value*	During the 2000s	Increase	Steady	**Low**
	Vegetable gardens	Always	Steady	Steady	**Low**
Assets - the Commons	Mudflats*	Since 2004	Disappeared	Steady	**Middle**
	Eco-tourism*	During the 2000s	Planned	Improving	**Low**
Social safety nets - family	Allowance and labor from the grownup children	Always	Steady	Steady	**Low - Middle**
Social safety nets - community	Activities in the communities	Always	Steady	Steady	**Middle**
Social safety nets - government	Pensions* - Old-age pension - Basic old-age pension	Since 2000 Since 2007	Improving	Improving	**Middle**
	Other social welfares (ex - healthcare)	Since 1989[157]	Improving	Improving	**Low**
	Compensation for the STRP*	Since 1991	Given	N/A	**Low - Middle**
Environment	Degradation	Since the 1950s	Deteriorating	Deteriorating	**Low**
	Adaptation	Since the 1950s	Improving	Improving	**Middle**

Note: * is introduced after the beginning of the STRP.

[156] The policy of the tax-free fuels began in 1977 for the coastal fisheries and spread to agriculture afterwards. In 1993, the exempted taxes were extended to include the value added tax (VAT), the special consumption tax, and transportation tax (Yoon 2007).

[157] In South Korea, the first legislation for the national health service (NHS) in 1963 but it was not until 1989 that the NHS was extended to cover all the citizens (The National Health Insurance 2011).

It is hard to tell that the evaluation of the features of quality of life in the two townships reveals any significant difference. In terms of quality of life, many influencing features were introduced after the STRP, which seems to have functioned to buffer the impacts by the STRP for *Gyehwa*-township. In any way, because the comparison of the quality of life data between the two townships does not show the significant difference, this study reaches an unexpected result, which demands the answer to the second research question - 'if the level of sustainable development (Personal Ecological Footprint and quality of life) is not different between the two townships regardless of the existence of regional large scale development project (the STRP), how can sustainable development be explained?' In this section, I will devise a new question regarding this unexpected result and I will look for an answer or explanation based on the set of sustainable development tools developed in Section 3.

6. THE ENIGMA OF THE STRP

6.1 Introduction: Non-existence of the Difference of PEF and Quality of Life between the Two Townships

Similar to the Table 5 (page 27), the way which led me to an unexpected result – there is no significant difference of Personal Ecological Footprint and at the same time even the anthropological fieldworks lead to the conclusion that there is no meaningful difference between the impacted township and unimpacted one – makes me revise the research outline and face a new question (see Table 22).

Table 22. Research outline (revised)

<table>
<tr><th>Gyehwa-township</th><th>Simwon-township</th></tr>
<tr><td>Inside of & impacted by the STRP</td><td>Outside of & isolated from the STRP</td></tr>
<tr><td>Loss of most tideland</td><td>Tideland remains intact</td></tr>
<tr><td>High disruption of socio-ecological system</td><td>Low/no disruption of socio-ecological system</td></tr>
<tr><td colspan="2">↓
Comparison of the PEF values (Research Question 1)
↓</td></tr>
<tr><td>Difference in PEF</td><td colspan="2">No difference in PEF</td></tr>
<tr><td rowspan="3">Case-I</td><td colspan="2">Comparison of the ethnographic data</td></tr>
<tr><td>Difference in quality of life</td><td>No difference in quality of life</td></tr>
<tr><td>Case-II</td><td>Case-III</td></tr>
</table>

As to the Case-I and II, the STRP can be said to be (un)sustainable based on the definition of sustainable development in this study. What about the Case-III? Does that mean that, in spite of the socio-ecological disruption caused by the complete removal of tideland in *Gyehwa*-township, the relative sustainable development level can maintain itself quite steady? Or is the definition of sustainable development in this study wrong? Case-III does demand serious explanations, which leads to the second research question,

> Research Question 2): If the level of sustainable development (as defined in this study) does not show significant difference between the two townships in spite of the existence of a regional large scale development project (the STRP) in one township and not in the other, how can the vanishing of the seemingly disastrous ecological impact caused by the disappearance of the mudflat be explained?

Trying to answer the Research Question 2 involves putting forward another hypothesis. Proposing such a hypothesis and discussing it based on the data of this study may prove worthwhile for answering the question for the STRP in terms of sustainable development.

6.2 Approach to the New Research Question

Arriving at the Case-III where the differences of Personal Ecological Footprint and Quality of life between *Gyehwa*-township and *Simwon*-township are fairly negligible, the conclusion should be that the STRP had virtually no impact on the sustainable development trajectory in *Gyehwa*-township compared to that in *Simwon*-township. How could such a large project of more than 3 billion dollar investment during the last twenty years not impact people within the project area in terms of Personal Ecological Footprint and quality of life

while wiping out the whole tideland?

In this section, I will suggest a few explanations based on the ethnographic data as well as the secondary data. If the STRP would have functioned as an intervention in an (natural) experiment, influencing one township and not in the other, it could be easier to explain the STRP as both a proximate and ultimate cause for the difference between the two townships. However, as this study reached a conclusion that the intervention (the STRP) functioned not as a cause for difference but rather as a minor force which was overshadowed by 'other factors' that have kept the difference of the two townships minimal or insignificant, it seems that I need to look for those 'other factors' - broader than just the relationship between the STRP and the level of sustainable development of the two townships.

Force(s) or mechanism(s) that have sustained the same level of Personal Ecological Footprint between the two townships, which enables the similar amount of per capita flows of energies and materials (because Personal Ecological Footprint means the consumptive flows of energies and materials for people's living) to enter into the two townships must exist. In the past, before the tideland in *Gyehwa*-township was gone, a significant amount of capital must have been earned from the products out of the mudflat, which enabled the township to harness significant portion of the consumptive flows of energies and materials from outside world. Now, replacing such capital as from nature, what kind of capital makes possible the consumptive flows of energies and materials comparable to those in *Simwon*-township where people still can earn enough capital from within? Who pays for the inflow of energies and materials in *Gyehwa*-township and how? These questions must be beyond the proper scope of one study. In the next section, based on the reviewed sustainable development researches

in and out of Korea, only a cursory sketch of explanation will be drawn in the context of ‘development’ or ‘growth’ in Korean society.

6.3 The Enigma of the STRP and Possible Explanations

In previous sections, I concluded that the two townships cannot be said to be unequal in terms of sustainable development defined in this study. Why, in spite of the existence of the large scale development project (the STRP) for two decades, does the level of sustainable development (Personal Ecological Footprint values and quality of life) in the two townships only show minimal difference?

Of course, the conclusions in the Section 4 and Section 5 come from the design of this study itself such as the sampling method, data gathered, or the unavailability of the pre-STRP data. However, even if the sustainable development levels of the two townships had shown significant difference, it would have been smaller than expected. Therefore, it would still meaningful why is the influence of the three trillion KW (about 3 billion $) invested project with one primary ecological aspect (mudflats) in the region completely gone, so limited. In this section, I will examine several explanations for the enigma - emigration effects, welfare buffer effects, and the displacement.

6.3.1 The emigration of those who were impacted

The first possibility to explain the similar Personal Ecological Footprint values and quality of life status is that those who were most impacted by the STRP in *Gyehwa*-township simply emigrated during the last twenty years. In other words, because those who would have

had the most disrupted Personal Ecological Footprint values or quality of life status in *Gyehwa*-township caused by the STRP left, leaving those who have not been impacted as much. The evidence for this assumption may be revealed in Table 23.

Table 23. The transition of population in *Gyehwa*-township, *Simwon*-township and in *Buan* district, *Gochang* district: 1990 – 2009. [from National Statistical Office (1991, 2001) and the district offices (Buan District Office 2010, Gochang District Office 2010a)].

