The Ecological Impact of the Korean Saemaul (New Rural Community) Movement, 1970–1979

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1 Introduction

Lester R. Brown (2008) argues in his book, *Plan B 3.0: Mobilizing to Save Civilization,* that South Korea is a reforestation model for the rest of the world based on the fact that South Korea was largely deforested only 50 years ago. He then points out why Korean reforestation was successful, as shown in the quotation below, making the claim that it is possible to reforest the earth based on the case of the successful rapid reforestation of South Korea:

> ***South Korea*** *is in many ways* ***a reforestation model for the rest of the world****. When the Korean War ended, half a century ago, the mountainous country was largely deforested. Beginning around 1960, under* ***the dedicated leadership of President Park Chung-Hee****, the South Korean government launched a* ***national reforestation effort****. Relying on the formation of* ***village cooperatives****, hundreds of thousands of people were mobilized to dig trenches and to create terraces for supporting trees on barren mountains.*
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> *Se-Kyung Chong, researcher at the Korea Forest Research Institute, writes, "The result was a seemingly* ***miraculous rebirth of forests from barren land****." Today* ***forests cover 65 percent of the country, an area of roughly 6 million hectares****. While driving across South Korea in November 2000, it was gratifying for me to see the luxuriant stands of trees on mountains that a generation ago were bare.* ***We can reforest the earth!*** *(emphasis is mine)* [1]

This paper starts from the seemingly miraculous success of Korean reforestation by asking two basic questions: "How did it succeed?" and "Why did it succeed?" However, this paper raises a variety of fundamental questions:

- Was it a true success, and, if so, what were inherent conditions of the success?
- Were there any problems that arose during the process in spite of the success, and, if so, what were they?

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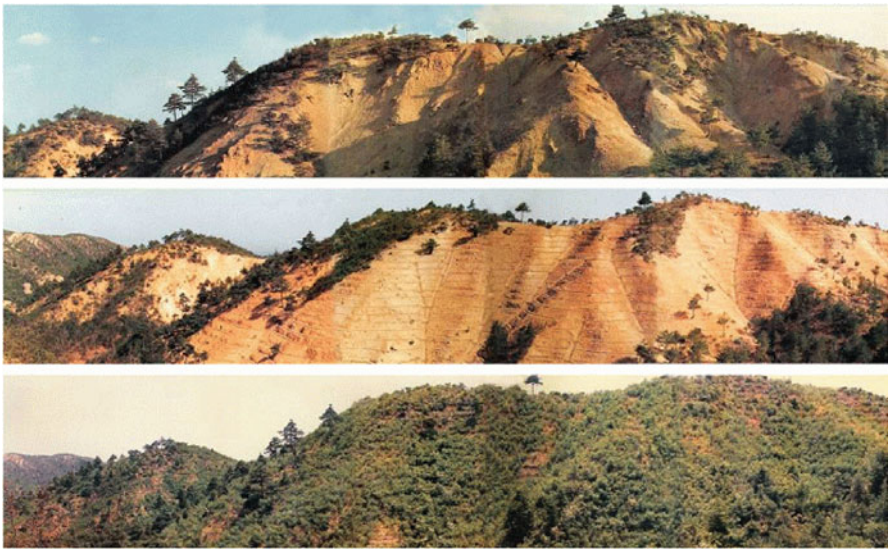

Fig. 1 Miraculous rebirth of forests from barren lands [2]

- Were the problems general or specific?
- If we want to reproduce the success today, how can we realize it while overcoming many problems?

As a result, the following research examines the possibility of utilizing the Korean's strong, top-down movement as a measure to enhance social-ecological resilience [21]. For this purpose, the paper investigates KSM, which led to the success of Korean Reforestation, focusing on the relationship between a strong, top-down approach and its ecological impact. Thus, the research expects that it can shed light on viable approaches for sustainable development, especially in developing countries (Fig. 1).

