

Korea 2020: A Search for Balanced Future

Kyuhan Bae¹, Young-Myung Choi²
Ku-Hyun Jung³, Dalgon Lee⁴
Kwang Seok Lee⁵

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I. Introduction

The 21st century is already here (Drucker, 1989). Many people predict the 21st century will be fundamentally different from the 20th century (Drucker, 1989; Naisbitt & Aburdene, 1990). Looking back upon the past, Korea entered the 20th century lacking preparations in the midst of the nation's internal and external conflicts and confusion. As a consequence, Korea went through several periods of stagnation and difficulty during the first half of the century. However, Korea began to demonstrate its remarkable potential for modernization and development since the early 1960's. Within a quarter of a century, Korea has emerged as a developing nation rapidly approaching advanced status. Now, Korea is facing another turning point dividing the centuries. Her future depends on her determination and preparation today. The 1990's is the time for her to make choices and decisions that will promote the prosperity of the nation and the unification of two Koreas. It's the time to establish a more mature society. It's the time we should consider the public's demand for quality of life. It's the time to consider her natural environment deteriorating due to urbanization and industrialization. All this will be realized only through her devotion to the establishment of a society based on a vision of optimism.

There was a growing interest within the Korean government to make adequate preparations in the form of a study on the nation's anticipated response to the changing environment leading up to the next century. To proact for the rapid and fundamental changes expected in the 21st century, the Presidential Commission on the 21st Century was established on June 2, 1989 by a special directive of the President. The Commission comprise thirty-six noted scholars in four main fields of concern: national unification and international affairs, economic growth and balanced development, development of science and technology, and human life and values. The Commission will conduct its research over a period of five years, from June 1, 1989 to May 31, 1994. The objectives of the Commission are 1) to portend the future for the entirety of society from an integrated long-range perspective, 2) to establish desirable political policy through scholastic research and investigation, 3) to reflect the public's ideas about long-term objectives on national development and strategic policy for each field of concern. The Commission has set the year 2020 as the target of its study.

The Commission formed a special research team, named National Development Modeling Team, comprising four Commission members from each field of concern, one economist, and two modeling experts. The primary purpose of the team is to analyze and integrate issues in the four fields of concern and suggest governmental policy directions. The authors of this paper

¹ Professor, Kukmin University.

² Head, Nuclear Policy Analysis Dept., Korea Atomic Energy Research Institute.

³ Professor, Yonsei University.

⁴ Professor, Seoul National University.

⁵ Senior Researcher, Korea Atomic Energy Research Institute.

represent the team. We view Korea as a system and are going to identify key components of the system and their relationships and study the effects of each component to the whole system. In this paper, we introduce our work: the problem to tackle, approach, the model we pursue, and scenarios we work with. This is an on-going project. The final report of our work will be published at the end of 1992.

II. The Problem

For over 25 years since the early 1960's, Korea has achieved a remarkable economic growth, overcoming challenges at home and abroad. However, she has been facing other critical problems such as environmental pollution, unequal distribution of wealth, political instability, insufficient public health care, deficient housing, heavy city traffic, etc. Economic growth alone doesn't guarantee good quality of life. All members of the Commission were asked to pick five most critical problems Korean people should solve now for the 21st century. The members picked the following categories of problems: 1) democratization, 2) unification, 3) environmental protection, 4) development of science and technology, 5) economic growth, 6) social welfare, and 7) moral system. We decided to focus on the three categories of problems: economic growth, environmental protection, and social welfare because they are more quantifiable and seem to be more appropriate for our study.

Korea should maintain a high economic growth rate. The expansion of the economic base for national development is one of the most important prerequisites for building an advanced society. By sustaining the trend of modernization and development throughout the remainder of this century, Korea can enter the threshold of becoming a developed country. Simply to catch up with the income level of the advanced economies, the Korean economy must continue to grow at a higher rate than the rate of those advanced countries for several years in the future. One of the primary economic policy objectives of Korea will be to pursue a sustained high rate of economic growth. However, it's almost obvious that the Korean economy will not be able to maintain its high growth rates of the 1960's and 1970's. Currently, protectionism abroad is widespread and continues to rise. Developing countries, such as China and south-east Asian countries, are now emerging as strong competitors in the international markets. Korea is losing her competitive power because of high wage. Korea has to switch her economic strategy from labor-intensive industries to high-tech industries.