Township	**Population**	**1990**	**1990 - 2000**	**2000**	**2000 - 2009**	**2009**
Gyehwa	Total	8,897	-38.6%	5,466	-10.9%	4,868
	Over 65	608 (6.8%)	+55.8%	947 (17.3%)	+32.1%	1,251 (25.7%)
Simwon	Total	5,088	-36.2%	3,248 (36.2%)	-7.0%	3,022
	Over 65	461 (9.1%)	+41.9%	654 (20.1%)	+30.7%	855 (28.3%)
District	Population	1990	1990 - 2000	2000	2000 - 2009	2009
Buan	Total	102,805	-37.1%	64,621	-6.1%	60,661
	Over 65	9,055 (8.8%)	+36.7%	12,381 (19.2%)	+17.8%	14,582 (24.0%)
Gochang	Total	95,717	-32.3%	64,846	-6.2%	60,638
	Over 65	9,870 (10.3%)	+25.2%	13,194 (20.3%)	+18.4%	15,617 (25.8%)

In the two townships, we can see the two typical demographic characteristics of rural communities in South Korea; rapid urbanization and aging of population (see Table 23). Although more residents in *Gyehwa*-township emigrated during 2000 - 2009 than the average emigration rate in the two districts and *Simwon*-township, the general demographic trends over the STRP (1990 - 2009) period in *Gyehwa*-township are not significantly different from

Simwon-township or the district as a whole. Still, it is possible to hypothesize that, the small difference in the population decrease between the two townships (about 5% during 1990 - 2009 or about 400 people in terms of 1990 *Gyehwa*-township population) reflects the fact that, 'the 400 people who were the most impacted by the STRP in terms of Personal Ecological Footprint and quality of life emigrated from *Gyehwa*-township and as a result only the population who have the same Personal Ecological Footprint and quality of life as in *Simwon*-township remains'.[158]

Although not an emigrant during the STRP, YoungIl Cho (early 50s), the eldest son of the YoungSoo Cho in *Gyehwa*-township can be an example. He left *Gyehwa*-township in the 1980s and settled in *Buan*-eup (the administrative center of *Buan* district). His wife – the daughter in law of the Cho's – earned income through barehand clam gathering when she was with the Cho's in the 1980s but she was not qualified for the compensation of the STRP. They (YoungIl Cho and his wife) seem to have a very low profile in terms of social status. He earns a living as a day laborer such as a temporary construction worker. His income is unstable and not enough for their own subsistence, let alone for educating their two children (one in middle school and the other in a college). When I had a casual conversation with them during their visit to their parents (the Chos), the daughter in law said that she was going to work in the dykes of the STRP as a kind of charwoman.[159] She expects to receive about

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[158] Mr. Han (JaeSool Han, 50) can be one of such emigrants. Mr. Han was one of the interviewees for my thesis in 2006. He was one of the most active participants in the protests against the STRP. He was one of the local leaders of the anti-STRP villagers. His wife was a full-time barehand clam gatherer and also one of the most formidable female activists. During the 2010 – 2011 fieldwork, I tried to meet him but I heard that, after the sudden death of his wife by an accident in the mudflats, he left the township. However, many female interviewees who described themselves as active barehand clam gatherers in the past, still remained in the township. It is plausible that younger barehand clam gathering households (in their 40s or 50s, like the Hans) were more likely to move out than the remaining older villagers whose main subsistence means was barehand clam gathering.

[159] A scrubwoman or cleaning woman, who does clean the dykes. According to North *Jeolla* Province (2009:626-630), the local government launched a program of "labor support for the coastal fishing people in the

800,000 KW (800 $) a month from the temporary job. Considering the fact that, a not too old female barehand clam gatherer could earn 40,000, 50,000 – 150,000, 200,000 KW (40, 50 – 150, 200$) a day in the mudflats[160], their life seems to be worse than the case in which she could earn a living by barehand clam gathering. Like Mr. Cho's elder son's case, at least some of those who left *Gyehwa*-township during the 1990s and 2000s would lead a better life from the benefits of the mudflats.

This hypothesis – the emigration effect - can be tested by a longitudinal study of the emigrants from Gyewha-township. The difficulty with this test is how to determine an emigrant from *Gyehwa*-township as one of the 400 impacted people. The alternative way to test the hypothesis is to conduct a research targeted at all the emigrants from the two townships.

However, demographers report that, regardless of the country, the mobility (in case of the internal migration or domestic migration) among people in their 20s shows a peak (White and Lindstrom 2005). Within *Buan* district, the younger and the more educated are more likely to emigrate in the early 2000 (Kim 2003). Considering that this is also the national trend in South Korea (Choi and Lee 2007), it is unlikely that the pattern of the emigration in *Gyehwa*-township is primarily dependent on the impact of the STRP. In other words, the emigrants from *Gyehwa*-township left their hometown not so much by the local push forces

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Saemangeum area". The program aims at hiring the members of the household who were barehand clam gatherers and have a difficulty in earning their living by providing about 2 billion KW (2 million $) per year for ten years (2007 – 2016). The hired laborers are expected to work for such as environmental monitoring, management of the dykes, public water surface monitoring, seeding and gathering the salt plants, disposing the garbage inflows, etc.

[160] As mentioned in the Section *5.2.3 Mudflats – the Commons*, a barehand clam gatherer could earn 40,000 ~ 50,000 KW (40 ~ 50 $) a day even if they did not catch much (Lee, JeongRye, 74). If the gatherer was a young and skillful woman, she was able to earn 150,000 – 200,000 KW (150 ~ 200$) a day (Lee, YoungSoon, 77). Of course, barehand clam gathering could be performed only fifteen days per month and it could not be done year round. Nevertheless, the profit from it should be much more preferable to women like the Cho's daughter in law, compared to the government provided temporary dyke-cleaning work.

such as the development of the STRP as by the urban pull forces like education or employment.[161] The disruption of their (emigrants') life in terms of Personal Ecological Footprint and quality of life during the STRP may be a factor of the emigration but its influence is probably limited.

6.3.2 The buffering effects of the governmental social safety nets

It is probably true that the residents in *Gyehwa*-township have suffered from the STRP and their life in terms of sustainable development has been significantly disrupted (Hahm 2010, Jeon 2002, Ju 2007, Kim et al. 2006, J. Kim 2007). However, it is also the case that they may have benefited from many social safety nets that have been established since the STRP began in 1991. As discussed in Section 5, the major establishments are as follows.

> Since 1989, Nation-wide extension of the National Health Service (NHS)
> Since 1991, Compensation for the STRP
> Extended in 1993, Tax-free fuels for the farming and the fisheries
> Since 2000, The old-age pension
> Since 2005, The Rice Direct Payment Program (RDPP)
> Since 2007, The basic old-age pension

These social safety nets are especially beneficial for the elderly in the rural area, which in fact is the main goal of these legislations. Except for the extension of the National Health Service to all the citizens in South Korea in 1989, all other schemes have become active during the STRP period. As shown in Section 5, the contribution of these measures to the

[161] Kim (2003) conducted a survey targeted at those who had emigrated from *Buan* district in 2001 - the only study in this region. Out of the 45 respondents, 27 emigrated for educational and job-related reasons. 27 out of 45 were below 39 year old. 15 out of 45 were college degree or higher. Although sample size is small, the result shows the typical rural-urban migration patterns.

quality of life of the residents in *Gyehwa*-township and *Simwon*-township is direct and essential to the majority of the villagers. The villagers in *Gyehwa*-township seem to be fortunate enough to face the man-made disaster (the disappearance of the mudflats - one of the important assets for their subsistence) at the right time (the concentration of social welfare system establishment) at the right place (the rural area - where those enactments mostly targeted). Moreover, the rapid aging of population in the villages has functioned as a mechanism to expand rapidly the number of the beneficiaries of these new social welfare.

However, the benefits from these enactments reach *Gyehwa*-township and *Simwon*-township indiscriminately. Villagers in *Simwon*-township received no fewer benefits from them than those in *Gyehwa*-township. The only scheme in the above list confined to *Gyehwa*-township is the 'compensation' provided for those affected by the STRP. Therefore, if the buffering effects of the social safety net establishment can explain the puzzle of the STRP, the buffering effects should be so large that the impacts by the STRP in *Gyehwa*-township can, despite its existence, be negligible. Alternatively, the combination of the emigration and the buffering effects can be the answer.

While the age group over 65 have gotten the benefits from the newly established social safety nets, the younger group impacted by the STRP has emigrated. Although people in *Simwon*-township must have experienced the similar pattern of changes, the combination seems to have more explanatory power. Nevertheless, even if either the emigration or the buffering effects, or the combination of both can explain why the level of sustainable development (Personal Ecological Footprint and quality of life) in the two townships do not differ from each other, there still remain questions. Above all, Personal Ecological Footprint is about the level of people's consumption. It is about the material flow from the original

resources to the final consumption. It is about the energy flow from the energy sources to the end user's dissipation of heat, light or entropy and the emission of carbon dioxides. The emigration and the buffering effects of the social safety nets may be able to explain the quality of life similarity between the townships. They may be able to explain the similarity of the consumption level at the end points - *Gyehwa*-township and *Simwon*-township, too. However, they cannot directly explain how the similar level of material flows (from somewhere else) into the two townships have been possible even if one of the important local source of material flow for consumption (the mudflats) in one township (and not in the other township) is completely gone. I suggest a hypothesis - the mechanism of displacement – as a possible explanation of the similarity of the material 'flow', which is the subject of the next section.