2 Research Design

2.1 Research Problem and Questions

First of all, the research assumes that every society could have different approaches to increase their social-ecological resilience. In other words, every society could have different measures to achieve contemporary sustainable development. In fact, this basic assumption arises from the researcher's personal criticism of today's sustainable development.

Contemporary, worldwide problems, such as climate change and energy crisis, require a strong interest in sustainable development. However, their basic viewpoints and practical approaches have a bias towards standardized solutions based on

engineering, which result in ignoring the inherent differences of culture and environment.

Thus, this research raises the question of whether or not the implementation of strong, top-down approaches in developing countries is effective in enhancing social-ecological resilience. For this question, the paper analyzes the extreme cases towards rapid modernization and urbanization in Korea: the Korean Saemaul Movement (1970–1979) and Korean Reforestation (1973–1978). Both cases were implemented under the authoritarian government led by President Park in the 1970s.

Interestingly, the historical reviews for the Korean Saemaul Movement (KSM) and Korean Reforestation are generally very positive. These movements have been regarded as the greatest influential governmental policies, which have contributed to national development throughout the history of the Republic of Korea [3–5]. In addition, they have become popular modernization models that have been referenced in the Third World [6, 7].

However, their ecological impacts have not been fully examined in comparison to interests regarding their economic and social impacts, even though they have fundamentally converted Korean society and nature from traditional villages with barren lands into new modern villages with forested lands. To sum up, the research problem is the 'Strong Korean Top-Down Approach and its Ecological Impact.'

2.2 Research Framework and Methodology

The framework of this paper undertakes four main steps. First of all, it identifies the background, nature, and historical progress of KSM as a strong, top-down approach through literature review and statistical data.

Secondly, the research analyzes the ecological influences of KSM with regard to resource management. For this, the paper interprets regime changes of resource management that were affected by KSM either directly or indirectly.

Third, the research focuses on the background, nature, and historical progress of Korean Reforestation as a strong, top-down approach through literature review and statistical data. Since Korean Reforestation was fundamentally rooted in KSM, the former can provide more specific and detailed information than the latter.

Finally, the paper investigates the ecological influences of Korean Reforestation, especially on a national-scale and global-scale. In other words, the research explores ambivalent impacts, such as national-scale success and global-scale consequences based on the world-system theory [8, 9].

3 Korean Saemaul Movement, 1970–1979

3.1 Brief Background on the Republic of Korea

Historically, the Joseon Dynasty (1392–1910) existed as a single, independent nation on the Korean Peninsula before Korea was under the Japanese colonial forces (1910–1945). During the Joseon Dynasty, neo-Confucianism was a national religion and ideological base for governance rules [20].

In addition, agriculture was a primary industry supporting Korean society and economy until President Park initiated the first Five-Year Economic Development Plan in 1962, which pursued rapid economic growth through industrialization. Meanwhile, Korea suffered from the Korean War (1950–1953) between South and North Korea, which completely devastated the country.

Geographically, the land area of South Korea is about 38,691 mile^2, or 100,210 km^2, which is similar to the state of Indiana in the United States. Mountainous land makes up about 65 % of the whole country, with relatively high mountains in the east area. The country has few natural resources, of which include coal, iron ore, and limestone.

Socially, South Korea has nearly 50 million people living on limited land with few natural resources. The population density is very high with approximately 1,271 people per square miles in 2010. Thus, the country is currently one of the most densely populated regions in the world.

Economically, the nation has one of the world's fastest growing economies. South Korea has impressively achieved rapid economic growth within the past 50 years. To be specific, South Korea was poorer than most of the African countries in the early 1960s. The Gross Domestic Product (GDP) per capita was only $82 at that time. However, the GDP per capita based on Purchasing Power Parity (PPP) reached $30,700 in 2011.

