

## Ecological Modernization as a Policy Idea, its Practice, its Future and its Origin

NAGAO Shinichi\*

East Asian countries including China and south Korea have introduced environmental-friendly development strategies as early as in the beginning of this century. These phenomena confirm the influence and persuasive power of the idea, even though it still has no proper name and called “ecological modernisation”, “ecological structural change”, “green growth strategy”, etc., according to authors’ different perspectives. Whatever be called, ecological modernisation as defined, not as the harmonization of environmental concerns and economic growth based upon cost benefit analysis of environmental economics, but as economic and social progress through environmental protection, is the most successful policy idea in recent decades. This paper will describe its birth and development in west European nations especially in Germany and discuss its diffusion in the world. Then it will analyse the success and limitation of the strategy concerning welfare and income distribution in contemporary market economy. Ecological welfare, the idea of welfare defined by ecology and welfare produced by ecology will be proposed as the solution of the problems. The origin of the idea in the history of economic theory from the 18th century to the late 20th century will be treated briefly in the concluding chapter.

**Keywords:** Development strategy, Ecological welfare, Ecological modernization, History of Economic theory

---

\* Emeritus Professor, Nagoya University

## I. Introduction

From the end of last century, many countries included “environmental right” or the obligation of the state to protect environment in their constitutions. Germany added clause 20a in 1994 and Italy, Switzerland and Spain did the same amendments. In 2019 China made several amendments to its constitution. International media focused their attentions on the clause that enabled current leader of Chinese Communist Party to strengthen his power. However, there was another amendment that change the former clause, stating “to promote material civilisation, harmonious development of political civilization and spiritual civilization, to build wealthy and strong, democratic, civilized socialist state (推动物质文明、政治文明和精神文明协调发展,把我国建设成为富强、民主、文明的社会主义国家)” to the statement “to promote harmonious development of material, political, spiritual, social and ecological civilization, to build a wealthy and strong, democratic, civilized, harmonious, beautiful, socialist modern powerful country, to realise the great renaissance of Chinese nation (推动物质文明、政治文明、精神文明、社会文明、生态文明协调发展,把我国建设成为富强民主文明和谐美丽的社会主义现代化强国,实现中华民族伟大复兴)”.

The amendment of the constitution defined the 5th goal of modernisation of socialist China as “ecological civilisation”. This concept is assumed by the party leadership to characterize Chinese socialism. Policy ideas placing ecology in the centre of social and economic progress have developed mostly in west-European countries, especially in wealthy small states and Germany where economy governed more or less by “social market economy”. The economic governance of these countries today therefore might be characterized as “ecological social market economy”.

The idea of eco-social development through environmental protection, sometimes called “ecological modernisation”, emerged after the economic crisis of developed industrial countries in the 1970s when employment became major political

issue again. From the 1960s to the 1970s, arguments were mostly concerned with the harmonization of “economic growth” and “environment”. In the 1980s however, emphasis moved from “harmonisation with environment” to the “progress through environment”. The idea can be traced back to academic literature and political programs of north European countries in the 1960s and the early 1970s. Arthur P. J. Moll described theoretical development in Germany in the early 1980s as follows: firstly, environmental economist Joseph Huber proposed the idea of ecological modernization as the fundamental solution to environmental problems. Furthermore, Huber argued, it would contribute to the modernisation of industries by means of resource-saving innovations, hence enhance a country’s international competitiveness. Secondly, political scientist Martin Jänicke stated that ecological modernization had to be accompanied by “social innovation”, therefore it led to political reforms and the reconstruction of welfare state. Sociologist Moll himself added the prospect to the concept that ecological modernization paved the way to new social evolution<sup>1)</sup>.

The Chinese constitutional amendment of “ecological civilisation” is an evidence of the diffusion of the very idea among east Asian countries. The introduction of the concept into Chinese policy occurred as “Green development strategy” in the beginning of the 21st century, earlier than the United States’ “Green New Deal” of Obama administration<sup>2)</sup>. Another example is “Green growth Strategy” of south Korea adapted in 2008, several months before President Obama was elected<sup>3)</sup>. These phenomena confirm the influence and persuasive power of the idea, even though it still has no proper name and called “ecological modernisation”, “ecological structural change”, “green growth strategy”, etc., according to authors’ different perspectives. Whatever be called, ecological modernisation as defined, not as the harmonization of environmental concerns and economic growth based upon cost benefit analysis of environmental economics, but as economic and

social progress through environmental protection, is the most successful policy idea in recent decades. It keeps on producing policies such as “A European Green Deal” in 2019<sup>4)</sup>, new “green revolution” policies of Biden administration in the United States, etc.

