
Science and Technology

Development

Ministry of Science and Technology

Role of Science and Technology

Science and technology has been an important instrument in effecting national development policy since the early sixties, and as a consequence, science and technology plans have been implemented in line with our economic plans.

The main features of science and technology strategy to support industrialization can be separated into three stages.

In the first stage, in the 1960's, the main development goal of industry was to lay a foundation for industrialization through the development of import-substitute industries, expansion of light industries, and support for producer goods industries.

The science and technology strategy was to strengthen scientific and technical education, to build up technological infrastructures, and to promote foreign technology imports. During

this period, the Ministry of Science and Technology, a central Government body, was established to undertake scientific and technological development. The Korea Institute of Science and Technology (KIST), a comprehensive industrial technology research institute, was inaugurated in 1966. The following year, in 1967, the Science and Technology Promotion Law was enacted [In 1981, KIST was merged with the Korea Advanced Institute of Science and Technology(KAIST)]

In the second stage, in the 1970's, the science and technology strategy aimed at strengthening technical and engineering education in the heavy and chemical industry fields, improving the institutional mechanism for adapting imported technology, and promoting research to meet industrial needs. These strategies were to support the Government's efforts to expand the heavy and chemical industries.

In line with these strategies, Government--supported specialized research institutes were established in the field of machinery, ship building, marine science, electronics, electricity, etc. The Technology Development Promotion Law and the Engineering Services Promotion Law were also enacted.

In the course of industrialization, the manufacturing sector has expanded substantially and contributed extensively to Korea's economic growth. Since the mid-1970's, the industrial structure has been remarkably deepened.

This leaves an important task facing the country in the 1980's to maintain the current growth rate and in particular to further enhance the efficiency of the manufacturing sector. In this context, in the third stage, in the 1980's, our industrial policy has been directed to transforming the industrial structure to one of comparative advantage, to expanding technology-intensive industry such as machinery and electronics, and to encouraging technical manpower development and enhancement of productivity. To this end, in the science and technology fields, we continuously sought the development and acquisition of high level scientists and engineers by adopting an extensive policy which includes reinforcement of graduate school education, expansion of overseas training programs, and the repatriation of exerts abroad. To promote the productivity of R&D, joint efforts among R&D institutes, universities and industry have been strengthened in the implementation of select large-scale R&D projects, and at the same time, joint research programs and joint ventures with other countries have been stressed.

By strengthening indigenous R&D capabilities and introducing advanced technology from abroad, we have localized the key industrial

technologies.

Outline of Science and Technology Policy

The Korean Government, recognizing the importance of science and technology to the country's development, has formulated and implemented science and technology development policies in an organized manner. Since the launching of the First Five-Year Economic Development Plan in 1962, science and technology development has been deliberately and systematically introduced into intergrated development planning to provide us with the means for reaching our overall development targets.

Particularly, the Government places heavy emphasis on the promotion of Science and Technology, with the intention of realizing the people's visions and hopes by taking concrete steps to push ahead with Science and Technology policy programs for the benefit of the general public.

The primary policy directions emphasize "creation" rather than "imitation", developing selected high-tech areas towards the 21st century, strengthening science programs for the younger generation and securing stable financial resources R&D investment.

For an effective science policy mechanism and institutional infrastructure, Korea's policy on Science and Technology development concentrates the following points :

First, the Government will continuously pursue technology-led policy, which allows Science and Technology to play a leading role in promoting socio-economic development.

For this, available resources are to be allocated for the promotion of science in a preferential

manner, inducing high caliber manpower to the science and technology field by enhancing the social environment for science and technology.

As for existing policies and systems which are liable to be easily diversified, they will be restructured in order to secure consistency and comprehensiveness from the viewpoint of technological innovation.

In addition, a Science and Technology Advisory Committee, consisting of representatives and experts from industrial, academic and scientific fields, will be established in accordance with Article 127 of the Constitution to recommend to the President the most desirable science and technology policies.

Second, the Government has placed special emphasis on the securing and nurturing of cadres of creative scientists and high caliber technological manpower in order to meet the rapidly increasing demand for R&D, both in the public and private sectors.

As of 1987, the total number of qualified scientists and engineers stood at 54,000, representing 13 persons per 10,000 population, showing that Korea is still short of high-caliber

manpower. To alleviate this shortage, the Government, together with the private sector, will pursue the realization of effective training in science and technology-related field in higher education.