3.2 President Park, Chung-Hee, 1917–1979

Even today, President Park, Chung-Hee (1917–1979) is considered a very controversial figure based on his achievements as President. Some people argue strongly that he was a hero who led the Korean modernization and industrialization movement. Others condemn him as a dictator who suppressed Korean democracy and human rights until his assassination in 1979. According to numerous surveys, however, more than half of the respondents have stated that he was the greatest president throughout the history of Republic of Korea.[1] Furthermore, among all of the government policies that he implemented, KSM was considered to be the best.

[1] In President Park, Chung Hee's Internet Memorial [10], the results of numerous surveys are well summarized. Although the website is for the celebration of President Park's achievements, it provides reliable information.

Fig. 2 President Park, Chung-Hee (1917–1979) [10]

The personal life of Park, Chung-Hee is also very controversial. He was born the youngest son of the local collapsed gentry in 1917. He was later admitted to the Daegu Teacher's Gymnasium, a competitive high school for prospective primary teachers and, after graduating from the 5-year study in 1937, was a primary teacher for 3 years. He then voluntarily joined the Manchukuo Imperial Army Academy, completing his studies with top marks in 1942. He was selected for officer training at the Army Staff College in Japan, later graduating third in his class [19].

In 1945, after the end of the World War II, he went on to serve in the military of the Republic of Korea. He then became a leader of military coup on May 16, 1961, which allowed him to have absolute power for 19 years. However, he was fatally shot in 1979 by Kim, Jae-kyu, director of the Korean Central Intelligence Agency (KCIA), who had been his loyal subordinate for a long time. Presently, Park, Geun-Hye, his oldest daughter, is now the president of South Korea, taking office on February 25, 2013 (Fig. 2).

3.3 Korean Saemaul Movement as a Top-Down Approach

3.3.1 Background and Nature

In order to correctly understand the nature of KSM, it is necessary to comprehend the political climate of South Korea in the early 1970s. The local politics had been under the executive control of administrative elites in the central government since 1961 when the Park administration had absolute power [11].

Under those circumstances, the Park government proposed the Five-Year Economic Development Plans of 1962–1966 and 1967–1971, which generated remarkable economic growth that averaged 9.7 % annually for those years [12]. However, it also exacerbated the economic gap between the rural sector and urban

sector. Boyer et al. (1991) describes this point clearly as shown in the quotation below:

> ***Growth in agriculture and rural areas**, however, **lagged far behind that in the industrial sector and urban South Korea**. The average rate of economic growth during **the first five-year plan** was **7.8 percent**, but only **5.3 percent for agriculture**. The agricultural sector worsened during **the second five-year plan**, when it grew at an annual rate of **only 2.5 percent, compared to 10.5 percent for industry**. On average a rural household in 1963, but **only 56 percent of the average household income** in 1969 (emphasis is mine).* [11]

Ironically, the rural sector in South Korea was very important to the Park government. This was because it was their political base, even though Park and his planners dreamed that the Republic of Korea would become an industrial society in the near future [13], a concept that was highly associated with Park's dictatorial government. Park held three consecutive terms of office as the fifth (1963–1967), sixth (1967–1971), and seventh (1971–1975) President. Moreover, Park was chosen by the people's direct election, even though he amended the constitution of the Republic of Korea.

However, the Park government thought that their political popularity was decreasing, as they had many political opponents. Thus, Park passed the new authoritarian constitution in 1972, legitimizing his dictatorship based on the people's indirect election. The affair was called 'October Yusin,' which was derived from the Meiji Yusin, or Meiji Restoration, the catalyst of Japanese modernization in the nineteenth century. In this context, Sorensen (2011) assessed the nature of KSM as one of Park's Yusin Period strategies as shown in the quotation below:

> *The New Village Movement, begun in 1971, was designed in part to shore up **Park's rural support**, and was central to **Yusin developmental strategy**. **The New Village Movement**, in fact, can be paired with **the Heavy and Chemical Industrialization Program** as one of the two legs of Park's Yusin Period development strategy. **Park was personally and deeply involved** in the drafting and implementation of both programs (emphasis is mine).* [13]

3.3.2 Historical Progress

To briefly summarize, KSM was a political initiative launched in 1970. It is often said that it aimed to modernize the rural economy and to change the traditional and unscientific mentality of the peasants [13, 14]. In addition, it was a strong, top-down leadership driven by President Park, Chung-Hee.

