The Rise of Korean Innovation Policy for Social Problem-Solving: A Policy Niche for Transition?

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Abstract

Technology supply has been the main thrust of the Korean government's science & technology policy, focusing on the development and acquisition of new technology in line with the catching-up strategy of economic growth and industrial development. However, new social or societal problems have become major government policy issues, heralding new innovation policy aimed to address them. Such new policy initiatives for social problem-solving present a niche where the existing system of government innovation policy process is challenged, including such processes as goal-setting, planning, implementation, project management, and evaluation. The rigidity of the existing institution of government innovation policy, however, still shapes the content and progression of innovation policy for social problem-solving. This study reviews Korean innovation policy for social problem-solving as a policy niche, and aims to clarify its challenges and opportunities. It uses a system transition framework to explain the emergence and evolution of the innovation policy niche in Korea. The main research question is to what extent and in what aspect the existing innovation policy regime shaped innovation policy for social problem-solving. The study examines the inertia of the current paradigm of innovation policies and R&D programs, and sheds light on the search for a distinctive identity for innovation policies that tackles social problems.

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1. INTRODUCTION

Technology supply has been the main thrust of the Korean government's science and technology policy, focusing on the development and acquisition of new technology in line with the catching-up strategy of economic growth and industrial development. It worked under the assumption that the output of government R&D projects would diffuse into society and contribute to resolving economic and social problems. Neither the acceptance of new technologies by society nor the consideration of their impact on the local user community has been a foremost concern of government innovation policy.

Recently, however, new social problems such as socioeconomic polarization, low birth rates, an aging population, and climate change have emerged as major government policy issues, prompting the appearance of new innovation policies aimed to address them. These new policy initiatives for social problem-solving present a niche where the existing system of government innovation policy process is challenged, including such processes as goal-setting, planning, implementation, project management, and evaluation. It explicitly declares social problem-solving as its goal and shifts focus from technology supply to social needs-driven technology use. It not only replaces technology-driven planning with social needs-driven integrative planning, but also requires "participatory governance" in the innovation policy-making process. This policy explicitly promotes the participation of a diverse array of social stakeholders beyond just scientists and specialists (Song & Seong, 2013; Song, Seong, Kim, Jang, Jeong, & Lee, 2014).

However, new R&D initiatives aimed at solving social problems require a new approach as they substantially differ from traditional industrial innovation strategies in terms of objectives, processes, and main actors. New R&D initiatives with key social objectives put their highest priorities on meeting and solving societal problems and needs; public participation would also be sought in planning, implementing, and evaluating relevant programs and projects, as citizens directly experience social problems in their everyday lives, and their practical experience and local knowledge could be useful in designing and operating these programs and projects. The rigidity of the existing institution of government innovation policy, however, still shapes the content and progression of innovation policy for social problem-solving. The legacy of technology supply policies focusing on economic growth and industrial development remains strong and influential.

This study reviews Korean innovation policy for social problem-solving as a policy niche, and aims to clarify its challenges and opportunities. It uses a system transition framework to explain the emergence and evolution of this innovation policy niche in Korea. The main research question would be to what extent and in what aspect the existing innovation policy regime has shaped innovation policy for social problem-solving. The question involves examining the current paradigm of innovation policies and R&D programs, and sheds light on searching for and establishing a distinctive identity for innovation policies to tackle social problems.

2. SOCIO-TECHNICAL SYSTEM TRANSITION AND POLICY NICHE

Transition theory describes the transition into a new system by pointing out issues within the current system, with transition into a "sustainable socio-technical system" as a long-term vision and goal. Various policies and programs are being developed to achieve this objective. Unlike innovation system theory, which is somewhat equivocal about the orientation of the system, transition theory talks more about practical solutions (Kemp & Rotmans, 2004; Loorbach & Rotmans, 2010; Van den Bosch, 2010).

Transition theory considers both macro and micro aspects through a multi-level perspective. According to this approach, socio-technical systems have many layers: social, economic, and physical landscapes, socio-technical regimes, and niches (Geels, 2002; 2004).