In accordance with the long-term forecasting of high-level scientific and technological manpower requirements, we will secure a total of 150,000 scientists and engineers, or 30 persons per 10,000 population, by the year 2001.

Among them, 15,000 or 10%, will be tapped as the top level scientists capable of carrying out the leading role in their respective R.D. &E. fields. To this end, the Korean Government will reinforce higher science and engineering education, expand overseas training programs for advanced study, and also enlarge repatriation of Korean scientists and engineers abroad.

Third, the Government has drastically increased R&D investment, recording remarkable achievements since 1980. The budget for science and technology has been increased by about 15% annually over the past six years, while public enterprises, including telecommunications

Outline of Strategy		
Period	Industrialization	Science and Technology
1960's	<ul style="list-style-type: none"> ① Develop import substitute industries ② Expand export-oriented light industries ③ Support producer goods industries 	<ul style="list-style-type: none"> ① Strengthen S & T education ② Deepen scientific and technological infrastructure ③ Promote foreign technology import
1970's	<ul style="list-style-type: none"> ① Expand heavy and chemical industries ② Shift emphasis from capital import to technology import ③ Strengthen export oriented industry competitiveness 	<ul style="list-style-type: none"> ① Expand technical training ② Improve institutional mechanism for adapting imported technology ③ Promote research applicable to industrial needs
1980's	<ul style="list-style-type: none"> ① Transform industrial structure to one of comparative advantage ② Expand technology-intensive industry ③ Encourage manpower development and improve productivity of industries 	<ul style="list-style-type: none"> ① Develop and acquire top-level scientists and engineers ② Perform national R & D projects efficiently ③ Promote industries' technology development

and electrical power companies, are encouraged to set aside a sizable portion of their income for technology development.

Along with this, the private sector has also rapidly augmented their R&D investment by about 60% annually, helped in large part by various government incentive programs. As a result, the total amount of R&D expenditures jumped from \$577 million in 1981, or 0.9% of GNP, to \$1.8 billion in 1986, or 1.99% of GNP.

However, we will require more extensive funding of we are to upgrade our science and technology to the level of other advanced countries by the turn of the century. Therefore, we have set the goal of boosting R&D investment to 3% of GNP in 1991 and to over 5% in the year 2001. The Korean Government is determined to achieve this target.

Fourth, the Korean Government also has undertaken national R&D projects since 1982 which normally could not be pursued by industry alone, to develop key industrial technology for our industrialization. The criteria for selecting national projects include their technology intensiveness, international comparative advantage, conservation of energy and resources, growth potential and contribution to social development.

Among the projects of this nature, industry-oriented projects have been carried out via the joint efforts of industry, public institutes, and the Government, while those projects of public interest, such as energy and resources development and health and environment related areas, have been undertaken by the public sector itself.

In connection with the trend of the ever-increasing R&D scale and sophistication, the Government is responding in a systematic way by upscaling national R&D projects with in-

creased investment.

Fifth, in order to effectively utilize R&D resources, which are not sufficient in absolute scale, and to push ahead with policies systematically, the Korean Government redefined the role among Government supported R&D institutes, universities and private enterprise in carrying out R&D activities.

The R&D capability of universities and private enterprise was nominal in the 1960's, with most R&D activities being implemented by Government supported institutes. This has been changed drastically, particularly in the 1980's. Private businesses have set up their own in-house R&D facilities, greatly enhancing R&D capability while universities have also uplevelled their R&D capacity by allocating more expenditures for R&D.

In line this trend, universities pursue basic science, while private institutes undertake R&D for commercialization. Government supported institutes play the role of a bridge linking universities and private institutes, and are also responsible for the areas which private institutes cannot afford, due to heavy financial burden and high along with commonly based technology areas, having great impact on socio-economic sectors.

Sixth, in order to foster the industrial technology development, the Korean Government provides various incentives to private enterprise, which must play leading role in the process of industrial technology development in a free market economy.

In the case of proprietary technology, the Government makes available indirect incentives to the private sector under the principle of competition. Meanwhile, as for generic technology, the Government extends direct as well as indirect support for the private and public

sectors under the principle of cooperation.

Following these two basic principles, the Government recommends large scale companies to establish at least one research center per company, while small and medium companies are encourage to organize research & development consortiums in related fields. For this, various incentives are provided through tax exemptions, special depreciation, financial grants, availability of long-term low interest development loans, and Government procurement, among others.

