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A NEW FRAMEWORK FOR SCIENTIFIC AND TECHNICAL
CO-OPERATION FOR DEVELOPING COUNTRIES^{1/}

Country paper

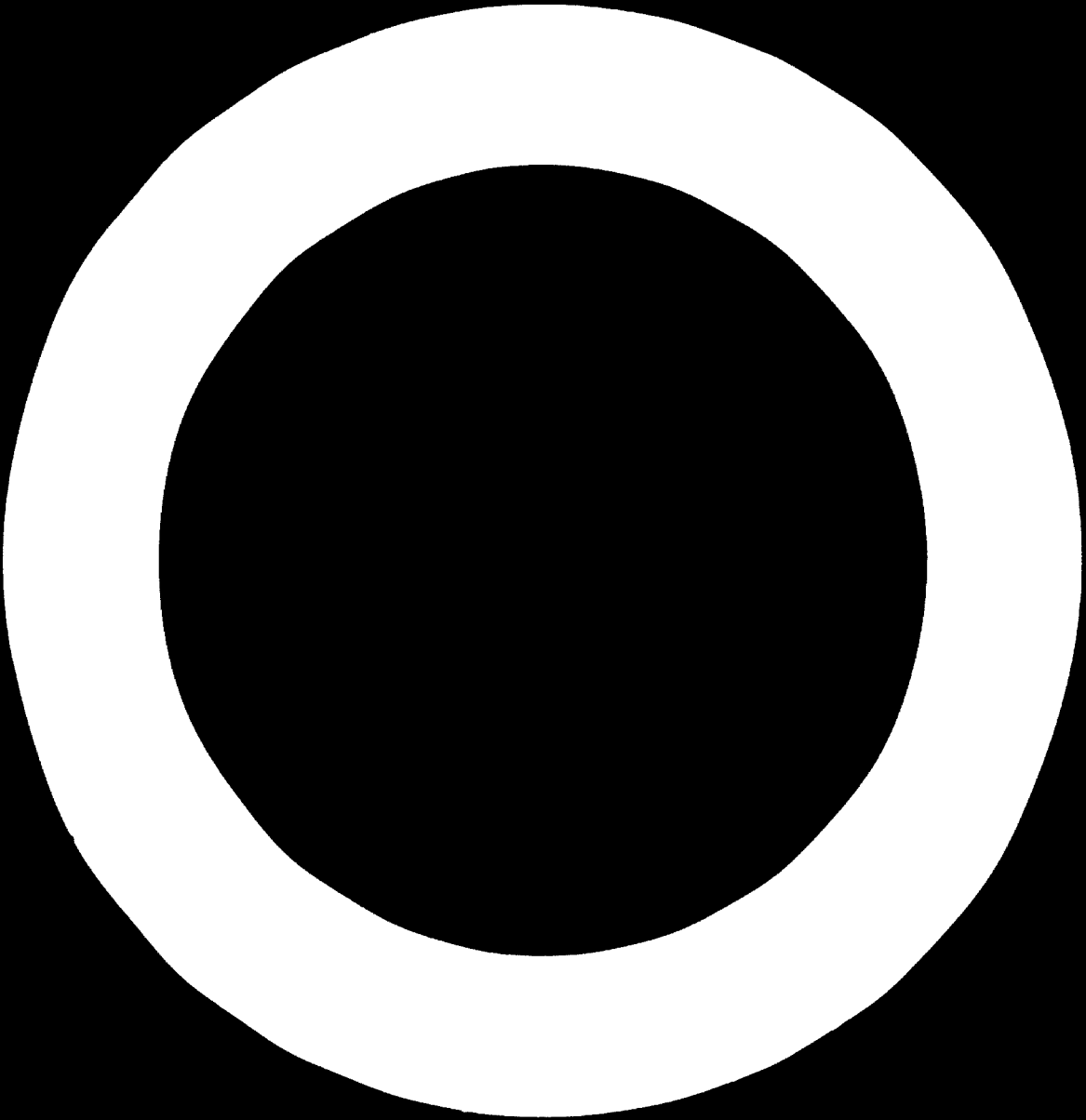
REPUBLIC OF KOREA

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I. Introduction

There is a widespread need in many less-developed countries for assistance in the development and implementation of science and technology policy, including the organization, development and evaluation of institutions created for this purpose, the development of management competence amongst the science and engineering community within the countries, and the identification and adaptation of appropriate technologies for their particular environments and situations.