FIGURE 1. Socio-technical System Transition from a Multi-level Perspective
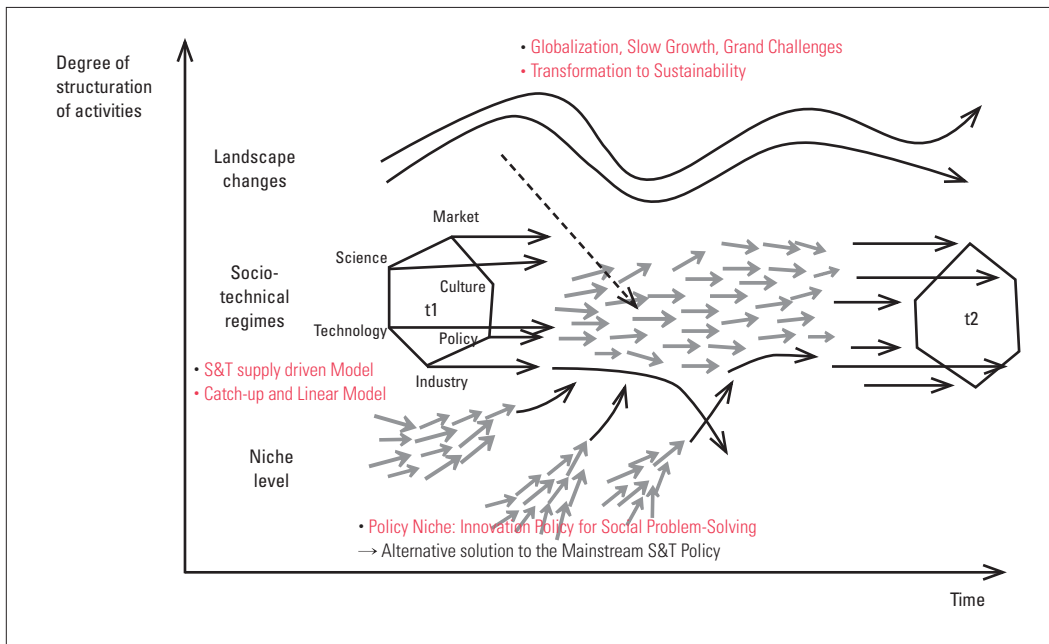
Source: a revision of Geels (2004)

In this situation, the social, economic, and physical landscapes (structures that are not easy to change) serve as the background of the socio-technical regime. For example, phenomena such as urbanization, aging, and globalization are landscapes that define the way long-term and sustainable technological innovations take place. The socio-technical regime, which is a currently dominant socio-technical system (e.g., combustion engine-based transportation system – automotive industry – transportation system – insurance system –private ownership system – energy supply system – in-

dustrial policy), controls most innovation-related activities. The niche level is where the seeds of a new socio-technical system differing from the existing dominant socio-technical regime are formed (e.g., space for small-scale experiments such as electric vehicles, joint ownership and use, and road and transportation systems), serving as the seeds of transition itself (Geels, 2002; 2004; Song & Seong, 2013).

Transition theory thus emphasizes the dynamics of system transition by adopting a multi-level perspective. In transition theory, system transition is an activity where agents of new socio-technical systems (innovation agents at the niche level) disassemble the existing socio-technical regime (t1) and build a new socio-economic regime (t2) by effectively utilizing new opportunities released from changes in the landscape (e.g., rapid progress of globalization or aggravated climate change) (Geels, 2004; Song, 2013).

Since total system transition cannot be achieved in a single step, small-scale policy experiments in specific regions or areas serve as touchstones. When small-scale experiments succeed, they can be more widely applied and knowledge will accumulate in the process to better respond to uncertainties. Unlike existing innovation-related projects (innovation experiments), transition experiments emphasize experiments and learning based on linkages and cooperation among many different agents when aiming at transition in socio-technical systems. As it involves the real-life testing of a new socio-technical system, the actual living environment is prioritized. The results of transition experiments often serve as the basis for incremental changes in the existing socio-technical system (Brown, Vergragt, Green, & Berchicci, 2004; Geels, 2004; Loorbach & Rotmans, 2010; Van den Bosch, 2010; Van den Bosch & Rotmans, 2008).