As a result of such an incentive suestem, we have witnessed a remarkable increase in the number of private research institutes form 52 in 1980 to 503 in April, 1988, and of research consortiums from none to 37 in the same time period.

In addition, in order to be geared to the new policy direction of autonomy and market opening under the free market principle, the Korean Government will minimize control and restrictions on industry. For this, we will virtually liberalize technology inducement, revise the protectionistic measures for the local innovator and extensively overhaul the laws and regulations related to science technology to expand the scope of autonomy.

Seventh, Korea has strengthened international technical cooperation in order to meet the rising tide of internationalization of technology development.

Externally, to better cope with the growing interdependence of the world economy, Korea has been expanding both bilateral and multilateral international cooperation activities, especially since 1980.

As of the end of 1987, the Korean Government has exchanged scientific and technical cooperation agreements with 59 countries and

holds Science Minister Meetings regularly.

Furthermore, 69 international joint research projects have been in full swing with financial support from the Government amounting to \$4 million in 1988.

In the spirit of mutual benefit and complement, the Government will make continuous efforts for the exchange of researchers, technical information joint R&D programs and active participation in international cooperative programs. In addition we sincerely desire to expand technical assistance to developing countries to share our experiences and technologies for our common prosperity.

Eighth, domestically, the regional dispersion of technology development is regarded as one of our majar policy directions.

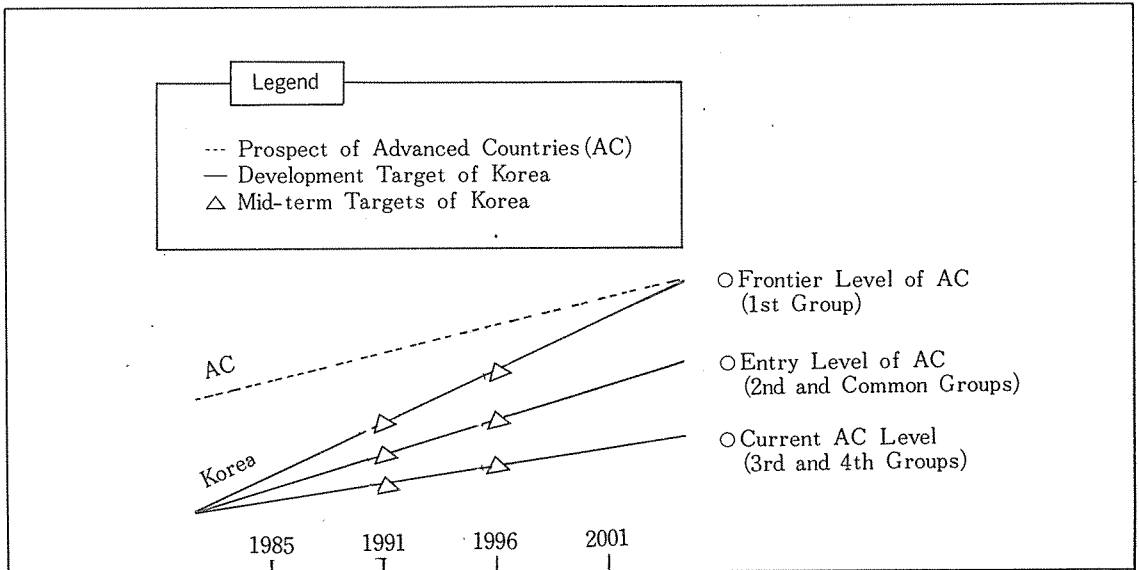
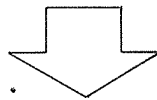
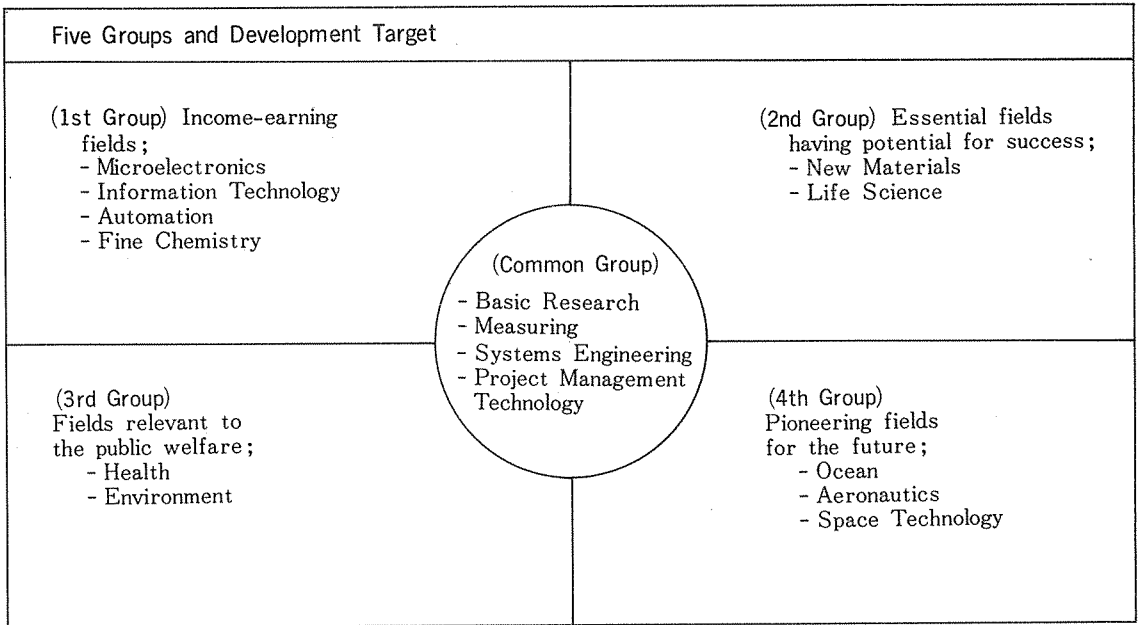
The Government has established industrial complexes in major regions of the country since the 1970's while actively promoting the construction of Daeduk Science Town along with new technology-based industries in the vicinity.