Technical cooperation, multilateral or bilateral, has been undertaken directly between advanced countries and developing countries, but the science and technology of an advanced country is not always applicable in developing countries.

When an advanced country or a multilateral donor agency tries to cooperate with a developing country to meet its needs or a developing country seeks consultative services, it is suggested that a participation using other developing countries' experiences should be worked out.

For instance, when a donor country or agency gives consultative services to developing countries, it must try to build a service group so that advanced country technologies are combined with the experience of other developing countries. Korea is prepared and would be pleased to share its experiences in this area with other countries on a cost-compensated basis.

II. Need for Science and Technology Development Cooperation

It is apparent that there is a hierarchy of needs common to most developing countries with regard to the acquisition and adaptation of technology for their development and for the establishment of policies and institutions for these purposes.

The appropriate type of scientific and technical organization to be established in a given situation is frequently a difficult problem to solve. The proper design and organization of such institutions is a critical problem requiring a high degree of expertise to assure operating efficiency. Unfortunately, such institutions have often been created and have then become obsolescent, although they were originally appropriate to their time and place. It is more difficult to change an existing institution significantly than it is to start a new one. Unfortunately, this alternative of creating a new institution does not always exist and the nation's scientific policy-makers

are left with the choice of working with long-established organizations and procedures or doing nothing at all.

In either event - whether creating a new institution or refurbishing an existing one - the experience of other organizations and other countries in achieving such a change can provide useful insights and contribute significantly to the efficiency and effectiveness of the entity.

In seeking to optimize its technological evolutionary processes, a country's technology policy formulation and implementation authorities are frequently faced with the need to make a thorough and competent assessment of existing technological resources. In the science and technology planning process one of the most important elements is to assess the state of development, current problems and relative efficiencies of existing technical institutions and systems objectively. Most often this process can be very significantly assisted by enlisting consultation and assessment support from organizations and individuals from outside the country, who have highly specialized and current experience in making such assessments.

III. The Type of Experience needed to meet Industrial and Technological Development Requirements.

From the preceding brief discussion, it can be deduced that an experience which can be shared with a country in the process

of evolving its technological and industrial development policies, creating institutions to implement these policies, and evaluating existing institutional and organisational resources, should be from a country with the following principal characteristics.

- A. A cultural, social and economic background similar to that of the country seeking assistance.
- B. A stage of technological and industrial policy development with results in a current experience level which will yield useful comparisons for the recipient country.
- C. The existence of scientific and technological institutions at a stage of development and operation which will make possible valuable comparisons of experience.
- D. The existence of an industrial base which is sufficiently diversified and advanced to provide an index of comparison and a source of relevant experience.
- E. Access to all significant sources of available contemporary technology to:
 1. Aid in identification and selection of appropriate technology for the recipient country
 2. Assist in research and development for effective adaptation of such technology.

3. Have experience and competence in providing assistance in making realistic assessments of the economic, social and environmental effects of the adoption of such technology.
4. Provide a centralized point of rapid access to the most important sources of technologic and economic information throughout the world.

It becomes apparent that the availability in a single country or organization of all of these attributes is unlikely if not totally unknown.

What is needed might be termed a continuum of experience and knowledge beginning at a level approximately equivalent to that of the recipient country and extending forward through all intermediate stages of knowledge and experience, and culminating in an organization which has access to all principal areas of contemporary scientific and technological development, coupled with a sophisticated social and economic analytical capability.

IV. Proposed Plan

Through realization and discussion of the need for providing a continuum of experience in the areas of national science, technology and industrial policy development and implementation, it is important to frame an inter-organisational group in an interactive and well-organized network.

At any point in time there will be an array of institutions in various countries which can be observed in their various stages of development. To the extent that one country's cultural and economic situation is similar to another's, and that country's scientific and technological institutions are in a later stage of development, then presumably that country's experience should be of considerable value to the one seeking significant improvement in its own scientific and technological institutions.

With the rapid progress of industrialization resulting mainly from technological development, Korea is ready to share with other developing countries its experience in science and technology policy planning and execution by MOST, and its experience in establishing and operating KIET a multidisciplinary industrial research center.