Ever since system transitions were brought out on important issues in sustainable development over the past few years, national R&D in South Korea has faced significant challenges. Particularly, innovation policies aimed at solving social problems are beginning to take on a more concrete form in Korea. For example, science and technology-based programs for tackling major societal challenges—including climate change, energy and the environment, healthcare and welfare, and safety—have been planned and implemented at the government level. These efforts are expected to provide an initial impetus for the direction of innovation policies to gradually change from "technology-acquisition/supplier-oriented" to "problem-solving/user-oriented."

"Participation" and "transition" are the two key elements in socio-technical system transition, where technology suppliers, civil society actors, and relevant stakeholders, as technology users in specific contexts of social problems, work together in the process of making a transition vision and carry out innovation activities to realize systemic transition. Seen from the system transition perspective, R&D programs and social innovation activities focused on solving a specific technical or social problem take on new meaning as transition projects that enable system transition. This new meaning is not given by technology suppliers, but is socially constructed through the deliberation of stakeholders including technology users.

This study is an attempt to evaluate, from the perspective of user participation and transition, both current R&D programs of the Korean government and innovation activities of social economy organizations attempting to find solutions to social problems, and based on these observations, to suggest ways to improve these novel efforts. This could provide a new perspective against the current paradigm of innovation policies and R&D programs, and contribute to the search for a distinctive identity for innovation policies that tackle social problems (Song, Seong, Kim, Jang, Jeong, & Park, 2015).

3. HOW SOCIAL PROBLEM-SOLVING INNOVATION POLICY EMERGED

3.1. The Rise of Welfare and Social Issues

The Republic of Korea underwent a period of compressed economic growth since the 1960s. Welfare of quality-of-life issues were given less priority in the process, but as the fruits of high growth were more widely distributed, living standards began to rise in tandem. However, with the 1997 Asian Financial Crisis, the implementation of neoliberal policies began to exacerbate economic and social polarization. Such polarization, combined with issues arising from low birth rates and the aging population, began to expand the social demand for welfare.

The 2012 presidential election provided an opportunity for welfare issues to take center stage in national policy discourse. The "social" aspect, which tended to have been overlooked in the policy sphere, began to be debated within innovation policy. While previously there had been discussions concerning the social effect of innovation along the lines of improving quality-of-life and the harmonization of economic growth and the environment, such efforts tended to be merely rhetorical. But with the presidential election, welfare issues and economic inequality developed into core priorities within science, technology, and innovation (STI) policy. STI policy, until then having focused solely on industrial development, could no longer stand apart from such social issues.

3.2. Pursuing Post-catch-up Innovation

So far, Korea has utilized a strategy that aimed to swiftly catch up to the progress of advanced nations. This strategy involved selecting technologies that had come to a certain point of development in countries at the forefront of innovation, and then concentrating resources into this technology, modifying and bringing it to market as quickly as possible. Any social or technological vision or consideration for the needs of society or the problems that may arise from the realization of the technology was easily picked up from precedents.

As such catch-up strategies succeeded, a few companies managed to break into the upper echelons of global competitiveness, but this was the beginning of a new conundrum. In the past, they would simply utilize the exploratory work of advanced countries, but now they have to seek out opportunities on their own, in a new post-catch-up situation that calls for themselves to come up with a vision

and predictions as to what the socioeconomic needs are, and how demand would play out. They were used to being given problems to solve, but now it is up to them to discover or come up with problems. This new innovation strategy requires a problem-oriented approach wherein innovation activity must be executed with socioeconomic vision and needs in mind.

Innovation that focuses on solving socioeconomic problems is a problem-oriented innovation activity that takes on the characteristics of a post-catch-up perspective. Instead of concentrating on the acquisition of technology itself, it shifts emphasis to defining the problem and bringing together various technological and non-technological elements to solve the problem at hand (Choung, 2015; Choung, Hwang, & Song, 2014; Seong & Song, 2010; Song, Seong, Kim, Hwang, & Cheong, 2006).