6.4 What Replaces the Mudflats?

As discussed in Section 3, displacement is one of the key mechanisms in the theoretical literature on sustainable development. Displacement occurs when people with power shift their environmental burdens across space to somewhere else where people with relatively less power cannot help but accept the burdens (displacement across space). Displacement also occurs when the people living in the present dump the (potential consequences of) ecological problems onto future generations - displacement across time. Moreover, displacement does put the burdens and problems out of sight from the people with power. Such people may feel sympathy or empathy with the people struggling with the burdens and problems but they hardly feel responsible for them due to the blinding effect of

displacement.

Can we witness displacement in *Gyehwa*-township or *Simwon*-township? Can it be an explanation why the two townships now shows the similar level of energy and material in-flows reflected by not different Personal Ecological Footprint values? To begin with, let's look into the most apparent object of displacement - the mudflats.

6.4.1 Value of the vanished mudflats

I presented the unexpected result that, even though the ecological services from the mudflats have totally disappeared in *Gyehwa*-township, the resultant Personal Ecological Footprint value in 2010 - 2011 of the township is not different from that of *Simwon*-township. What this result means is that, the ecological services from the mudflats in the past (the ecological service as a resource and as a sink) are now provided by something else from somewhere else. To visualize this substitution, a virtual diagram of Ecological Footprint in *Gyehwa*-township in 1990 - 2010 can be useful.

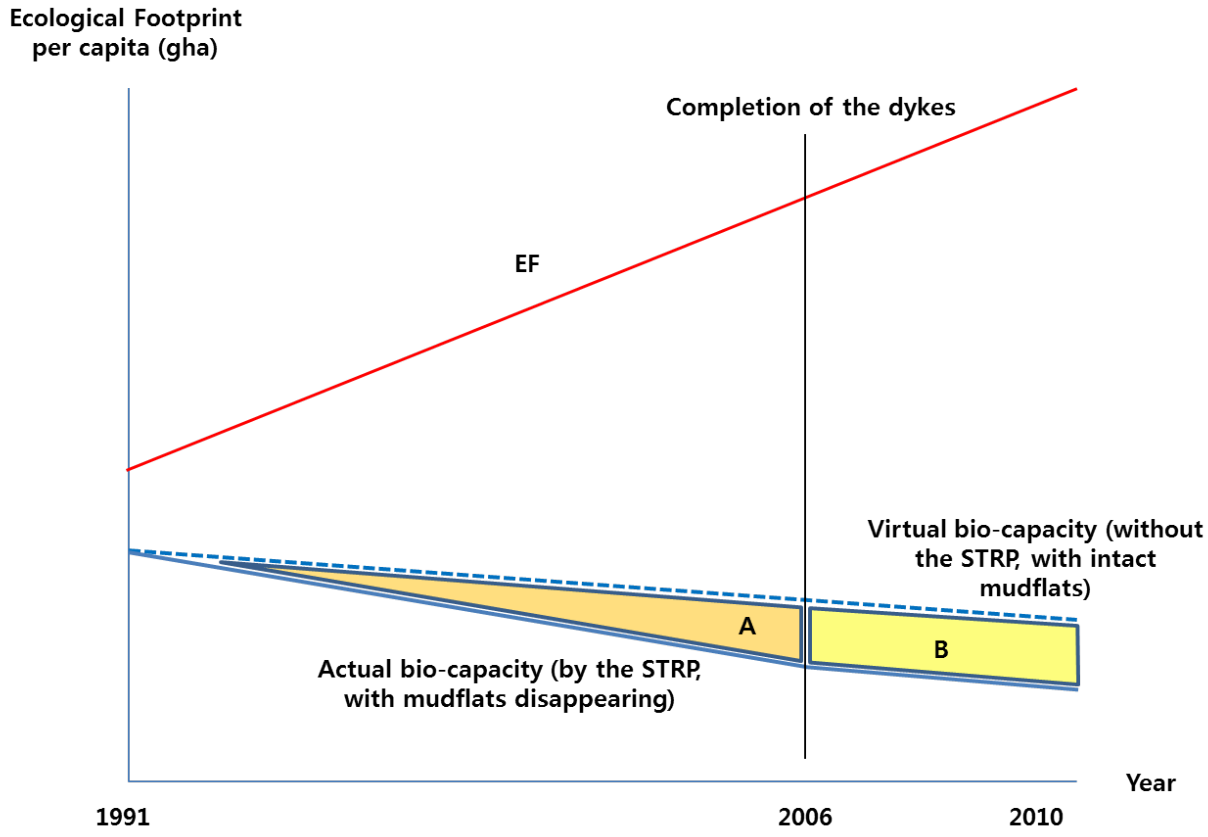

Figure 27. The change of Ecological Footprint versus bio-capacity in *Gyehwa*-township. Note: the blue dotted line is a virtual bio-capacity trajectory projected from 1991 had it not been for the STRP. The blue solid line is the actual bio-capacity trajectory. 'A' indicates the amount of ecological services displaced with the mudflats gone during the construction of the dykes. 'B' indicates the degree of displacement after the completion of the dykes.

From Figure 27, area 'A' and 'B' can be regarded as the direct degree of displacement by wiping out the mudflats. Of course, the actual extent of displacement must be bigger than the area 'A' or 'B', because the rapid increase of Ecological Footprint per capita demands additional in-flows of ecological services to support such increase. However, for a start, let's focus on the area 'A' and 'B'. How much are they? In other words, what is the value of the mudflats gone in the STRP area?

Table 24. The result of the economic evaluations of the values of the tideland in South Korea and USA. [from MLTMA (2004), p. 287, Table 6-32].

Sources	Values						Total	Area
	Marine Products	Water Purification	Leisure Value	Habitat Providing	Disaster Prevention	Conservation Value[162]		
Shin (2000)	-	-	-	18,236	-	14,454	32,690	STRP
JIT[a] (2000)	6,303	2,615	1,175	5,935	2,207	10,004	28,240	"
RRI[b] (1999)	3,581	577	1,954	4,991	2,207	-	13,310	"
Jeon, Shin, and Ha (2002)	-	-	-	-	-	9,575	9,575	"
Choi (1998)	3,695	4,123	417	-	777	-	9,012	"
Pyo (1994)	55,430	10,200	-	-	-	8,100	73,730	Youngsan River Estuary
KIIET[c] (1998)	5,110	3,830	400	-	-	-	9,340	"
Choi (2003)	7,380	10,261	-	-	-	-	17,641	"
Kang et al. (2004)	6,920	360	-	-	-	-	7,280	"
Yoo (1998)	-	-	1,855	-	-	-	1,855	Ganghwa Island/Others
KORDI[d] (1996)	9,027	3,832	395	6,995	-	-	20,249	"
Lee and Yun (1999)	10,479	4,177	1,455	-	-	9,153	25,264	"
MLTMA[e] (2001)	-	-	6,208	-	-	-	6,208	"

[162] Barbier et al. (1997) divide the economic values of wetland into two - use value and non-use value. Use value is comprised of direct values (as components/assets such as fisheries or foraging resources) and indirect values (as functions/services such as flood control or recreational). 'Conservation value' is non-use value such as bio-diversity, uniqueness, or cultural heritage.

Table 24 continued

Average (S. Korea)	**11,992**	**4,442**	**1,732**	**9,039**	**1,730**	**10,257**	**39,193**	
Woodward and Wui (2001)	1,165	-	907	703	-	-	2,775	Louisian a
Costanza, Farber, and Maxwell (1989)	2,509	537	1,189	23,570	-	-	27,805	"
Farber and Costanza (1987)	1,622	1,239	311		-	-	3,173	"
Farber (1996)	2,082	463	-	25,012	-	29,234	56,790	"
Average (USA)	**1,844**	**746**	**803**	**16,428**	**-**	**29,234**	**22,636**	

Note: Unit = 1,000 KW/ha, a = the Citizen-Government Joint Investigation Team to Assess the Environmental Impact of the *Saemangeum* Project (JIT), b = Rural Research Institute, c = Korean Institute for Industrial Economics and Technology, d= Korea Ocean Research & Development Institute, e = The Ministry of Land, Transport and Maritime Affairs (MLTMA).