Relatively brief descriptions of these two entities are presented in the Appendix.

A. Share of experience in science and technology policy formulation.

1. When donor countries or agencies dispatch survey teams to provide and support science and technology policy formulation, they must include experts from

advanced countries and experts from a developing country with experience in development in a developing country. Countries seeking aid should always request expert service teams with this balance of experience

2. When donor countries or agencies make arrangements for experts from developing countries to observe science and technology development, the experienced developing country must be included

B. Share of experience in establishing a multi-disciplinary industrial research center

1. Feasibility study for the establishment and operation of a multi-disciplinary industrial research center must be carried out by a balanced team including an expert or experts from advanced countries and from experienced developing countries.

V. Conclusion

In my opinion, it is a good idea for a donor country or agency to encourage the forming of a consultative group, in an interactive and well-organized network, including a research institution in an advanced country and a research institution which has passed part of the way along the road to development.

I would like to conclude this paper by mentioning that discussions between principals of the Ministry of Science and Technology of the Republic of Korea, Korea Institute of Science and Technology and Denver Research Institute of the University of Denver (U.S.A.) have yielded the framework for an inter-organizational consultative group which can meet developing countries' needs.

Appendix

Ministry of Science and Technology-Republic of Korea

The Ministry of Science and Technology (MST) established in 1966, has played a dominant role in the evolution of scientific and technological policy. MST is instrumental in creating and guiding Korean scientific and technological institutions whose purpose is to build and sustain the scientific base for the rapidly developing economy, and to assure the timely provision of the technological resources which are vital to the growth of the most rapidly growing and diversifying industrial base. In seeking to accomplish its mission, MST has developed an organization of experienced administrators and specialists in all areas related to scientific and technological development. Its major concerns include the followings:

- A. Creation and development of scientific and technological institutions,
- B. Initial and continuing training of scientific and engineering manpower,
- C. Formulation of science and technology policies and long-range plans consistent with national development goals.

- D. Effective representation and presentation to the legislative and administrative units of the government of the requirements for meeting scientific and technological goals and the securing of the necessary support for achieving these,
- E. Repatriation of highly qualified scientists and engineers from overseas to augment the increasingly sophisticated and diversified scientific and engineering capability of the country,
- F. Initiation and implementation of programs of scientific and technological exchange with other nations of the developed and less-developed world,
- G. Provision of support and incentives to industry to develop an indigenous technologic infrastructure.
- H. Securing of grant and loan assistance from aid-giving nations in support of its programs.

The Ministry is engaged in a diversity of programs and has developed the expertise and working knowledge required to carry out its tasks effectively. Korea is in an advanced stage of the development process, while experiencing or still being very close to the principal problems facing a developing economy, so the

Ministry and other Korean institutions possess have first hand experience which could be most useful to similar entities within other governments wrestling with the complex problems of national development.

The Korea Institute of Science and Technology (KIST)