As shown in Fig. 3, President Park often used to write calligraphy in order to clearly present his mottos, which included modernization, national regeneration, and development and growth. In other words, he tried to emphasize spiritual revolution as well as economic growth. In fact, his core mottos were, "We will live better, too," and "We can do it." Therefore, KSM can be interpreted as a platform for realizing national agendas according to changing situations.

According to Boyer et al. (1991), the New Village Movement is divided into two major periods, 1970–1972 and 1973–1978 [11]. During the first period, the movement started from the pilot projects of central government distribution of 335 free

Fig. 3 Korean Saemaul movement [10]

bags of cement to each of South Korea's 33,267 villages. The villages were expected to use the cement for the ten government-designated village projects comprising the Program for Village Environmental Improvement.[2]

Surprisingly, it achieved huge results far exceeding initial expectations. For example, according to the government's evaluation in July 1971, the expenditure of the equivalent of US$11 million for the cement had yielded village improvements valued at US$32.6 million, nearly three times the government's estimate. As a result, the dramatic success allowed the Park government to pursue a more systematic and planned approach to KSM.

During the period of 1973–1978, the Park government decided to expand KSM to all villages, urban areas, factories, schools, and even the military. The government classified villages into three categories according to their stages of development: undeveloped (basic), developing (self-helping), and developed (self-sufficient) villages. The main goal of the classification was for all villages to become 'developed' by 1981. Table 1 indicates how KSM was actively expanded in the 1970s.

3.4 Ecological Impact of Korean Saemaul Movement

3.4.1 Regime Changes of Resource Management

Interestingly, President Park wanted to transform the 'Traditional Village' of those days into the 'Modern Village,' which had western-style houses with gabled roofs

[2] The Program for Village Environmental Improvement became the initial thrust of KSM, expanding from ten first-year target projects to twenty projects thereafter. First-year projects for each village included (1) reforestation of nearby terrain, (2) broadening village access roads, (3) repairing and improving village dikes, (4) preparing a village compost barn, (5) deepening the village pond, (6) repairing and maintaining the pond, (7) keeping the village, ditches, and gutters clean, (8) constructing a community well, (9) exterminating rats, and (10) establishing a village laundry facility [11].

Table 1 Expansion of Korean Saemaul movement [11]

Year	No. of participant villages	No. of man days (thousand)	No. of projects (thousand)	Total investment (billion won)
1971	33,267	7,200	385	12.8
1972	35,031	106,852	1,099	132.8
1977	36,557	137,193	2,463	463.5
1979	36,271	242,078	1,788	758.2

Fig. 4 Comparisons between a Traditional House and a KSM House [10]

Table 2 Regime changes of resource management

Resource		Traditional (natural-resource-based)	Modern (industrial-resource-based)
Building material	Wall	Soil, wood, straw	Cement, reinforcing bar
	Window	Traditional paper	Glass
	Roof	Straw and grass	Slate
Fuel	Cooking	Firewood	Coal, oil
	Heating	Firewood	Coal, oil, gas
Lighting		Kerosene lamp	Electricity
Water		Well	Well pump

and punching windows. President Park and his planners regarded the 'traditional village' as a negative place with passivity, stagnation, disease, and poverty.

Figure 4 clearly reveals the difference between the two villages. They each look completely different, especially in terms of the materials used and the images of the built environments.

As a result, KSM led to the regime changes of resource management as shown in Table 2, from natural resource-based materials to industrial resource-based ones. For example, building materials were changed from soil, paper, wood, and straw to cement, glass, and reinforcing bars. Fuels for heating or cooking were also changed from firewood to coal, oil, or gas.