Due to the nation-wide controversy over the STRP during the late 1990s and the early 2000s (Choi 2006), there have been many estimates on the values of the mudflats in South Korea. The Ministry of Land, Transport and Maritime Affairs (MLTMA) (2004) provides a good summary chart of such evaluations (Table 24).

It is difficult to estimate the area of the mudflats in *Buan* district before the STRP. Assuming the planned reclaimed land area[163] - 208 km^2 - was the area of the mudflats before the project began, the area mudflats within the *Buan* district was about 60 ~ 70 km^2. From Table 24, the amount of displacement by disposing the mudflats in the district can be 235.2 ~ 274.4 billion KW (235 million ~ 274 million $) annually and the displacement in the whole STRP area can be 815.2 billion KW (815 million $) annually.[164] For example, as to the 'water quality purification' value, in average, 92.4 billion KW (92 million $) annually would

[163] KRC Saemangeum Project Office (2008a).

[164] 39,193 KW/ha x 60 km^2 (6000 ha) ~ 70 km^2 (7000 ha) annually = 235.2 ~ 274.4 billion KW annually for *Buan* district. As for the whole STRP area, (208 km^2), 815.2 billion KW annually.

be necessary according to the evaluations.[165] If summing up ten year bill for the water quality purification service, then it would be 924 billion KW (924 million $). Is this plausible calculation? According to the Prime Minister's Office (Office for Government Policy Coordination for the Prime Minister 2003), the government planned to spend 1.46 trillion KW (14.6 billion $) for the expansion of the water treatment facilities in the hinterland of the STRP area and executed about 1.3 trillion KW (13 billion $) by the end of 2010 (Jeong 2011). Nonetheless, despite the investment of more than 1.3 trillion KW (13 billion $) over the last 10 years, the government still has not decided when to shut down the seawater circulation inside the dykes for fear that the water quality of the planned freshwater lake could not meet even the level of agricultural purposes.

If this is the case, the monetary numbers in Table 24 may be too low to reflect the real values that the mudflats provided in the past, let alone the incommensurable intrinsic values which cannot be translated into the economic valuations.[166] In addition, the installed water treatment facilities are fundamentally different from the mudflats. While the mudflats run the water purification service without the external costs, the water treatment facilities permanently require the input of the external energy as well as continual maintenance. Last but not the least, the mudflats are cost-free depreciation.

If the mudflats do not provide such various services as in Table 24 anymore, what (or who) is now responsible for them? Considering the fact that the material inflow into the two townships has not decreased (PEF value has increased and the quality of life has improved) during the STRP period and that there has existed another form of energy inflow into the

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[165] 4,442 KW/ha x 208 km^2 (20800 ha) annually = 92.4 billion KW annually for the entire STRP area.

[166] For example, as Hahm (2010) argues, the mudflats was the source of power by which women in the Saemangeum area could exert their relatively strong influence on the household matters. With the mudflats gone, how can we evaluate the economic value of the relative autonomy of women?

region to run, at least, the new water purification facilities to compensate for the vanished ecological service of the mudflats as an environmental sink, such material and energy inflows must have come from outside of South Korea.

6.4.2 Displacement to compensate for the ecological services gone with the mudflats

As for the sources of such inflows (materials and energy) to South Korea and ultimately to *Gyehwa*-township (or *Simwon*-township), it would not be reasonable to argue that individuals such as the Chos or the Chois are responsible for the displacement of the mudflats or, in that matter, any person or corporation in South Korea can individually make displacement happen. I suggest that displacement is a matter of a 'state', its level of industrialization and its relative position in the global political and economic relations.

Recognition that the existence of the unequal exchange between natural resources (or primary commodities) and industrial manufactures - has a long intellectual history that can be traced back to the 'structuralist school' in the 1940s - 1960s (such as dependency theory) and world-systems theory (Roberts and Parks 2009, Wallerstein 2004). Although it has never achieved a status of mainstream academic discourse, the ecologically unequal exchange thesis recently gains a rising interest and support along with the similar academic trends like 'ecological debt', 'ecological footprint', or 'social metabolism' as the climate change becomes one of the most urgent agendas in the globalized world (Hornborg 2006, Hornborg 2009, Martinez-Alier et al. 2010, Roberts and Parks 2009). In terms of individual, these lines of thinking means, above all, that, whether an individual can mark high scores on the tests of 'ecological footprint per capita', 'energy consumption per capita', or 'carbon dioxide emissions per capita' is not so much dependent on his or her personal competence or

achievement in his or her society but dependent on whether his or her country is located at a position in which it can wield a power to force other countries to accept the 'ecologically' or 'biophysically' unequal exchanges as the 'monetary' fair exchanges.

The last twenty years - 1990 ~ 2010 - of the STRP coincidentally overlap with the period during which South Korea achieve the top competitiveness in several core industries such as the shipbuilding, automobile production, semi-conductor manufacturing, or numerous other IT industries. The same level of sustainable development - Personal Ecological Footprint and quality of life - in *Gyehwa*-township and *Simwon*-township could not have been possible if the STRP had embarked in the 1960s ~ 1980s. The disappearance of the mudflats in *Gyehwa*-township must have impacted the township severely and therefore the level of sustainable development of the township would have been significantly lower than that of *Simwon*-township.

6.5 Sustainable Development or Sustainable Displacement?

The emigration effect and the buffering effect of the social safety nets (or the combination of the two) can be considered as reasonable explanations for the luck of the remaining villagers in *Gyehwa*-township at the right place and at the right time. However, making possible the inflows of the materials and energy to support such social safety nets and to replace the ecological services gone with the mudflats, as I claimed, demands more explanation. Although it is only my speculation and requires empirical evidence through future studies, I suggested that 'displacement' at the level of the state between South Korea and other countries is a plausible candidate for the explanation.

South Korea is one of the only thirteen countries that achieved GDP growing at an average annual rate of 7 percent or more for 25 years or more (World Bank and Commission on Growth and Development. 2008). That is now a past story. After the beginning of the new millennium, the annual GDP growth rate of South Korea has been 4 - 5% at average. Those who regard 'development' as a synonym of the GDP growth seem to feel a kind of sense of crisis. The incumbent president of South Korea, Mr. Lee, Myung-Bak was elected by the election pledge of '7-4-7 Plan' - 7% annual growth in GDP, $40,000 GDP per capita, and making Korea the world's seventh largest economy (Wikipedia 2011a). Maybe that is why the president Lee, even if South Korea had already established the Presidential Committee of Sustainable Development in 2000, had the Presidential Committee on Green Growth embark in 2009. In other words, at least for the majority of Koreans, sustainable development or green growth means 'once again, the glory of 7% annual GDP growth'. Or, is it only the wish of the Koreans?

In the world of 'economic development', not the growth itself but the growth rate is the real development. Even if an economy grows at 1%, it is still a growth; however, in terms of development, the decrease of growth rate means 'under'-development. Sustainable development in South Korea is a request for rejuvenating the aged economic structure in order to redouble the economic growth speed, by which it can boast again its youth.

According to the trajectory of Ecological Footprint and the biocapacity of South Korea during the last half century (see Figure 18), the only two periods when Ecological Footprint plunged are the 1998 IMF crisis period and 2008 global financial crisis period. Coincidentally, or more plausibly 'not' coincidentally, the two periods happen to be the only two periods in which South Korea's GDP growth rates plunged. Of course, this is an example

of the strong correlation between GDP and Ecological Footprint (Mostafa 2010). It may also reflect the trend of the rate of displacement in South Korea. In the worst case, the effort for sustainable development or green growth in South Korea can be comparable to an unconscious effort to increase the rate of displacement. The components of the oxymoron of sustainable development, then, may have to be revised into ‘sustainable displacement’.

7. CONCLUSION

7.1 Towards the Questions on Sustainable Development

Economic development or economic growth has been such a strong motive for the Koreans that the Koreans have become 'market persons' through the embodiment of the developmentalism and economism from the 1960s to the 1990s and through a modification towards 'marketism' since the IMF crisis (Choe 2011). Just four years after the declaration of the 'miracle' in economic growth by the World Bank (1993), South Korea plummeted to the point of asking for an IMF bailout loan in 1997. The first experience of minus GDP growth in their lifetime had a great impact on the Koreans.[167] What was once the ethos of Korea Inc.[168], to make oneself earn and manage money by export and grow, became internalized in every Korean's mind (Seo 2009).