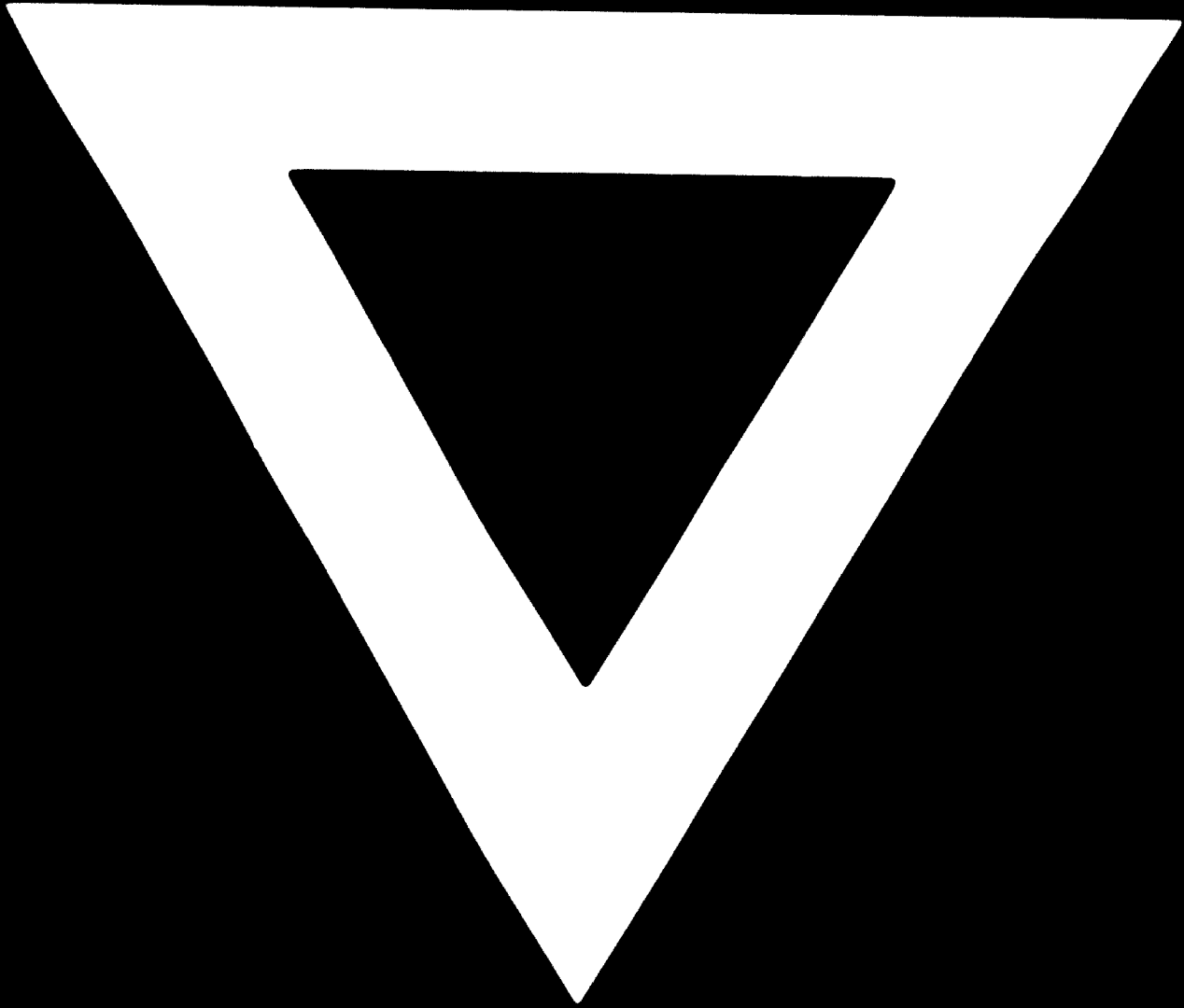
As part of Korea's technological infrastructure KIST is a unique and vital resource for the accomplishment of national industrialisation goals. Comprising a staff of over 800, KIST carries out scientific and technological research and development projects including numerous techno-economic feasibility studies of industrial projects in the order of US\$6 million per year for both domestic and foreign firms. Korea does not possess all the sophisticated technologies possessed by advanced countries, but its forte lies rather in the intermediary levels of technology which are eminently applicable in developing countries. A great deal of care as well as technological literacy has been found essential in setting out on the industrialisation path.

The institute, created in 1966, maintains extensive research and development facilities in mechanical engineering, electronics and electrical engineering, chemical engineering and chemistry, metallurgy and materials science, techno-economics and food science. Established on a self-sustaining and autonomous basis, it is sustained largely by research and development performed under

contract for the public and private sectors, industry, and government. In its brief existence, it has made many notable contributions to the industrial development of the country, through the development of new products and processes, the effective adaptation of existing technologies, techno-economic analysis, the provision of technical information and consulting services.

KIST maintains a far-ranging interaction with technological institutions throughout the world and has a program of sabbatical leaves for professional staff which helps maintain a contemporary capability in its technological undertakings.

In the process of its own evolution, KIST has gone through various stages of organizational development and adaptation in pursuing fulfillment of its original concepts and objectives. Thus the management of KIST has experience and insight into organizational problems and solutions of a specialized type which probably exceeds that of any other organization in the world. In addition to having extensive experience in meeting the technological needs of Korean industry, KIST has in-depth experience with the many internal and external problems which affect the success of a major technological institution, which if made available to similar undertakings elsewhere, could prove of immeasurable value in assisting with planning, organizational and implementation tasks.



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