## II. Ecological modernization: its birth and development

Ecological modernization is the policy idea elaborated by cognitive and policy communities of northern Europe and Germany in the 1980s. The eco-socio-economic developments in various countries prompted by the policy are also called ecological modernization. However, the expressions of same phenomena are varying since there is no consensus of the terminology for such a new and fast evolving idea, policy and their outcome.

The aim of ecological modernization strategy is to put environmental issues at the centre of socio-economic development of a society as “the development of economy and society through environmental protection” and to overcome older idea of “harmonization of economic growth and environmental protection”. In the late 20<sup>th</sup> century, it has been widely accepted in the west European countries. During the last two decades it has diffused, at least as a policy idea, throughout the world and several governments in Asia, South America and Africa have formalized their own strategies according to the idea.

Martin Jänicke gave one of the classical definitions of ecological modernization in the early 1980s. The intensive usage of scarce resources not only causes environmental destruction, but also increases economic costs. Investment, not in labour saving technology, but in energy and resource saving technology, is essential.

“Ecological modernization based upon the changes in technology and methods gives the means to save both ecologically and economically. Here lies a great opportunity of employment. To avoid the complete destruction of the basis for the life and production in the future, the switch from

wasting technology to saving technology is needed. Who does not create this technology today will have to import it in the future.”<sup>5)</sup> But technological modernisation of existing industries is not enough. “In the long run, structural change into post-industrial society is inevitable.”<sup>6)</sup> “Reform strategy will confront the power structure of existing industries. Therefore, technological innovation requires social innovation.”<sup>7)</sup>

The idea of ecological modernization was immediately put in practice in Germany, especially as the policies of newly born Green party. Its political success in the early 1980s prompted traditional parties to absorb Green’s idea and soon it spread across policy communities. SPD’s Berlin Program in 1989<sup>8)</sup> stated, for instance, the need of “ecological renewal (die ökologische Erneuerung)”, “ecological social market (die ökologisch-soziale Marktwirtschaft)” and advocated that it would realise the modernization of Germany based upon “ecological structural change of industrial society (der ökologische-Umbau der Industriegesellschaft)”. These trends culminated in the policy of Red-Green coalition born in 1998.

Similar ideas can be found in the policy documents of EU published after 2000. “Lisbon Strategy” adapted in 2000 and its accompanying policy statements acclaimed the need of green investment and green technology to strengthen EU’s industrial competitiveness and to create new jobs. Succeeding strategy of EU, “Europe 2010” openly stated that EU would not regard GDP growth as a policy target in economy<sup>9)</sup>. Environment, quality of life, as well as job-creations and competitiveness of EU in global market had to be achieved through structural change of industrial society towards knowledge economy, innovations and ecological modernization<sup>10)</sup>. Furthermore, the idea defused among world policy communities, such as “Green New Deal” in 2008 of Obama administration in the U.S.A..

Ecological modernization is a comprehensive strategy including both environmental and economic aspect<sup>11)</sup>. From the viewpoint of economy,

it was expected to promote five features of economic progress: 1. cost efficiency in energy and resources, 2. employment, 3. innovation, 4. structural change in industries and 5. economic growth in term of GDP. However, except the first two, latter three are not unconditional. To realise ecological modernization, the shift from labour-saving, resource and environment intensive technologies to resource and environment saving one is needed. Welcomed innovation is not for GDP growth, but ones for the paradigmatic change in industries. Structural change is also welcomed and promoted if it will reduce energy and natural resource in input and emissions in output. Economy can and must grow under ecological modernization. But evidences from Japan in the 1980s and South Korea and China in recent years demonstrated that ecological efficiency of industries could be cancelled by high-growth rate of GDP. Ecological modernization promotes environmental protection when GDP growth is relatively low as in west European countries in recent years. Then a low growth of GDP must be presupposed. All these features originated in the fact that economy is no longer an independent activity in the age of global ecological crisis and must be included in ecological concerns. Ecological modernization is a market-oriented policy response to the crisis.