The Government also plans to construct other specialized research parks in the major industrial areas throughout Korea, forming a network with Daeduk Science Town as the core.

Ninth, a climate favorable to the development of science and technology has been a major policy goal for laying a solid foundation for science and technology.

As such, the Government, with the cooperation of the academic and industrial communities and the mass media, has launched a nation-wide science movement whose main objectives are to create an environment in which the general publec can apply scientific principles to daily living and to instill the exploratory attitude of youth in science with a spirit of rationality, efficiency and creativeness.

The Government also plans to launch a sc-



ience movement in a new dimension designed to enhance the ability of the people to adapt to a modern inustrialized society, thereby providing a strong foundation for national development.

Long-range Plan of Science and Technology Toward the 2000's

The Korean Government has set an ambitious goal of becoming a developed country by

the year 2000. For realization of this goal, the Ministry of Science and Technology has prepared a "Long-range Plan Science and Technology Toward the 2000's".

With our limited available resources, Korea realizes the difficulty in competing against advanced countries in every field simultaneously.

Therefore, we will select our comparative advantage areas, based on certain criteria, and push ahead intensively in these with all our capability.

Based on this premise, we have categorized science and technology areas into the following five groups :

The first group includes those areas which are economically feasible from a short-term viewpoint, such as informatics, fine chemicals and precision machinery.

The next group encompasses areas where the possibility of medium-term success is high including bio-technology and new materials.

Public welfare areas such as the environment, health and welfare constitute third group.

The fourth group is made up of oceanography and aeronautics, where the future prospects are promising in the medium-and long-term.

The common group, the last group, from the prospect of the short-,medium-and long-term,

is comprised of basic science and engineering, providing the basis for development in all sectors of science and technology.

For effective implementation of these five groups, we will pursue the following strategies.

The first one is the strategy for "Specialization", by which technology development will be specialized in specific fields with the limited available resources Korea has for R&D.

The next is the strategy for "Cooperation" in the development of technology—the systemizing of R&D capability by constructing a cooperative research system among industry, academia and research institutes.

Third, the strategy for "Internationalization" of R&D will be pursued in order to overcome the limitations of domestic R&D capabilities.

This is followed by the strategy for "Localization", the formation of a research and development network across major regions of the country. And finally, we should push ahead with strategy for "Autonomy", by which the private sector will enjoy a free hand in benefiting from the market mechanism.

By applying these strategies in harmony and balance, we will accelerate the nation's science and technology innovation in order to realize our target of joining the ranks of advanced countries by the turn of the century.

새로운 한·영정부 獎學제도

한국과 영국정부는, 1989년 3월로 종료된 (Technical Cooperation and Training Programme)를 대신하여 새로운 장학제도를 제공하는 데 합의했다.

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