Korea should control pollution and protect the environment. Natural environment seemed to have been regarded as free in Korea. While maintaining high economic growth, she has almost neglected environmental pollution. The government and industries regarded environment pollution as an unavoidable consequence of economic growth. We regard population growth, urbanization, industrialization, and increases in energy consumption as four major factors that deteriorate natural environment and produce pollution. Presently, the degree of pollution in the urban cities and the major rivers considerably exceeds the tolerable degree recommended by international institutions. Environmental pollution directly relates to the health of people. It's not a problem of choice, but a problem of life or death. Many non-governmental organizations (NGO) have been established to promote the issue of environmental protection and they are getting more support from the Korean people. Furthermore, there is international effort to regulate the emission of some gases such as CFCs and CO₂. Korea has to strengthen the pollution control regulation and comply with the international regulations, which will affect most of Korean industries.

Korean people ask a fair share of the economic growth more than ever. A welfare society can be defined as a society in which anyone who wants to work can find employment and can actively participate in creative social activities. It is also a society where talented and diverse human resources are distributed evenly throughout the nation so as to permit balanced socio-economic development. The primary policy objective in the pursuit of economic growth in Korea has so far been to increase the size of national wealth and income to strengthen the

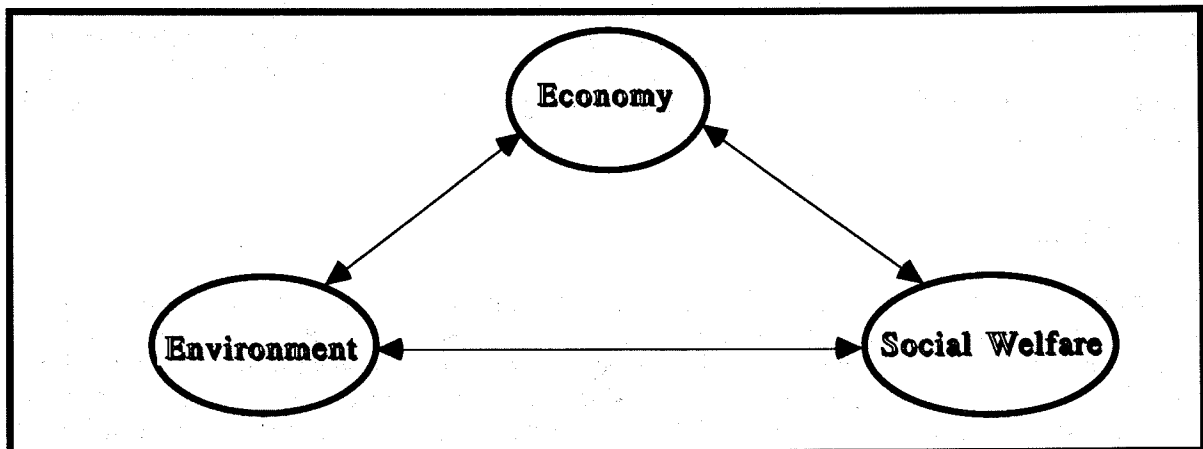


Figure 1. Balance is the key for the future of Korea.

nation's economic base. The need to do so has been well understood by the Korean people, who have been willing to persevere through both good and bad. The problem of equity in the distribution of income has not been posed a serious issue. However, as the people's basic needs such as clothing and food have now been largely satisfied, the problems of income distribution and relative poverty are becoming major social concerns.

The key is to maintain balance. Our primary concern is the balance of economic growth, environmental quality, and social welfare. We believe all three are interrelated. High industrial production rate will produce more industrial pollution and make environmental quality worse. Bad environmental quality will affect public health and industrial facilities, which will degrade industrial production rate. To conserve natural environment, we should invest capital on pollution control that could be invested in industries. Figure 1 represents mutual dependence between the three areas. The three areas should be considered altogether. The key is the balance between them, which was one of the most important virtues in the traditional Korean society. We believe Korea should switch her perspective from economic growth to balanced development of all areas. Therefore, our major problem is how to accomplish balanced development of the three areas. In other words, what should Korea do today to accomplish balance between economic growth, environmental protection, and social welfare in the 21st century?

III. Approach

We approach the problem with a systems view. Balanced development of Korea requires some form of systems approach. Even for a governmental policy, we should identify the factors that will determine the outcome, establish their relationships, and anticipate secondary effects. Recently, Korean government experienced, in a housing project, what can happen when lacking a systems view. Systemic thought is needed for us to solve the problem. While it is possible for experts to understand portions of national systems fairly well, but to put together more than a few of these relationships in an internally consistent manner without a formal technique is impossible.

We use system dynamics to model Korea. Several countries have done studies projecting and preparing the 21st century with their own or global perspectives, such as U.S.A. (Barney, 1982), The Netherlands (Huetting, 1980), Taiwan (Steering Committee of Taiwan 2000 Study, 1989), Britain (Northcott, 1991), the UN (United Nations, 1990). They approached their problem using econometrics, experts' projections, and/or system dynamics. We

concluded that system dynamics is more appropriate than econometrics for our work. We aren't concerned with detailed figures. Rather we want to see the whole picture of Korea and the dynamic behavior patterns of the components and indicators. Also we want to include experts' judgement in the model. We don't want to be confined by the need of statistical validation. System dynamics was used by *The Club of Rome* in a world model providing insight into some of the world's problems (Meadows et Al, 1974) and used in Taiwan 2000 Study (Steering Committee of Taiwan 2000 Study, 1989).