### III. Ecological modernization: its diffusion to east Asia

From the beginning of the century, the diffusion of ecological modernization became global and observed beyond the political and cultural boundaries. The most phenomenal development is its literally or de-fact acceptance of east Asian countries which have developing strong industrial economy. Chinese global success in eco-related industries is its best evidence.

However, these east Asian countries have different ways of governance from social market economy where the idea of ecological modernization was originally born. Successful economies in east Asia such as China, south Korea, Japan, Singapore

and Taiwan have state-led governance, though the ways of intervention are not identical. South Korean economy is dominated by 재벌 (jaebeol) which is run by founder's family and has close ties with strong central government. Japanese economy can be characterized as "corporate corporatism"<sup>12)</sup>. Singapore is a kind of free-market socialism and even in Taiwan, where SMEs have greatly contributed to the competitiveness of the country, state's role has been not negligible<sup>13)</sup>.

Chinese economy is a socialist market economy. Though its basic functionality depends on the market mechanism, it is governed by the mighty centralized state substantially built up and supported by CPC. Japan, as well as Singapore, was notorious for its "one-party system". Japan experienced several changes of government from the 1980s but is still governed by the same party which promoted its "economic miracle" in the 1960s. South Korea and Taiwan developed two party system after democratisation but their states' power remains strong enough to define their economic performances. Chinese state-owned companies still control large proportion of her economy and the whole of her land is owned by the state. Oligopoly and close relation between business and the state are common in the market economy of South Korea and Japan.

Literatures in political economy categorized social market economy as "coordinated market", which is to be located in between state-led economy and free market economy of the United States and United Kingdom<sup>14)</sup>. As far as the governance of national economy is concerned, east Asian industrial nations such as China and south Korea are far apart from social market economy. It is therefore natural that following questions will be posed:

- (1) Does ecological modernization which developed in countries governed by social market, really adapted in state-led economies of north east Asia?
- (2) If so, why this happened?

The answer to the questions would be as follows. On the one hand, ecological modernization

in south Korea and China is, if it is to be seen as such, the imperfect adaptation of the idea into their policies in the following senses: The failures of environmental protection in some policy areas and the existence of cancelling effect of high economic growth against environmental policy, especially in China. The failure of the realisation of the 3rd stage of environmental policy, that is, the crucial role of civil society both in policymaking and policy implementation. The European concept of multi-level governance of environment is hard to implement in these countries, too.

On the other hand, both countries give good examples of ecological modernization. Firstly, the increase of economic competitiveness concerning “3rd” or “4th industrial revolution” is observed in these countries, such as the development of IT industry and information society in south Korea and green industries, solar panel, EV etc., in China. This could be interpreted as an example of plural paths of ecological modernization of a country under global environmental governance, according to the stage of industrial development and historical, institutional backgrounds of countries. Secondly, it is remarkable that ecological modernization as a policy idea has been introduced into these Asian states earlier than some of west-European countries and the United States. Political ideas have their own life. Once they were introduced into policy arena, even if the implementation were rather a failure, they could be revived and realized by the hands of different actors, as the ambitious environmental programs of Brand administration eventually paved the way to the creation of green politics in west Germany<sup>15)</sup>. Therefore, although half-done or selective introduction of the idea may have further implications in the future, such as increasing role of civil society.

The causes of the early introduction of ecological modernisation to east Asian countries could be explained as follows. Firstly, the emergence of global regime of ecological modernization through international competition in world market play an important role in the diffusion. Countries on the earth are on different stages of industrial

development. Hence developed, emerging and developing countries have different ways of economic governance, then several types of the governance of ecological modernisation could emerge. Whether these types will converge in the future is a question have to be answered. State-led governance in east Asian countries has an advantage of foreseeing future development of global market and implementing policies with long-term perspectives. Successful east Asian countries have, more or less, the characteristics of “developmental state”. It is natural for such a state to pick up the latest development of policies in advanced industrial nations to maintain and increase its national competitiveness.