4. THE CHARACTERISTICS AND EXECUTION PROCESS OF SOCIAL PROBLEM-SOVLING INNOVATION POLICIES

4.1. The Characteristics of Social Problem-Solving Innovation Policies

Social problem-solving innovation policy, which began in the early 2010s, has certain differences in purpose, process, and major actors in comparison to previous science and technology innovation (Song & Seong, 2013; Song, Seong, Hong, Han, & Park, 2012)

Korea's social problem-solving innovation policy characteristics are revealed in its social problem-solving research and development projects. These R&D projects currently being undertaken are clearly different in purpose and execution compared to previous R&D programs. These are innovations in the paradigm of R&D systems that were centered on strengthening industrial competitiveness and technology acquisition. This approach expands the objectives and reach of the projects while putting problem-solving at the center, changing the very frame of the previous provision-based system. Unlike earlier governmental R&D projects that have their issues defined by the government and a specialist minority, various stakeholders participate in planning and pressing innovation activities. Here, the role of the government is not to define a problem and distribute resources towards strategic research, but to establish platforms where different actors can organize themselves.

TABLE 1. The Characteristics of Korea's Social Problem-Solving Research Development Projects

		AS-IS technology acquisition	TO-BE social problem-solving program
Objective		Growth-based, focusing on national economic development	Human-centric, pursuing better quality of life as well as economic development
		R&D, R&BD → R&SD (Research & Solution Development)	
Primary Objective		Acquire scientific and technological competitiveness	Solve social problems
Characteristics		· Technological fusion · Provider-centric R&D	· Problem-solving fusion* · Recipient-centric R&D
Characteristics by stage	Planning	Research division-centric	Research division and policy division cooperation-centric
	Management	R&D progression-centric management (program manager)	Problem-solving and change management (solution consultant)
	Evaluation	· Research results such as papers or patents · Verification of research results, dissemination	Extent of social problem resolution through the production and delivery of products and services or by systemic transition
Main impetus		Technological development	Exploration of social problems and systemization of service delivery

*technology + humanities and social science + regulation
Source: National Science and Technology Council (2012)

4.2. The Promotion of Social Problem-Solving Innovation Policy

Social problem-solving innovation policy began in earnest with the advent of: 1) the pan-ministerial "Strategy for a Happier Korea New Science and Technology Program (2012)" and its implementation policy "Comprehensive Implementation Plan for Science and Technology-based Solutions to Social Problems (2013)" and 2) the Ministry of Science, ICT and Future Planning's social problem-solving technology development project. These ventures have gone beyond simple growth to present a vision of tandem growth with better welfare and social benefits, confronting long-term and structural issues such as low birth rates, an aging population, income inequality, and falling growth potential while emphasizing the role of science and technology for the improvement of the quality of life for the nation's people (Song et al., 2014; Yang, 2014).

4.2.1. Multi-ministry R&D Project for Solving Social Problems

At the end of 2013, the Science and Technology Evaluation Concil deliberated upon the "Comprehensive Implementation Plan for Science and Technology-based Solutions to Social Problems." The Plan is a policy that sets the resolution of social problems as its main objective, and is the first implementation plan that aims to solve social problems through science and technology.

As part of this plan, a multi-ministry R&D project for solving social problems was formed. Thirty social problem issues were discerned through analyses of megatrends, and ten implementation projects were selected through citizen surveys and professional workshops. A pan-ministerial collaborative planning effort towards each implementation issue was undertaken, and so far eleven projects have been set to date including the disaster victims safety project entered in 2014. Each project is run for the next five years, aiming to present a solution by the end of that time (National Science and Technology Council, 2012; 2013).

TABLE 2. Major Social Issues and the Pan-ministerial R&D Project for Social Problem-Solving's Ten Selected Issues

	30 major social issues	10 selected issues
Health	Chronic diseases, rare diseases, addiction and depression, neurodegenerative disorders ⟶	Chronic diseases
Environment	Household waste, indoor air pollution, water pollution, environmental hormones ⟶	Household waste, water pollution, environmental hormones
Culture and recreation	Lack of cultural opportunity, lack of cultural and recreational spaces	
Public safety	Sex crimes, food safety, cybercrime, household accidents ⟶	Food safety, cybercrime
Natural disasters	Natural disasters, chemical accidents, epidemics, radioactive pollution ⟶	Natural disasters, epidemics, radioactive pollution
Energy	Electricity supply, energy poverty	
Housing and transportation	Faulty and old housing, traffic congestion, traffic safety ⟶	Traffic congestion
Family	Isolation and suicide in senior citizens, domestic violence	
Education	Inequality in education, school violence	
Social equality	Inequality in medical care, information divide, the disenfranchised, discomfort in daily life	