4 Korean Reforestation, 1973–1978

4.1 Korean Reforestation as a Top-Down Approach

4.1.1 Background and Nature

As mentioned above, South Korea has a high population density and large mountainous areas comprising approximately 65 % of the whole country. In addition, the rainfall is concentrated during the summer months of June through September. The rainfall in July alone is nearly 28 % of the whole annual precipitation. The issue of the forest has historically been very important in Korea because it provides a variety of benefits: holding water, alleviating droughts, preventing floods and landslides, providing foundation for biodiversity, maintaining air quality, and so on.

4.1.2 Historical Progress

The reforestation process has continuously been pursued since Korea was deforested by Japanese exploitation, Korean War, reckless deforestation for firewood, lack of policing, and so on. Both Table 3 and Fig. 5 indicate how passionately the Park government reforested the country. The Park government exerted strong leadership during the periods of the Pre-Reforestation (1962–1972) and First Reforestation (1973–1978). However, the achievements of the Pre-Reforestation Period (1962–1972) were not as satisfactory as those of First Reforestation Period (1973–1978).

Table 3 Historical progress of Korean reforestation [15] (Unit: area –hectare, number of trees – million)[a]

Period	Pre reforest (1962–1972)	1st reforest (1973–1978)	2nd reforest (1979–1987)	Whole reforest (1962–1987)
Total area	149,902	179,962	107,319	142,099
Timber area	63,236	59,626	56,325	60,011
Rapid growth Tree area	10,607	59,467	47,184	34,544
Fruit tree area	20,182	25,599	3,146	15,535
Fuel tree area	55,732	34,638	0	31,572
Others area	145	632	664	437
Number of trees	420	493	213	365

[a]Numbers in the figure refer to annual averages during the period

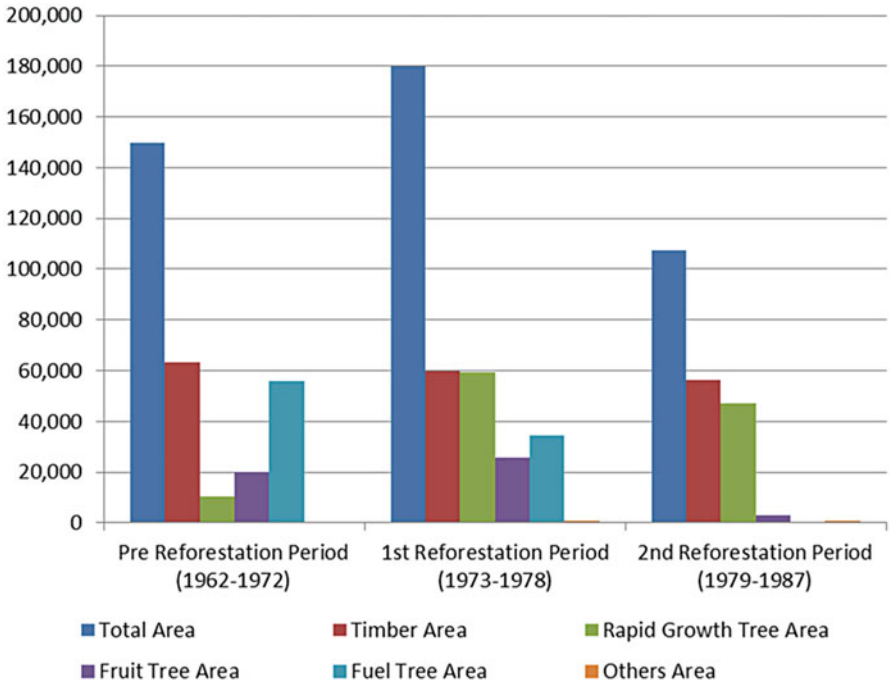

Fig. 5 Historical progress of Korean reforestation [15] (Unit: area –hectare, number of trees – million [Numbers in the figure refer to annual averages during the period])

To be specific, the Pre-Reforestation Period (1962–1972) had reforested areas and numerous trees similar to that of First Reforestation Period. However, the former focused more on fuel trees than the latter did. On top of that, most of the reforested trees in the 'Others Area' found in Table 3 were also used as firewood [16]. As a result, it was impossible that Korean reforestation took effect during the period of Pre-Reforestation (1962–1972).