It is worth mentioning here that MITI (Ministry of Industry and Trade) of Japan, at its height of its industrial leadership, published a famous policy report, *Long-term Vision of Industrial Structure*, in 1974 and inspired some of the advocators of ecological modernization in west European countries<sup>16)</sup>. The report says that today welfare and the quality of life become urgent demand of Japanese citizens. The transformation of industrial structure towards one that is based upon energy and resource saving technology is needed. This change will result in pro-environmental, ecological sound industrial structure. Manpower, Japan’s most important and high-quality national asset, can promote creative innovation and this leads to the establishment of high-tech, healthy information society.

Secondly, political competition among states is also important for the diffusion of the idea. Once the global governance of environment has been put in place, competition begins between states which seek leadership to increase their influence over global society and to reinforce its power over their citizens using the success in global political arena. Both South Korean conservative government and Chinese communist leadership give good examples of the mechanism. However, as mentioned above, political idea has its own life. It can step out the boundary set by its founders in the future.

Although the adaptation of ecological

modernization in east Asia was not perfect as often characterised as “weak” ecological modernisation” compared to “strong” one in western Europe, introduction of the idea into the policy communities in these countries really happened. The diffusion of ecological modernization in east Asian countries could be explained by economic competition in near-future world market and political competition among states concerning global political issues. This could be an evidence that ecological modernization as a world regime of global environmental governance, though partially, begins to be working.

#### IV. Ecological modernization: its success and limitation

Ecological modernization has brought several positive results such as energy efficiency in industries, employment in related areas, fast growth of environmental industries and renewable energy, and above all, sound governmental strategies in non-European countries and success of their eco-friendly industries in world market. Insufficiencies of the strategy has also emerged and being discussed recently<sup>17)</sup>. The distribution of co-benefits of ecological modernization tends to be asymmetric. There are sectors of industry where ecological modernization brings damages and therefore creates resistance against environmental policies. The cost of ecological modernization diffuses disproportionately and sometimes upon the shoulders of low-income groups in a society.

Two factors can explain these problems: market led growth under low birth rate and Mathew effect. Economic growth led by market mechanism naturally creates asymmetric distribution of its fruits. Adam Smith recognised this relationship well and yet recommended market led growth to policy makers, because in an unprecedented high growth rate that England was then experiencing, even the lowest income group in industrial population was able to enjoy increase in real wage, although Gini coefficient of a nation increased, too<sup>18)</sup>. Under a low growth economy that

coincided to low birth rate, market led growth tends to increase Gini coefficient without improving real wage of middle- and lower-income groups. Ecological modernization that depends mostly on the function of market therefore cannot bring fair distribution of cost and benefit among population.

In the 1990s, reforms of welfare system introduced into west European countries. Its basic idea, sometimes called “social investment”, was to link welfare provisions to the upgrading of the skills of unemployed population. It was a market-oriented reform to make welfare spending contribute to economic growth. Positive results such as the increase of employment have been achieved, but it has a negative side effect called Mathew effect, that is, the rich become richer and the poor remain poor. The same can be said about ecological modernization.

Following five themes must be discussed to consider probable further development of ecological modernization; the need of ecological welfare; the complementarity and selectivity of environmental protection and welfare; the low growth regime of industrialised economy; the future of financial capitalism; stationary state society.

##### 1. Ecological welfare: welfare defined by ecology and welfare produced by ecology

Recent years policy development trying to integrate ecology and welfare has been observed both in Europe and Asia. Along with minimum wage policy to ensure minimal standard of living of citizens, Moon Jae-in government of south Korea has introduced “energy welfare” scheme to counteract side effects of energy policy<sup>19)</sup>. Both policies have been implemented in Northern European countries. China is introducing new policies to eliminate poverty and some of which are integrated into “ecological civilisation” strategy<sup>20)</sup>.

There are evidences proving that stable and convenient life of people is the most important factor to promote environmental protection<sup>21)</sup>. Ecology on the other hand improves the living standard of population. There is complementarity between ecology (long term interest of human race)

and welfare (short term interest of people). On this ground, welfare provisions must be reconsidered as “ecological welfare”, the means to establish social basis for environmental protection. As economy was integrated into ecology in the late 20th century, now welfare must be integrated into ecology, because all these contribute to the same interest of human race.

Global environmental protection (value 1) and the welfare of people (value 2) are basic values that every state, either democratic or dictatorial, secular or religious, should accept when they are not completely against the current state of scientific knowledge. Effective environmental protection and natural resource management are the basis for the survival of human race on the planet (value 1). No state can exist when its citizens live in intolerably miserable conditions (value 2). Therefore, the aims of ecological welfare can be universally shared by all nations.