Source: National Science and Technology Council (2013)

The eleven project plans are being undertaken as the second stage of the collaborative effort conducted by participating ministries based on preliminary planning by the different ministries with the Ministry of Science at the helm. The preliminary planning involved analyzing the causes and structure of social problems and presenting solutions that satisfy the needs and social acceptability of the community at large. Additionally, it involves an implementation system that enables the different ministries to complement each other. Collaborative effort refers to detailed plans that are being pursued based on the preliminary planning research. This involves the collaboration of managing and participating ministries and the Ministry of Science towards more detailed planning for R&D and changes to the legal framework. Because social problem-solving R&D projects require different

objectives and processes compared to the previous R&D paradigm, projects are being undertaken in the form of preliminary planning, creating the larger framework and the associated ministries using this to simultaneously execute learning and more detailed planning (Song et al., 2014).

4.2.2. The Ministry of Science's Social Problem-Solving Technology Development Project

The Ministry of Science's social problem-solving technology development project aims to: 1) contribute to the improvement of quality of life by resolving social problems relevant to the lives of citizens through science and technology, and 2) create products and services that can change the daily lives of the people by linking technological development with laws, regulations, and service delivery (NRF, 2013).

The total project timeframe is within three years, and each year 3 billion won (9 billion won total) are provided to each project team. In 2013, the topics were youth obesity, increase in cancer treatment expenses, and toxic chemical spillage. In 2014, they were algae and fine dust, with two project teams created. In 2015, a technological development project targeting the economically disadvantaged was put in place, with the name of the project changing to "Civil Research Project for the Resolution of Social Problems" accordingly.

The project was executed under four directives. The first was to pursue demand-based R&D. By excavating social problems through feedback from the public and evaluation that targets policy users, a certain sensitivity was raised concerning the policy recipients' demands. The second was to pursue object-oriented R&D connected to law, regulations, and service delivery. Recipients and diverse development actors including R&D researchers, humanities and social science experts, and engineers had to be drawn into the development process and encouraged so the created results would contribute meaningfully towards problem-solving. The third directive was to accelerate the development of real products and services that could be utilized in daily life. Using the acquired base technologies, concrete products and services will be developed within the three-year project timeframe. Lastly, a support system must be provided to raise efficiency. A collaborative system will be established between relevant ministries towards the on-site application of technological development, and an advisory committee for each project will be provided for consultation relevant to each endeavor (NRF, 2013; 2014).

5. PROGESS AND LIMITATIONS OF SOCIAL PROBLEM-SOLVING INNOVATION POLICY

5.1. The Progress of Social Problem-Solving Innovation Policy

5.1.1. The Search for New Innovation Policy

Social problem-solving innovation policy combines neglected social issues with science and technology to create and experiment with a new kind of policy. Issues that had once stopped at mere discussion such as improving quality of life, solving social problems, and the sustainability agenda

have become new goals in science, technology, and innovation (STI) policy and R&D, concretizing into actual efforts through social problem-solving R&D projects. Through this, STI policy that had focused on industrial development and corporate support forged a new relationship with society and managed to take on social responsibility in a more specific manner. The deeper implications of this approach where innovation policy begins not with provision of technology but the usage and social demands of technology presents a new perspective for innovation policy.

5.1.2. Experiments in Implementation System Innovation and Participatory Governance

Social problem-solving innovation policy provides an opportunity for reform in the implementation system of R&D projects as well. Previous R&D projects had put more weight on technology acquisition rather than problem-solving. In other words, the core issue was determining which technology to develop next. But social problem-solving projects emphasize solutions, and a new process that analyzes social problems and listens to the relevant stakeholders was put into place. Additionally, consideration began for verifying technologies and systems developed for problem-solving, as well as for the delivery system that would bring the solutions to the policy user. Previous projects would run under the assumption that corporations would be using the policies, and there was not enough consideration for the end user. However, social problem-solving projects take into account various delivery actors such as corporations, public institutions, and social service organizations, making an effort to link them to R&D projects (Song, 2014). This point is exemplified through the experiments of "participatory governance" that involves the R&D collaboration of various actors that go beyond the previous configuration of government and researchers in the creation and implementation of policy.