I am also a Korean who went through with the 'internalization' process through the education and life experience in the 1990s and 2000s. Everyday was a battle for competitiveness towards self-development or self-improvement. As the goal of the country was GDP growth, so my individual goal was to be more competitive with other students and my colleagues. The inflow of global discourse on sustainable development since the 1992 Rio Earth Summit encountered this Korean ethos. As a result, the encounter provided sharp criticism to the STRP, providing the Koreans with the first nation-wide opportunity to look into the sustainability of their socio-ecological systems. Still, however, in the battle between

[167] The GDP growth rate in 1998 of South Korea was - 5.7% (The Bank of Korea (BOK) 2010). This was the first time since the - 1.9% record in 1980, which had been due to the second oil shock.

[168] Describing Korea as a corporation can be found in Shin and Chang (2003).

the environment and development, the powerful discourses supporting the priority of development and thus the continuation of the STRP won out (S. 이. Lee 2008).[169]

Sustainable development seems to be a natural consequence of the developmentalism and economism in South Korea when it faced the diminishing rate of GDP growth. In the first study of the STRP (Choi 2006), I showed that the STRP functioned as a catalyst to spread the awareness of sustainable development in South Korea. At least in terms of awareness and the use of the term, 'sustainable development', South Koreans have become fully enlightened. In this study, I tried to answer the next question. The STRP, has it had, at least within its targeted project area (for example, *Gyehwa*-township), a significant influence not in terms of abstract sustainable development awareness but in terms of the real sustainable development (as defined in this study, the combination of Personal Ecological Footprint and quality of life) on the people's way of living? To answer the question, I designed a comparative study between two rural, neighboring, and socio-ecologically almost identical (except the existence of the mudflats) townships - one within the project area and the other out of it. This dissertation is a report to answer the question.

[169] Also refer to Choi (2006).

7.2 Two Townships Equal in Terms of Sustainable Development – Equal Personal Ecological Footprint and Quality of Life

The result of this study - the comparison between *Gyehwa*-township and *Simwon*-township from the view of sustainable development defined in this study (Personal Ecological Footprint and quality of life) challenged my expectations. In 2010 - 2011, twenty years after the beginning of the STRP and four years after the completion of the dykes, the Personal Ecological Footprint values of the two townships appear to be the same and the status of quality of life is not distinguishable. What should have been disastrous to the local township (*Gyehwa*-township) or district (*Buan* district) - the total disappearance of the mudflats, which could be comparable to 815.2 billion KW (815 million $) worth ecological services annually[170] - seems to have had little direct impact. The process towards such conclusion is best summarized as follows (Table 25).

[170] See Section 6.4 for the calculation of the values in the mudflats.

Table 25. Summary of the study process and the conclusions.

Pre-requisite: The nation-wide spread of the awareness of sustainable development - the 1st stage of the STRP (1991 - 2006) [Choi (2006)]

Township	*Gyehwa*-township (in *Buan* district)	*Simwon*-township (in *Gochang* district)	Section 1 & 2
Location	Inside of the STRP	Outside of & isolated from the STRP	
STRP	1991 - 2006: completion of the dykes 2006 - 2030: the progress of the internal development	No project	
Direct impact by the STRP	Loss of the mudflats	Tideland remains intact	
Social impact by the STRP	High disruption of socio-ecological system	Low/no disruption of socio-ecological system	

↓

Definition of sustainable development: the composition of Personal Ecological Footprint and quality of life (the 'decrease of Personal Ecological Footprint while improving or maintaining the quality of life')

Research Question - 1 (a): Are the Personal Ecological Footprint values of the two townships different? (Has the STRP had a significant influence enough to make the Personal Ecological Footprint values of the two townships different?)

↓

Township	*Gyehwa*-township	*Simwon*-township	
PEF (gha)	4.16 (N=113, sustainable development=1.39)	4.45 (N=117, sustainable development=1.62)	Section 4
Not statistically different [t (228) = -1.448, p = 0.15]			

↓

Conclusion - 1: the STRP is neither sustainable enough to make the value of Personal Ecological Footprint in *Gyehwa*-township lower than that of Personal Ecological Footprint in *Simwon*-township, nor is the STRP unsustainable enough to make the value of Personal Ecological Footprint in *Gyehwa*-township higher than that of Personal Ecological Footprint in *Simwon*-township.

Table 25 continued

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Research Question - 1 (b): Does the status of quality of life also reveal no discrepancy between the two townships? (Has the STRP had a significant influence enough to make the quality of life measures of the two townships different?)

↓

quality of life - Features	Not different in the two townships	Different	
Assets - individual	- Rice fields - Tax-free fuels - Vegetable gardens	- Real estate value (higher in *Gyehwa*t-township)	Section 5
Assets - the Commons		- Mudflats (intact in *Simwon*-township) - Eco-tourism (earlier establishment in *Simwon*-township)	
Social safety nets - family	- Allowance and labor from the grownup children		
Social safety nets - community	- Activities in the communities		
Social safety nets - government	- Nation-wide extension of the National Health Service (NHS) - Tax-free fuels for the farming & the fisheries - The old-age pension - The Rice Direct Payment Program (RDPP) - The basic old-age pension	- Compensation for the STRP (in *Gyehwa*-township)	
Environment	- Degradation - Adaptation		
quality of life as a whole - Not significantly different			

↓

Conclusion - 2: the STRP is neither sustainable nor unsustainable enough to make the measures of quality of life in the two townships significantly different.

From the conclusions 1 and 2, I have reached a kind of contradiction - the socio-ecological impacts by the STRP (the disappearance of the mudflats) in *Gyehwa*-township did not distinguish that in-project area in terms of sustainable development from *Simwon*-township which received no impacts. This unexpected finding demands an explanation - why are the levels of sustainable development of the two townships not different and what is the mechanism that keeps them the same? This was summarized as Research Question 2.

Research Question - 2: If the level of sustainable development (as defined in this study) does not show significant difference between the two townships in spite of the existence of a regional large scale development project (the STRP) in one township and not in the other, how can the vanishing of the seemingly disastrous ecological impact caused by the disappearance of the mudflat be explained?

7.3 Explanations for the Unexpected Results

I advanced two explanations for the result: 1) the emigration of those who had been negatively impacted by the STRP in *Gyehwa*-township, 2) the buffering effects of the social safety net establishment during the STRP period or the combination of the two. Even if this is the case, however, I pointed out that it is still necessary to explain how the similar level of material flows (from somewhere else) into the two townships has been possible. I contended that, displacement, a state level phenomenon, can be a mechanism how South Korea has been able to shift the ecological burdens of the mudflats (as an environmental sink) to other countries while procuring energy and material resources by unequal exchanges (displacement across space). In addition, individuals in South Korea can hardly be aware of such state level mechanism (the blind effect of displacement).

The infrastructure of displacement - what enables a country to be a winner in the game of the unequal exchange of the environmental burdens - is the power of the industrialized economic structure of the country. The development of such infrastructure has typical aspects as we can see in the example of the STRP. First, to make room for the industrial complex such as the steelworks or shipbuilding yards, the weak socio-ecological area in terms of ownership (public water surface), socio-economic status (rural area), or political discrimination (North *Jeolla* province) is selected and disposed (for example, the mudflats). Second, such disposal of the ecosystem requires the re-procurement of the vanished ecosystem services (as resources as well as sinks) from somewhere else, which is the exact phenomenon of displacement. Third, the industrial facilities established in the newly reclaimed area after the previous ecosystem disappears function as the actual means of displacement. For example, the trans-national corporations which usually take up the newly established industrial complex, boasting their capability to produce and transplant the building blocks that can connect their own country (South Korea) and the other countries (the other end of the displacement relations) such as roads, irrigation systems, port facilities, power plants, subcontract factories, or training facilities for the operation, do the actual arrangements of the displacement with those countries. Fourth, the newly established industrial complex deepens the degree of displacement due to the fact that, unlike the previous ecosystem (for instance, the mudflats) which can function without any external costs, such new facilities demand external resources (energy and raw materials) and continuous management (another requirement of external resources) plus depreciation (yet another necessity of external resources in the future).

In Section 6, I showed that, by disposing the mudflats in the STRP area, about 800

billion KW (800 million $) annual displacement takes place let alone the incommensurable values of the mudflats. However, that is only the beginning of the story. There are no industrial facilities yet. Nobody knows how much more displacement will happen by finishing the internal development of the STRP. From the discussion above, I draw two plausible explanations and suggest a hypothesis to explain the absence of the difference of the sustainable development indicators between the two townships as follows.