## **2. Complementarity and selectivity of environmental protection and welfare**

Environmental protection itself contributes to the quality of life. It also gives extra resource for welfare, releasing costs to compensate the damages done to environment and human life. Ecological modernisation creates jobs, technological innovations, and profit that can be used as a resource of welfare. The welfare of citizens (sustainable high standard of living, job security, health insurance, pension, education, housing, medical care, etc.) is the most important condition for effective environmental policy. Thus, the complementarity between environment and welfare is the basic principle of ecological welfare.

However, many individual cases, these two contradict with each other. For instance, the effects of environmental policy and ecological modernisation are more favourable to certain industries and population than others. They sometimes become harmful to certain sectors of industry and create economic divide. The policies promoting GDP to create jobs and to secure the resource of welfare, if they implemented without

any concerns to environmental protection, can damage environment. The role of the guardians of ecological welfare, public authorities and civil societies, is to coordinate and to harmonize the effects of these two at their origins. Under ecological welfare regime, citizens have the basic right to enjoy “ecological welfare” or “long-term sustainable welfare”, to protect the subsistence of future generations and to spend decent life within the constraint of the former. This is the precondition of successful environmental protection and natural resource management.

## **3. Low growth economy**

Ecological modernisation is effective because it depends on market mechanism that gives strong motivations to individuals, firms and organizations. It is also effective because it works in global scale to persuade global actors such as international firms, financiers, and nation states in global market without appealing to their “moral” instincts. But its dependence on the market brings the following two difficulties.

Firstly, though ecological modernisation contributes to environmental protection, the long-term interest and welfare of human race, ecological modernisation’s short term favourable economic and welfare effects tend to be limited within certain economic and social groups and it could therefore create dissatisfaction among population. Secondly, the working of market mechanism has natural tendency to increase economic divide. High growth rate can compensate this negative effect, improving the real wage of low-income groups along with the worsening of income disparity of a nation, as Adam Smith suggested. However, current west European countries, Japan and south Korea, as well as south east Asian countries and China in coming decades, face the stagnation of population growth. It is improbable that these countries achieve high growth rate of GDP, since the long-term coefficient between GDP growth and population growth is exceptionally large. Under low growth rate, without improving the conditions of low-income groups and sometimes impoverishing middle income groups,



economic growth in market mechanism, even achieved by ecological modernisation, appears only the regime of increasing economic divide.

Therefore, ecological modernisation under low growth regime of an economy could disrupt the complementarity between environmental protection and welfare. As welfare regimes intervened to compensate market failures, ecological modernisation should be integrated into the regime of ecological welfare.

#### 4. Future of financial capitalism

It is also to be noted that low GDP growth creates the vulnerability of global financial market. Remarkable fast growth of emerging economies and some of developing economies in part caused by the inflow of capital from developed countries where the opportunity of profitable domestic investment is scarce. The inflow of capital into developing nations increase their economic wealth, but it also could damage global environment and worsen global natural resource crisis. Central banks of developed countries, forced by political pressure from dissatisfied population, recent years almost abandoned free market approach to financial sector to achieve high growth rate and employed zero or negative interest rate policy. The same policy in turn increases the volatility of financial market. Global regime of ecological welfare, if it is established as SDGs of United Nations demanding, can ensure eco-welfare of global citizens. If so, governments of developed countries do not have to aim at unrealistic high growth rate and developing countries can improve living conditions of their citizens by sustainable economic growth.

The volatility of financial market may have deeper roots than the characteristics of temporary trade cycle. Under the low growth regime of market economy, finding investment opportunity becomes more and more difficult. As Adam Smith, David Ricardo and Karl Marx argued, the falling rate of profit brings unfavourable condition for investors and therefore retards economic growth needed for the improvement of people's life. As long as world population growth continues, financial

capitalism can find adequate place to invest somewhere on the planet. It can survive decades more. But to promote investment in the domestic economies of developed industrial nations and distribute financial resources to developing economies efficiently without disturbances, several reforms of world financial market may be required. Even ecological civilization strategy of socialist China should respond to the above-mentioned success and failure of ecological development strategy under low growth economy in western European nations, since the growth rate of Chinese economy will become smaller within decades.