On the other hand, the First Reforestation Period (1973–1978), which was very rapid and intensive, focused not on fuel trees, but on timbers or rapid growth trees. Furthermore, the 10-year plan was completed within just 6 years. This also implies that certain fundamental changes of forest utilization happened during this period, including the substitution of firewood for home use with fossil fuels.

4.2 Ecological Impact of Korean Reforestation

4.2.1 National-Scale Success

The success of Korean Reforestation is undisputed around the world. What were its inherent causes? Bae et al. (2006) argues that there were several reasons why Korean Reforestation succeeded [16].

First, President Park had powerful leadership in reforesting the whole country rapidly and fervently. He prioritized the issue of reforestation as the government's primary agenda. He monitored the progress continuously and thoroughly, mobilizing public officers as well as encouraging people.

Second, a variety of governmental ministries cooperated closely with each other in order to realize President Park's goal. Initially, the Ministry of Agriculture and Forest was in charge of the reforestation before the First Reforestation Period (1973–1978). However, since the result was not satisfactory, President Park ordered the Ministry of Home Affairs to undertake the task. The Ministry of Home Affairs was one of the most powerful government ministries at that time because it included all administrative public officers, such as the police and the prosecuting office. As a result, Korean reforestation was executed under the ministry's management and supervision.

Third, the citizens enthusiastically participated in the reforestation process [17]. Although the Park government was a fearsome authoritarian regime, the public actively joined the movement. In those days, Korea had two holidays for the reforestation: Tree-Planting Day (April 5) and Tree-Culturing Day (First Saturday of November). In addition, there was a specific period when the government motivated all people to plant trees (March 21–April 20). Even today, planting trees is thought to be important and meaningful to Koreans. For example, many leaders enjoy planting trees in important public places to commemorate taking up or retiring their posts.

Finally, the continuous economic growth in Korea in the 1970s was a very important factor that resulted in substantive effects on Korean reforestation. The Park government had enough funding to support the task of reforestation. Likewise, the citizens generally had increasing disposable incomes because it led to fundamental changes of life styles, so called from traditional to modern. However, the most important factor in Korean reforestation was the substitution of firewood for home use with fossil fuels such as coal, oil, or gas.

Table 4 shows the changes in cooking fuel consumption during the period from 1970 to 1990. In 1970, firewood and coal were the most important fuels for cooking. At that time, coal was mainly used in urban areas, while firewood was used in rural areas. However, the use of firewood as cooking fuel has decreased continuously, reaching 2.5 % of the entire consumption in 1990. Meanwhile, the use of coal hit its peak of 65.7 % in 1980, followed by a decrease to 10.3 % in 1990. This was because the use of gas became the dominant cooking fuel in South Korea.

4.2.2 Global-Scale Consequences

Along with national-scale success, Korean Reforestation created global-scale consequences. Currently, South Korea has a very low domestic self-sufficiency in timber, even though the figure has increased from 5.7 % in 2000 to 15 % in 2011 [18]. Hardwood, according to the 2011 statistical data, has 51.6 % domestic self-sufficiency, which reached 4.45 million m^3 [18].