Two explanations to the Research Question 2: 1) the emigration effect of those who had been negatively impacted by the STRP in Gyehwa-township. 2) the buffering effects of the social safety net establishment during the STRP period. Or the combination of the two.
A hypothesis to answer the Research Question 2: the level of sustainable development of the people in the in-project area (*Gyehwa*-township) is not determined by the regional development project (the STRP) but by the country level trajectory of the development path. The first stage of the STRP - the construction of the dykes - has brought about a significant effect of displacement, which cannot be said to be sustainable. However, the total influence on sustainable development in South Korea by the STRP will be determined by the progress of the internal development.

7.4 Benefits of Displacement - Improved Living Standards for Koreans

The beginning of this study was about the dilemma of sustainable development - between ecological sustainability (S of sustainable development) and material prosperity (D of sustainable development). However, the conclusion of this study goes inevitably towards, what Andersson (2010) calls, the 'global ethical trilemma' (see Figure 28). According to Andersson (2010), "[t]here is a genuine conflict between three generally accepted aims: prosperity, equity, and ecological sustainability. We can imagine how we could achieve two of these aims, but we can do this only by downgrading the importance of the third".

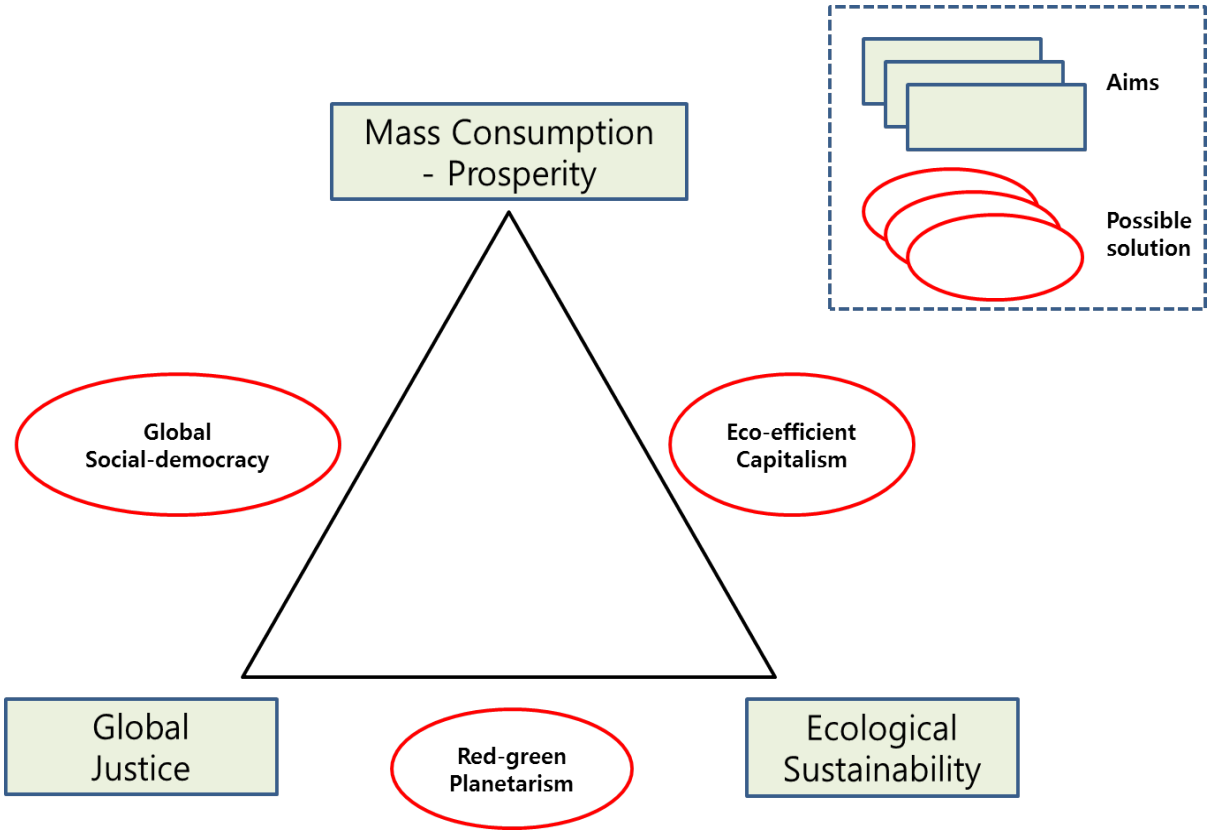

Figure 28. Global ethical trilemma. [from Andersson (2010:114)]

The nation-wide controversy over environment (ecological sustainability) versus development (material prosperity) centering around the STRP in South Korea shows well that, by focusing on two aims - prosperity and sustainability - we cannot but avoid the inconvenient aim - global justice - and continue to do 'displacement' - the mechanism of injustice. However, someone still can challenge this inconvenient injustice-driven discourse by saying that, 'what about generating almost about 50 million beneficiaries (the population of South Korea) of so-called 'displacement'? What about the improved living standards for Koreans? Is it not still a tremendous number of people? Is it not still magnificent

achievement of good?'

The villagers in *Gyehwa*-township or *Simwon*-township live in, what an economic historian Gregory Clark (2007) calls, the 'strange new world'. In this strange new world, unlike the past thousands of years of 'the Malthusian era' in which short-term gains in income through technological advances were inevitably lost through population growth, the advance of efficiency or the rate of productivity advance not only outpaces population growth but it also sustain the long-term innovation itself. South Korea may belong to the 'stranger new world'. Unlike their predecessors in the West, who took two or three centuries to escape the Malthusian trap, South Koreans broke out of it in one or two generations. Mr. YoungSoo Cho in *Gyehwa*-township, Mr. SungKwang Choi in *Simwon*-township, or most of the elderly in the two townships witnessed in their own life time the take-off of this post-Malthusian world in the 1960s, the compressed growth in the 1970s - 1980s, and the participation to the globalization in the 1990s - 2000s. Who can deny that, their standard of living improved unprecedentedly in only a half century? Who can deny that Koreans generally are the beneficiaries of such miraculous economic growth and development?

I do not deny that, and I myself am one such beneficiary. Every molecule in my body is the output of the working of the compressed growth or the miracle of Han-river. One of the contributions of this study should be the questioning that, while one accepts that the economic development (including sustainable development) does indeed create the genuine benefits for people, how can one ask the matter of injustice (displacement) in a practical way? Another contribution of this study in this regard may be that, finding a way to answer the question is, as in the case of the STRP in terms of sustainable development, not in the level of an individual development project or a region but in the level of state and global. Whether

ultimately the STRP will be an example of sustainable development or not will be determined in the context of the world.

7.5 Contributions of the Dissertation

The most significant contribution of this study should be its relevance to the evaluation of the STRP, which is in an in-between status after the completion of the first stage and before the internal development. By combining the ethnographic method and Personal Ecological Footprint measure, it may provide the policy makers with much richer context and consideration factors than the traditional cost-benefit analysis. The environmentally friendly or ecologically sustainable development of the reclaimed land in the STRP is determined not so much by the arrangement of the facilities within the project area as by the state level strategy and position in the global order. If anticipating that the beneficial effects of displacement around the world will diminish apparently in the near future, even restoring the original mudflats can be a policy option.

This study has both theoretical and practical implications for sustainable development research. First, it points out that, the pursuit of sustainable development based mainly on technological and (mainstream) economic innovation may not be very effective due to displacement and the rebound effects. This is not an unusual finding in sustainable development-related studies but the uniqueness of this study comes from the way to present it. Rather than analyzing separately, I tried to show that the two mechanisms of unsustainable development - rebound effects (the consumption increase > the technological efficiency increase > the real income increase) and displacement (transferring the burdens by such

increase) - are inseparable.

Second, as an attempt to tackle the complexity of sustainable development, I devised a set of sustainable development tools. The tools, of course, are far from complete. However, such an effort as to consider simultaneously the high-level sustainable development discourses, the core theoretical issues, the meanings of sustainable development to individuals, in the context of (anthropological) people's actual living can be useful to other studies. At least, it should be clear that, the matter of sustainable development is not a matter of one project or one region but a matter of the state and the global.