#### 5. "Stationary state society"

There is a good ground to compare ecological modernisation with Chinese ecological strategies such as ecological civilization. Although ecological modernisation sometimes has been seen in China as a "life-extension program" for dying late capitalism in the era of global environmental crisis, the advocates of the idea are, though having strong concern to environment, mostly socialists and social democrats in their political convictions. No one of them believes that capitalism is the ultimate end of human history. The society after capitalistic one is sometimes called "stationary state society", in which resource, environment and the population and activities of human race is in equilibrium. Probably when the explosive population growth of recent hundred years of industrial society is over, say, in the next century, "stationary society" with different governing mechanism will come into being. Ecological modernization viewed in the perspective is a transitional strategy within the framework of existing world order of market economy and financial capitalism, destined to bring global society to the next phase of social development. It is only the beginning of the great transformation. Ecological modernisation's initial results must be examined carefully to improve and invent policies towards the next stage of social development. In this sense, ecological modernisation shares the common goal with ecological civilization.



## V. Origin of the idea

Only less than four decades have passed since the idea of ecological modernization had been formalized and took a place in policy debate. It is too early to investigate theoretical origin of the idea in the history of social and economic thoughts.

Neo-classical economics has never contributed to the foundation of the idea. Environmental economics, a tributary of the mainstream economics advanced after the second world war mainly in Anglo-American academia, incorporated “environment” into extended market and performed cost benefit analysis of environmental policies. Its contribution to policy marking is limited to the introduction of market mechanism into environmental policy arena, such as emission trade, and the calculation of economic cost of environmental deprivation expressed in market price. It lacks long-term perspective of socio-economic development, role of innovation and, above all, the notion of socio-economic development through environmental policy, which is the fundamental of ecological modernization.

Both neo-Marxist economics and post Keynesian economics, resurged in 1970s, have never paid serious attention to ecological modernization. Although they have longterm perspective and structural change is one of the most favourite subjects of their argumentations, their works only treated economic growth, wage, poverty, innovation, organisation, and social system. “Regulation school” in France, the most influential neo-Marxist economics, has never published theoretical account of ecological modernisation. Regulationists’ theoretical interest has been in GDP growth, employment, innovation, and social institutions. Alain Lipietz is one of their able colleagues and published many books on environment, but he is rather a green politician against global capitalism. Post Keynesian economists have focused always on macro-economic variables, especially on investment. Economic growth in terms of GDP growth has been the function they wanted to explain. Both parties have

been occupied by the quest for “a new growth paradigm” comparable to Fordism.

It is true that there are economic theorists who contributed much to the idea of environmentalism. Among others, *Social Costs of Private Enterprise*<sup>22)</sup> of Karl William Kapp, *The Entropy Law and the Economic Process*<sup>23)</sup> of Nicholas Georgescu-Roegen and *Small Is Beautiful*<sup>24)</sup> of Ernst Friedrich Schumacher helped to conceptualise the ideas of environmental protection. Alfred Marshall himself promoted economic understanding of pollution by suggesting the concept of externality in the 19th century. But as far as ecological modernisation is concerned, sociologists, not economic theorists, played an influential role. The concept of structural change of industrial society was advocated by sociologists in the 1970s. Daniel Bell proposed the idea of “post-industrial society”<sup>25)</sup> in the midst of cultural change and the emergence of new social movements. MITI’s early policy proposal of ecological modernisation was probably a response of government officials and their advisor (Hiromi Arisawa, a Japanese economist) to the foreseeable change suggested by western sociologists.

“Schumpeterian renaissance” in the 1970s became substantial contribution to the foundation of the idea in following two points. Firstly, his theory of “innovation”<sup>26)</sup> became stimulus to the understanding of technological progress and economic change. Secondly, Schumpeter’s long-term analysis of economic evolution<sup>27)</sup> implied the prospect of structural transformation of economy and society by means of technological change. Institutional political economy, a mixed corps of political scientists, sociologists and anti-mainstream economists, emerged in the late 1970s when economic crisis attacked advanced industrial nations. They were practical, policy oriented researchers adapting empirical methods, willing to propose adequate policies on behalf of ineffectual economic theorists. This interdisciplinary, heterodox research tradition, together with post-industrialism, environmentalism, and Schumpeterian inspirations, cultivated a fertile

ground on which some chemistry worked and the idea of socio-economic progress through ecology was born. The research tradition that puts together history, policy, and institution to explain politically and socially important empirical phenomena, that is, the tradition of continental European political economy, supplied potting soil to the idea of ecological modernization.