Table 4 Changes of cooking fuels consumption [16] (Unit: number of households)

Year	1970	1975	1980	1985	1990
Coal	3,016,873	4,330,663	5,238,919	4,612,344	1,166,223
	(52.1 %)	(64.2 %)	(65.7 %)	(48.2 %)	(10.3 %)
Oil	37,907	58,481	200,619	782,345	253,297
	(0.7 %)	(0.9 %)	(2.5 %)	(8.2 %)	(2.2 %)
Gas	11,481	50,764	482,910	2,526,366	9,298,171
	(0.2 %)	(0.8 %)	(6.1 %)	(26.4 %)	(81.9 %)
Electricity	4,316	16,583	22,640	139,060	307,690
	(0.1 %)	(0.2 %)	(0.3 %)	(1.5 %)	(2.7 %)
Firewood	2,720,275	2,289,302	1,794,113	1,406,105	280,687
	(47.0 %)	(33.9 %)	(22.5 %)	(14.7 %)	(2.5 %)
Others	1,914	4,557	230,000	105,141	48,472
	(0.0 %)	(0.1 %)	(2.9 %)	(1.1 %)	(0.4 %)
Total	5,792,766	6,750,350	7,969,201	9,571,361	11,354,540
	(100.0 %)	(100.0 %)	(100.0 %)	(100.0 %)	(100.0 %)

Table 5 Korean foreign-dependence of energy and oil [18]

Year	1970	1980	1990	2000	2005
Dependence of energy (%)	47.5	73.5	87.9	97.2	96.8
Dependence of oil (%)	–	61.1	53.8	52.0	44.4
Cost of energy import (billion $)	–	6.59	10.93	37.58	66.7

In addition, South Korea has an extremely high degree of foreign dependence on energy. Table 5 shows the degree to which South Korea has depended on foreign energy, especially fossil fuels exported mainly from the Middle East. The dependence has continuously increased from 47.5 % in 1970 to 96.8 % in 2005. According to the 2011 statistical data, the total amount of energy import reached 262.6 million TOE (Ton of Oil Equivalent), which came to $121.6 billion of energy import [18].

As a result, the absolute foreign dependence on energy and resources has pushed South Korea into the rigidity trap, decreasing Korean social-ecological resilience. In fact, this phenomenon results from the distinct Korean economic structure, which is heavily dependent on international trades. Since South Korea has few natural resources and a small economic market, the Park government concentrated on export-centered economic growth. This key economic policy has been sustained since it was first established in the 1960s.

Interestingly, the energy imports reached 32 % of entire imports in 2010, which were equivalent to the total exports of Korea's main manufacturing industries, such as semiconductors, automobiles, and shipbuilding. In other words, Samsung Electronics, Hyundai & Kia Motors, Daewoo Shipbuilding are earning dollars to buy oil and gas from the Middle East.

5 Conclusion

This research investigated the 'Strong Korean Top-Down Approach and its Ecological Impact' with two extreme cases: the Korean Saemaul Movement and Korean Reforestation. For this research, the paper assumed that every society could have different approaches and measures to enhance their social-ecological resilience, as well as achieving contemporary sustainable development. The research, then, conducted a literature review and utilized statistical data under the research framework based on the theories of historical ecology. The research reached following conclusions.

First of all, KSM was a strong, top-down approach to modernize the rural economy and change the traditional and unscientific mentality of the peasants. Although the movement provided construction materials or support grants, it was basically a spiritual platform for national agendas to be implemented according to changing situations.

Second, KSM affected regime changes of resource management from natural resource-based materials into industrial resource-based materials.

Third, the national-scale success of Korean Reforestation resulted from the strong leadership of President Park, cross-sectoral support by various governmental ministries, the public's passionate participation, continuous economic growth, and the substitution of firewood for home use with fossil fuels.

Fourth, the global-scale consequences of Korean Reforestation resulted in an extremely high foreign dependence of energy and resources, which have led South Korea to fall into the rigidity trap, decreasing the social-ecological resilience. In fact, this phenomenon results from the distinct Korean economic structure that is heavily dependent on international trades caused by few natural resources and small economic market.

Finally, it was meaningful to investigate the positive impact of the Korean strong, top-down approaches and to figure out their accompanying adverse effects according to both the national-scale and global-scale.

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