Third, this study can contribute to a specific area of sustainable development studies - unequal exchange. Most studies on unequal exchange (of energy, resources and ecological costs) focus on either side of the two end points of displacement. Political ecologists emphasize the devastating impacts by the global power disparity on the sources - mostly in the Third World - of material resources and the destination of the sinks while the scholars on sustainable consumption and production (SCP) usually tackle the consumerism and green technologies mostly in the developed countries - the sources of the ecological sinks and the destination of the resources. Unequal exchange is one of the core issues of sustainable development. My study aims at presenting a way to deal with it by paying attention to both sides of displacement.

Fourth, the search for an explanation of the absence of the impact caused by the STRP in terms of Personal Ecological Footprint through ethnographic data can be regarded as an effort to expand the Political Ecology approach. For this study reveals that, not only the disappearance of the mudflat (ecological disruption) is the result of the state level political and economic trajectory of development, but also the extent to which the disappearance of

the mudflat has an impact on the socio-economic aspects of the local people (quality of life) is again dependent on the state level development path of social welfare system, which coincidently has been enacted during the same period of the STRP as well as the same era during which South Korea has achieved the top competitiveness in many industries. In addition, unlike the existing typical works in Political Ecology, which usually focus on the Third World or developing countries (some important exceptions, e.g., (Robbins and Sharp 2003, Swyngedouw 2003)) and treat the target peoples and ecosystems as only 'reacting' to the external forces though they are depicted as having agency and active players, this study points out that what the ecological degradation can mean to the people in developed countries is very different from the typical cases in Political Ecology literature.

Last, the metaphor of 'aging' for sustainable development or sustainable development as an expression of the 'aging of development' has an intention more than just a metaphor. I intended, by using the metaphor of 'aging', that the phenomenon which we witness while calling it 'sustainable development' is not a matter of repairing, mending, or rectifying the long-standing hegemonic idea of 'development' but a matter of letting it go. In other words, rather than rescuing development by putting adjectives such as 'environmentally friendly', 'ecologically sustainable', or 'just and fair', why don't we let it be aging and die with the 'GDP-growth-is-all-we-need' mentality?

7.6 Future Directions

Sustainable development is a matter of cultural change. Although, as a philosopher Rorty says, "cultural change occurs not when people argue well, but when they speak

differently"[171], people may speak differently when they can see differently. Visualizing the two end points of displacement effectively is thus important considering the urgency of the sustainable development-related issues. However, the current tools to visualize them are only in an inchoate status. Vast data sets of the global sustainable development institutions such as UN, World Bank, or IPCC do not provide relevance to individuals who are struggling with the day to day matters of how to make their livelihood more resilient to sustain and improve their quality of life during the period of constant economic crises.

The STRP can be the natural experiment for such visualization of sustainable development. The second stage of the STRP can be a research opportunity to devise a way to make sustainable development relevant to individuals based on the visualization. Careful attention should be paid to whether the 'green growth' - the official goal of the government as the actual initiative for sustainable development - in South Korea will still be the context of the internal development of the STRP. What South Korea can achieve through the STRP may be the barometer of what kind of sustainable development it will follow - 'sustainable development' in a proper way or 'sustainable displacement'.

Can we find a way to reconcile the benefits of industrialization by technological innovation and the productivity advance that billions of people in the developed countries including 50 million Koreans who are enjoying with the inconvenient truth of ecological unsustainability and unequal exchange through what we call 'sustainable development'? Regardless of the answer, if we try to pursue such reconciliation within the concept of sustainable development, it will be reasonable to exhaust every aspect of it to the extent of their potential. If we consider the three pillars of the mainstream sustainable development

[171] Quote from Princen (2010).

discourses (environmental, economic and social), what pillar is the least researched? If we look at the global ethical trilemma (prosperity, equity, and ecological sustainability), what aim is the least pursued? The social aspect and the aim of equity need to be operationalized further.

There is a way that we know whether such 'social' emphasis and equity aim are taken in the path of sustainable development or not. Instead of reading in an ordinary article in New York Times such as

> "Economic **growth** in the United States picked up in the last quarter in the latest **encouraging sign** that the recovery, while painfully slow, had not stalled. Consumers **spent more**, especially on health care and utilities, and businesses invested more, in software and vehicles among other items, **spurring the fastest growth in a year**. The nation's total output of goods and services **grew at an annual rate of 2.5 percent** from July to September, almost double the 1.3 percent rate in the previous quarter, the Commerce Department estimated on Thursday" (Dewan 2011:, emphasis added).

We may find ourselves speaking differently in our ordinary language in a quite monotonous tone as follows.

> '**Ecological footprint (EF)** per capita in South Korea **fell** three quarters in a row in the last year while the **SHDI (Sustainable Human Development Index)**[172] remained steady', announced the prime minister on Monday. This is not an unexpected result, considering the fact that, the **annual OECD report on the trends**

[172] The HDI stands for Human Development Index, which is developed by UN to measure three dimensions of the country level well-being status. The three dimensions are 1) life expectancy at birth, 2) education index (mean years of schooling and expected years of schooling), and 3) a decent standard of living [GNI per capita (PPP US$)] (United Nations Development Programme. 2011). Although it is one of the most broadly used alternative indicators instead of GDP per capita to depict the level of human development, there is no consideration of sustainability in it. In order for HDI to reflect sustainability concept, Hermele (2010) proposes SHDI (Sustainable HDI), which combines three indices - 1) education, 2) PPP, and 3) sustainability (as the relative performance of a country in terms of ecological footprint).

> **of global displacement and sustainability**, published six months ago, ranked South Korea at the top of the decrease rate of the **ecological displacement**.

7.7 The End of the Journey to the STRP – the Beginning of the Questions on Sustainable Development

The starting point of this study – the question of 'is the STRP sustainable?', when being reflected at the vantage point of conclusion, is not even a question properly asked in terms of sustainable development. A part of the conclusion of this study is rather about how to begin the search for a proper way to ask questions on sustainable development. For example, as to the meanings of sustainable development to the individuals we may ask how resilient their livelihood is (sustainable development as 'resilient livelihood') or what status their quality of life is (sustainable development as 'quality of life') as in the Secion 5 in this study, whereas as to the unsustainable consumption of our life we may ask what are the epigenetic mechanisms and processes to construct such unequal exchanges (displacement) as shown in the case of South Korea.

As revealed in this study, although the villagers in *Gyehwa*-township or the Koreans in general are well aware of the importance of sustainable development issues (like the green growth of the government or the environmental awakening during the STRP), at the same time, they have been enjoying the benefits from their roles played in the global dynamics of unequal material flows. **Better life from injustice for which the individuals cannot be accountable**. That is the interlim settlement of accounts of the STRP or in general, of the economic development in South Korea for the last half century.

Can I begin to ask a proper question on sustainable development now? Can I declare

that the definition of sustainable development is the arrival of the time when we cannot sustain any more the ‘better life from injustice for which the individuals cannot be accountable’? Can I declare that the birth of sustainable development is the acceptance of the **aging of ‘development’** as we have known along with the familiar human experiments like ‘industrialization’, ‘modernization’ or ‘enlightenment’? The payment for such ‘better life’ of the villagers in *Gyehwa*-township or the Koreans – for instance, the death of the mudflats – has been made in full? At the end of the journey to the STRP, I realize that the questions on sustainable development have never been asked properly yet. The giant structures of the STRP are waiting for the beginning – the beginning of the questions on sustainable development.

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APPENDIX A

Questions for the Personal Ecological Footprint (PEF) Test

Food

How often do you eat meat?

(1) Never
(2) Infrequently (once every few weeks)
(3) Occasionally (once or twice a week)
(4) Often (nearly every day)
(5) Very Often (nearly every meal)

How often do you eat fish?

(1) Never
(2) Infrequently (once every few weeks)
(3) Occasionally (once or twice a week)
(4) Often (nearly every day)
(5) Very Often (nearly every meal)

How often do you eat eggs, milk and dairy?

(1) Never
(2) Infrequently (once every few weeks)
(3) Occasionally (once or twice a week)
(4) Often (nearly every day)
(5) Very Often (nearly every meal)

How much of the food that you eat is grown or produced in South Korea?

(1) All the food I eat is from South Korea
(2) About three quarters
(3) About half
(4) About one quarter
(5) Most of the food I eat is grown outside of South Korea (6) I do not know

Goods

How much do you spend per month on clothing, footwear and/or sporting goods purchase?

(1) Not much - maybe some T-shirts and socks (or about 50,000 won a month)
(2) New pants and shirt (or about 100,000 won a month)
(3) New pants, running shoes, a couple shirts, socks and underwear (or about 150,000 won a month)
(4) I keep up to date with all the latest fashion trends (or about 200,000 won a month)

How much do you spend on new household durable goods (furniture, household appliances)

in a year?