However, it is unfair to say that mainstream economics had no place in the development. François Quesnay, one of the founding fathers of economic science in the 18th century, formulated the first model of economic growth in his *tableau économique*<sup>28)</sup>. His theory described macro-economic dynamism from technological and social factors: productivity and input-output table between sectors, distribution of output among social classes and collective decision of landlord class to invest. It was the first “macro-economic model” of national economy and its theoretical insights inherited by the theory of David Ricardo, Karl Marx, Wassily Leontief, post Keynesians, etc.. Quesnay recommended rapid economic growth of his kingdom by means of liberal market policy and agrarian reforms. On the other hand, as a prominent medical doctor of French kingdom, he stated that “net product” only produced by the nature with the help of human hands. Economic growth therefore cannot go beyond the limitation posed by nature’s productivity. Economic growth and its boundedness were both incorporated in the first formulation of growth model in the history of economics.

Adam Smith criticized Quesnay’s theory on the ground that agriculture was not the only productive industry<sup>29)</sup>. His proposition that rich country could remain competitive was said to have guaranteed ever-lasting economic growth of market economy. But he himself did not believe that contemporary economic growth would continue forever and predicted that rich country like Britain would decline in the future. His definition of national wealth was not GDP per capita<sup>30)</sup>. The wealth of a nation was to be defined as a volume of consumable material goods per capita. Hence it is theoretically possible in the

world of the *Wealth of Nations* that people’s living standard can be improved albeit stagnation or even decrease of GDP. In a wealthy country, he said, both material goods to be consumed and capital to be invested were abundant, then both prices of goods and profit rates were low.

David Ricardo, the champion of classical school of economics in the period of industrial revolution, foresaw in his masterpiece<sup>31)</sup> the end of economic growth on the ground of the limited productivity of land. Investment into agriculture will bring diminishing return of product. According to his theory of differential rent, this will cause falling average rate of profit, consequently discourage investment. Economic stagnation will result after the period of rapid economic expansion of industrial economy that he himself was an eyewitness. J. S. Mill, as a disciple of Ricardo, using this argument in his masterpiece in economics<sup>32)</sup>, expected the time of “bliss” would come when economic progress ended. With enough material wealth in their hands, people would be able to ignore economic growth and turn their attention to moral progress of humanity. This argument made Mill a prophet of “the end of industrial society” and the forerunner of the concept of “stationary state society”.

For Karl Marx, liberalist Mill’s socialist counterpart, “limits of growth” was not exogenic, as Quesnay, Ricardo and Mill had supposed, but endogenic. Technological progress of industrial economy will enhance organic composition of capital (*die organische Zusammensetzung des Kapitals*). This will result in the decrease of average rate of profit. The progress of industrial technology and social structure, not the scarcity of resource and environment, are the cause of the crisis of capitalist economy<sup>33)</sup>. Structural change of society is needed to ensure further progress of mankind. Although Marx praised the liberation of productive power observed in contemporary capitalist economy, his idea of “structural change” of economy and society gave basis to the idea of ecological structural change.

All these major figures in classical economics

argued for, not against, economic growth in their time. Nonetheless, none of them believed in the ever-lasting growth of industrial economy. They realized “limits of growth” and theoretically formulated it in their own ways. Exogenic and endogenic factors, such as the productivity of nature, scarcity of resource and environment, disfunctions of institutions and social structure, and ultimate goal of stationary state society, are the basic concepts behind the idea of ecological modernization.

