

Chapter 1

R&D Innovation Strategy for International Cooperation of Science and Technology in Asia

Donghun Yoon

Korea Basic Science Institute, South Korea

ABSTRACT

Major Asian countries, along with the United States and the European countries, recognize the importance of international cooperation in R&D (research and development). In particular, the U.S. and the European countries recognize the importance of R&D cooperation with Asia, and strive for closer cooperation therewith, especially scientific and technological cooperation. Cooperation in international development and the establishment of networks in the Asian region are crucial to countries' advancement of scientific and technical capabilities. Presented and discussed in this chapter is the R&D innovation strategy for international cooperation in science and technology in Asia. Also presented and discussed are ways of simultaneously satisfying both economic values and the ideal value of the international community's prosperity. It is hoped that this study will contribute greatly to the pursuit of international cooperation in science and technology in Asia.

INTRODUCTION

The global economy is growing rapidly through the development of science and technology. Based on the results of the R&D (research and development) innovation, the global economic growth is making human lives better (Zartner, 2010). The growing popularity of this 'new' form of activity is taken as further proof of the unstoppable march of globalization, particularly as a large and growing number of these agreements involve firms of at least two nationalities (Narula & Hagedoom, 1999). R&D cooperation enables firms to internalise the knowledge spillovers and eliminate the disincentive effect of spillovers on R&D (Belderbos et al. 2004). The problems of poverty, environmental degradation, and human rights violations in low-income countries and the development-related problems in developing countries, however, should be addressed worldwide (Henökl, 2018; Jaramillo, 2012). About 20% of the

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world population lives on less than USD1 a day, and the gap between advanced countries and developing countries is widening. To address the problems of economic growth and poverty reduction in developing countries, advanced countries are providing official development assistance (ODA) (Tallberg, 2010). ODA is a supportive policy tool provided to developing countries to help solve human problems like poverty and environmental degradation, and is given to more than 180 countries worldwide (Sanderson, 2010). The targets and ranges of ODA vary widely and include scientific technologies (Urpelainen, 2012). Since recently, the world has been paying attention to the economic growth and technological developments in Asia, and is very excited about the future developments in Asia. Asian countries have grown to be the most influential countries in the world, with South Korea, Japan, China, Taiwan, Singapore, etc. among the most advanced countries in the world in terms of the R&D system. The R&D investment of 10 Asian countries, including South Korea, Japan, China, and India, is close to the \$400 billion U.S. R&D investment in 2012. Multinational corporations have been paying attention of late to the potential of Asia, setting up R&D centers therein and investing a large research-related amount in the field of human resources in the region. Many Asian countries also have many natural and human resources, making them an alternative to solving the problems related to energy, resources, and science and engineering worldwide. The energy resources in Central Asia, the natural resources in Southeast Asia, and the excellent human resources in China and India can modify the global competitive structure. Asian countries have set many priorities to ensure their continued economic growth and scientific and technological competitiveness, and to enhance innovation. Asia faces significant regional gaps and common problems like environmental issues, infectious diseases, and climate change, which need to be analyzed and evaluated to be addressed. Major advanced countries have been setting up policies of late to comprehensively analyze their qualitative and quantitative innovation capabilities. Major Asian countries, including South Korea, Japan, and China, are working to enhance their capabilities and gain leadership in the region. In this paper, ways of cooperating in selecting leading positions in the Asian region will be proposed.

R&D AND INTERNATIONAL COOPERATION

Like the innovation systems of other OECD economies, government policy, industrial R&D strategies, and international competition have produced significant structural change in the US and other OECD members' national innovation systems (Mowery, 1998). Successful innovation depends on the development and integration of new knowledge in the innovation process (Cassiman & Veugelers, 2002). Investment in R&D activities plays a key role in creating a positive image and produces the level of innovation required in the society. It is also an important tool for enhancing the national competitiveness for economic development (Devictor, 2013). In many countries, the interest in scientific R&D and the demand for its role in their economic development are growing, along with the perception that R&D is important for international competitiveness (Buckley, et al., 2015). Gassmann and Zedtwitz (1999) identify five types of structural and behavioral orientation in international R&D organization: the ethnocentric centralized R&D, the geocentric centralized R&D, the polycentric decentralized R&D, the R&D hub model and the integrated R&D network. Science and technology is presented for the scale of national international competitiveness (OECD 2012). It commands beyond the average level of aid at the recovery or reconstruction level, and the overall scale of the R&D ODA is constantly expanding. The amount of ODA provided for the R&D sector was about 1.0% of the total amount for ODA in the Development

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