(1) Less than 150,000 won
(2) About 300,000 won
(3) About 500,000 won
(4) More than 1,000,000 won

How much do you spend per month on new household goods (garden tools, goods for routine

household maintenance, etc.)?

(1) Less than 30,000 won
(2) About 70,000 won
(3) About 100,000 won
(4) More than 150,000 won

How much do you spend per month on home entertainment, personal computer equipment

and electronic gadgets?

(1) Less than 50,000 won
(2) About 100,000 won
(3) About 150,000 won
(4) More than 200,000 won

How often do you buy new books, magazines and newspapers for your household?

(1) About 5,000 won or less per month

(2) About 15,000 won per month
(3) About 30,000 won per month
(4) About 50,000 won per month
(5) About 100,000 won per month or more

Shelter

What kind of home do you live in?

(1) Detached house
(2) Tenement-house
(3) Apartment
(4) Other
(5) I do not know

How many people live in your household?

(1) 1 person
(2) 2 people
(3) 3 people
(4) 4 people
(5) 5 people
(6) 6 people
(7) 7 or more people

What is the size of your home?

(1) Studio or one bedroom apartment - 550 square feet (51 square meters)
(2) Two bedroom apartment or small house - 550 to 1050 square feet (51 to 100 square meters)
(3) Two or three bedroom apartment or house - 1050 to 1600 square feet (100 to 150 square meters)
(4) Three or four bedroom home - 1600 to 2200 square feet (150 to 200 square meters)
(5) Three or four bedroom home - 2200 to 2700 square feet (200 to 250 square meters)
(6) Four or five bedroom home - 2700 or larger (250 square meters or larger)

What do you typically spend per month on electricity for your home?

(1) Less than 30,000 won
(2) About 50,000 won

(3) About 80,000 won
(4) About 100,000 won
(5) More than 150,000 won

What do you typically spend per month on natural gas for your home?

(1) Less than 30,000 won
(2) About 50,000 won
(3) About 80,000 won
(4) About 100,000 won
(5) About 120,000 won
(6) I do not know

Mobility

How far do you travel by car each day (as a driver or passenger)?

(1) I never ride in a car
(2) 1 - 40 km
(3) 40 - 100 km
(4) 100 - 150 km
(5) 150 - 240 km
(6) 240 km or more

What is the size of the engine for the car you travel in most often?

(1) I do not know
(2) Small compact car (under 1,000 cc)
(3) 1001 - 1500 cc
(4) 1501 - 2000 cc
(5) 2001 - 2500 cc
(6) Over 3000 cc

How many passengers do you usually carry?

(1) 1 - 2 passengers
(2) 2 - 3 passengers
(3) 3 - 4 passengers
(4) 4 - 5 passengers

How far do you travel by public transit each week (bus, rail or subway)?

(1) 0
(2) 1 - 10 km
(3) 10 - 40 km
(4) 40 - 100 km
(5) 100 km or more

How many hours do you fly each year?

(1) I never fly
(2) 2 hours round trip (the return distance from Seoul to Jeju)
(3) 8 hours round trip (multiple domestic flights)
(3) 12 hours round trip (the return distance from Seoul to China or Japan)
(4) 25 hours (the return distance from Seoul to USA)
(5) Greater than 25 hours (multiple international flights)

APPENDIX B

The Questions for the Semi-Structured Interview

Category – I (sustainable development***-Indicators)***

i) Anthropo-Wealth: renewable resources, real estate, CPR (Common Pool Resource), TEK (Traditional Ecological Knowledge), governmental or social transfer (e.g., farming support, selection and support of future agriculturalists, tax-free fuels), social welfare (insurance and pension), vegetable gardens, the fisheries compensation for the STRP, the allowance from the children.

ii) Natural Wealth: ecological services (the mudflats), marine products (fish, shells, salt)

iii) Direct Environmental Conditions: regional surroundings, soil, atmosphere, pollution, biodiversity (the mudflats)

iv) Indirect Environmental Conditions: the effects of externalities, the contribution by the local people to the global environment

Category – II (Well-being Indicators)

i) Material Well-being: Anthropo-Wealth related, income, consumption

ii) Non-material Well-being: health, education, personal activities, political voice and governance, social connections and relations, economic insecurity and environmental insecurity, inequality, environmental conditions (the present and the future)

GLOSSARY

Blinding Effect of Displacement When displacement occurs, the advantaged hardly feel responsible for the suffering of the disadvantaged due to the spatial or temporal distance. This is called the blinding effect of displacement.

Community Hall Also called as ‘village hall’ or ‘senior citizen (community) center. Most of the communal activities in rural area take place in this place.

Displacement A phenomenon in which the wealth or powerful shift the environmental problems and costs to the poor or weak across space or across time.

District The middle level of the administrative divisions in South Korea. A district usually has a population of 50,000 or below.

EF Ecological Footprint. A measure of human demand on the Earth's ecosystems. It is a standardized measure of demand for natural capital that may be contrasted with the planet's ecological capacity to regenerate. One of the strengths of Ecological Footprint as an SDI (Sustainable Development Indicator) is the fact that it expresses both the demand (human consumption) and supply (biocapacity) aspects of the concerns of sustainable development in a single universal unit – gha (global hectare), which makes it simple and intuitive.

Ecological Footprint per capita The average Ecological Footprint value of an individual in a country. It is calculated as the Ecological Footprint of a country devided by the total population of the country.

Experiencing Mudflats (*Gae-Ppul-Che-Hum*) A type of eco-tourism utilizing the mudflats. Tourists experience tideland eco-system and catch clams within a limited area of mudflats.

GFN A nonprofit organization that was created by one of the two original developers of the Ecological Footprint concept, Mathis Wackernagel. http://www.footprintnetwork.org

gha Global hectare. Unit of measure for Ecological Footprint. The global hectare is normalized to the area-weighted average productivity of biologically productive land and water in a given year. There were 13.4 billion global hectares of biologically productive land and water on this planet in 2005.

GTRP The Gyehwado Tideland Reclamation Project (1963 – 1977). Also called as 'Dongjingang Tideland Reclamation Project'. The most of the current rice field in *Gyehwa*-township was created by the GTRP.

KRC The Korean Rural Community Corporation

KW Korean Won. The currency in South Koera. The exchange rate used in this study is '1,000 KW = $ 1'.

LEI Living Environment Improvement. Also called as 'Rural Settlement Development (RSD)'. A scheme for rural development of South Korea in the 1990s.

Mudflat A typle of weland ecosystem in the intertidal area of the western and southern coast in South Korea. Salt marsh.

Pavillion A small public building which functions a gathering place for villagers in summer instead of the community hall.

PEF Personal Ecological Footprint. Ecological Footprint of an individual. PEF is calculated by surveying the individual's life style composed of consumption components such as goods and services, food, housing, and mobility.

Province The highest level of the administrative divisions in South Korea. A province usually administrates the population of several millions in the area of about 10,000 km^2.

Quality of Life Economic, social, and ecological welbeing of an individual. In this study, it is regarded as the composition of natural assets (individual and community), social safety nets (family, community, and the government), and the environment.

RDPP Rice Direct Payment Program. A direct income aid program by the government of South Korea for the farmers who directly cultivate rice themselves, regardless of the ownership of the rice field.

Rebound Effect The discrepancy between the expected decrease of natural resources use by the increased efficiency (through scientific innovations or technological improvement) and the actual increase or often more than higher rate of increase than before introducing the efficiency measures.

SD Sustainable Development. In this study, it is defined as the 'decrease of Personal Ecological Footprint while improving or maintaining the quality of life'.

SDI Sustainable Development Indicator

Saemangeum The name of the expected reclaimed land and freshwater lake after the completion of the STRP. Translated to English, it means 'new millions of rice harvest'.

Sink (Environmental Sink) In ecological economics, the term 'sink' is used for the part of the environment that receives the waste flow of the throughput and may be able to regenerate the waste through biogeochemical cycles back to usable sources.

STRP The Saemangeum Tideland Reclamation Project (1991 -).

The Commons Common-pooled resources (CPRs). They are resources that are owned in common or shared between or among communities populations. In this study, the mudflat is singled out as a primary type of the commons in the two townships.

Township The low level of the administrative divisions in South Korea. A township has a population of several thousands.

Village Spontaneously emergent settlement. Tens to hundreds of villagers live in a village.

WSP World System Position. The political, economic and military position of a country.

VITA

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