## Notes

- 1) Risa Kato, “Development and Diversity of the Ecological Modernization Theory,” *Economic Science*, Vol.65, No.3-4 (2018), pp.31-44.
- 2) Dan Han, “China’s Ecological Civilization: A Study from Viewpoints of Ecological Modernization,” *Economic Science*, Vol.66, No.2-3 (2018), pp.21-33.
- 3) Risa Kato, “The Low Carbon Green Growth Strategy in South Korea: Study from Ecological Modernization Perspective,” *Economic Science*, Vol.62, No.1 (2014), pp.85-99.
- 4) “The European Green Deal is our plan to make the EU’s economy sustainable. We can do this by turning climate and environmental challenges into opportunities, and making the transition just and inclusive for all.” [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en).
- 5) Martin Jänicke, “Die wahre Wende, eine alternative Regierungserklärung,” *Natur, Horst Sterns Umweltmagazin*, Heft 4 und 5, 1983.
- 6) Martin Jänicke, Preventive environmental policy, as ecological modernisation and structural policy, IIUG dp 85-2, WZB, 1985.
- 7) Ibid.
- 8) SPD, *Das Neue Grundsatzprogramm der Sozialdemokratischen Partei Deutschlands*, 1989.
- 9) COM (2010) 2020 final, Communication from the commission Europe 2020, A strategy for smart, sustainable and inclusive growth, European commission.
- 10) Ibid.
- 11) S. Nagao, M. Jänicke, M. Schreurs and K. Jacob (eds.), *The Green Industrial Revolution*, Showa-Do, 2012.
- 12) Nobutaka Nagaoka, *Social Governance of “Green Growth”: Challenges of regions and firms in Scandinavian countries and Japan*, Minerva Press, 2014 (Japanese).
- 13) Robert Wade, *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*, Princeton University Press, 1990.
- 14) Peter A. Hall and D. Soscis, *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford University Press, 2001.
- 15) Miranda A. Schreurs, *Environmental Politics in Japan, Germany, and the United States*. Cambridge University Press, 2002.
- 16) From an interview with Martin Jänicke.
- 17) Martin Jänicke and Shinichi Nagao, From Ecological Modernisation to the Ecological Welfare State, 2019, unpublished paper. Martin Jänicke, “Ecological Modernization needs the Ecological Welfare State to overcome its limits,” presented at International Conference Ecological Friendly Welfare States and Civil Society in Asian Countries, Asia Japan Research Institute, Ritsumeikan University, Japan, 13-14 March 2021.
- 18) Shinichi Nagao (ed.), *Politics and Society in Scottish Thought* (Library of Scottish Philosophy Book 7), Imprint Academic, 2012.
- 19) Risa Kato, “Toward the Integration of Environment, Economy and Welfare: Rethinking Ecological Modernization and Energy Poverty,” *Economic Science*, Vol.67, No.3 (2014), pp.29-39. Yun Sun-Jin, “Korea Green New Deal and Inclusive Korea: the Current Status and Challenge,” presented at International Conference Ecological Friendly Welfare States and Civil Society in Asian Countries, Asia Japan Research Institute, Ritsumeikan University, Japan, 13-14 March 2021.
- 20) Huan Qingzhi, “Ecological Poverty Alleviation in Contemporary China from the Perspective of Ecological Civilization Construction,” Liu Jinlong, “The Current Situation and New Progress of Social Welfare System in Rural China,” presented at International Conference Ecological Friendly Welfare States and Civil Society in Asian Countries, Asia Japan Research Institute, Ritsumeikan University,

- Japan, 13-14 March 2021.
- 21) M. Jänicke, H. Münch, M. Binder, *Umwentlastung durch industriellen Strukturwandel? Eine explorative Studie über 32 Industrieländer (1970 bis 1990)*, Edition Sigma, Berlin, 1992.
- 22) Karl William Kapp, *Social Costs of Private Enterprise*, Cambridge, Mass.: Harvard Univ. Press, 1950.
- 23) Nicholas Georgescu-Roegen, *The Entropy Law and the Economic Process*, Cambridge, Mass.: Harvard University Press, 1971.
- 24) Ernst Friedrich Schumacher, *Small Is Beautiful: Economics As If People Mattered*, Blond & Briggs, 1973.
- 25) Daniel Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting*, Basic Books, 1973.
- 26) Joseph Alois Schumpeter, *Theorie der wirtschaftlichen Entwicklung*, 1912.
- 27) Joseph Alois Schumpeter, *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process*, 1939.
- 28) François Quesnay, *tableau économique*, 1766.
- 29) Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, 1776.
- 30) GDP per capita in terms of purchasing power parity is still not the same, but more similar equivalent to his definition than GDP per capita.
- 31) David Ricardo, *Principles of Political Economy and Taxation*, 1817.
- 32) John Stuart Mill, *Principles of Political Economy*, 1848.
- 33) Karl Marx, *Das Kapital Buch III*, 1894.