IV. Model

We're developing a model of Korea describing each area of the problem and their interrelationships. The model can be a tool to communicate effectively with experts in the areas. The model will be organized as the following sectors:

- Economy,
- Population,
- Environment,
- Social Welfare,
- Infrastructure,
- Energy and Resources, and
- Socio-Economic Indicators.

The economy sector will include production, consumption, price, export, import, investment, demand, etc. Industries will be classified into seven categories: agriculture and mining, light material industry, light fabrication industry, heavy material industry, heavy fabrication industry, infrastructure-related industry, and service industry. The population sector will reflect the fact that the portion of senior people is increasing. The environment section will include air pollution, water pollution, soil pollution, and solid waste. In the model, we will consider many feedback loops within and between the sectors such as investment-production loop, production-environment loop, etc. (See Figure 2). We don't have a draft of the model yet. However, the sectors may give some idea how the model will look like.

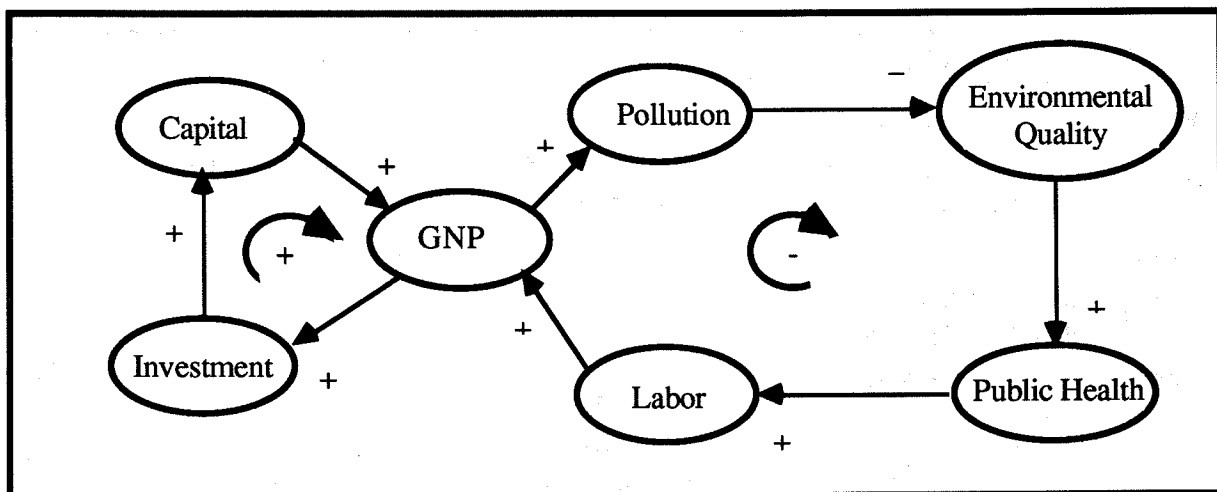


Figure 2. Investment-Production loop and Production-Environment loop

IV. Scenarios

We're going to develop three scenarios for the future of Korea. A scenario is the description of a potential future and of the path leading to it (Godet, 1987). From the scenario analysis, we believe we can learn and gain experience from the future in much the same manner as one does from the past. The first scenario will be a *status quo scenario*. In this scenario, Korea will continue to emphasize economic growth and neglect environmental and social welfare issues. The second scenario will be an *environmental scenario*. In this scenario, Korea will emphasize pollution control and environmental protection. Korea will strengthen pollution control regulations and industries will invest more in pollution control facilities. The third scenario will be a *social welfare scenario*. In this scenario, Korea will emphasize social welfare such as income distribution, low-income housing, etc. We're going to set policy variables and assign values to the variables according to each scenario.

VI. Discussions

This paper is a report of what we're thinking, not what we've done. We want to prepare what we can do today, not what we can do in the future. The key in preparing is the balance between economic growth, environmental protection, and social welfare. We're developing a model of Korea using system dynamics and scenarios describing a potential future of Korea. Scenarios combined with the model will provide us with valuable lessons on what we can do today.

We expect many difficulties in developing a model and scenarios. Especially, we think we don't have enough data to extrapolate coefficients and relationships between variables. To comply with this, we're planning to include judgement of experts in each area. We think those judgement can be included in the model easily with system dynamics. We will elaborate the model and the scenarios further and simulate the model with real data gathered. The project will be finished by the end of 1992.

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