5.1.3. Experiment in Collaboration between Ministries and Policy Integration

Social problem-solving innovation policy brought new changes to the way the government works. In order for a social and technological approach that integrates the legal and regulatory framework, infrastructure, and delivery system, cooperation between different government offices is essential. Because of this, social problem-solving projects are executed in multi-ministerial form, and even in cases where a skills-based ministry like the Ministry of Science take on a central role, a strong linkage with the recipient ministry can be seen. This linkage between ministries shows a new kind of organizational method intent on developing new technology and solving social problems. Technological development policy and technological use policy that used to move forward individually are now coming together under a new policy integration model (Seong, Song, Jeong, Kim, Park, & Jeong, 2012).

This project can provide experience in linking technological development and social policy projects from the perspective of social policy ministries that are involved in welfare, the environment, and public safety. This enables these ministries to take on a more innovation-aware approach in their subsequent policymaking (Song et al., 2014).

5.2. The Limits of Social Problem-Solving Innovation Policy

There is a current tendency for social problem-solving innovation policy to manifest in a hybrid form of old and new methodologies. Researchers who are used to the technology-centric mindset have not yet come to terms with the new and differentiated approach. The learning process continues, including the current period of trial-and-error.

5.2.1. The Legacy of the Previous System and Strong Dependence on Track

Social problem-solving innovation policy is experimenting with new perspectives and implementation systems. However, there is still planning and implementation centered on the science and technology community that goes on, and the perspective of shared vision between stakeholders and system innovation is still not prevalent. In particular, the participation of the civil community and stakeholders is still treated as not much more than a formality, and therefore there remains difficulty in decision-making in terms of governance that shares a long-term vision, discusses systemic problems, and creates pivoting strategy.

Recently a few social problem-solving R&D projects have been initiated, but they are still in the early stages and therefore do not clearly exhibit the outlined characteristics. This is because the actors are too used to the old way of working and there has not been enough discussion on the objectives and implementation of the new method. When the new framework is not properly set up, R&D projects will inevitably fall back to the old ways of execution, and this will increase the chances of failure. In order to avoid this, there needs to be a more experimental attitude in innovating the R&D system and working methodologies (Song et al., 2014).

5.2.2. Limitations in the Participation of Civil Society

It is still early days concerning activities for comprehending the context of social problems and the on-the-ground situation. There is some civil consensus going on but it is more at the level of collecting and analyzing simple information, not deep discussion into the context of social problems. Many committees are being run, and representatives of civil society organizations are participating, but there still is not enough profundity in such efforts (Yang, 2014). On occasions when the science and technology community and civil society convene, professional policymakers or S&T specialists are seen to lack understanding and experience in communicating with civil society or in areas outside of their purview. Civil society in turn lacks knowledge in science and technology, and due to the lack of communication with that community, they find difficulty in expressing their problems in a language that S&T specialists can comprehend. They also tend to speak from their personal perspectives rather than from one that integrates the position of civil society as a whole. Specialists or systems that can help with these communication problems are also few and far between. In other words, a system or methodology on communication and participation has not yet settled in. Of course, this is not only a problem of social problem-solving innovation R&D but an endemic issue in Korea's policy-related governance.

5.2.3. Difficulty in Linkage and Cooperation between Ministries

Difficulty in communication and coordination is also an issue between public entities. Towards the resolution of social problems, technological development and systemic reformation must be done in tandem, and the governance body that actually uses the technology must participate in the problem-solving process. There are currently committees towards collaborative coordination composed of the technological development personnel of governmental R&D entities and social policy entities, but for the most part they do no more than dividing up R&D projects to among different offices. There still is not enough depth in consideration towards cooperation for problem-solving or sharing a long-term vision of systemic transition. There also needs to be changes towards pulling forth cooperation between ministries from the early planning level onwards. A new kind of implementation system must be found under a cooperative methodology that works effectively between ministries before pursuing projects in earnest, as multi-ministry R&D programs are still in the planning stages.

6. SYSTEMIC TRANSITION AND SOCIAL PROBLEM-SOLVING INNOVATION POLICY

Social problem-solving innovation policy has become a niche for new innovation models. It aims for social innovation through the resolution of social problems by going further than just industrial innovation, and works towards innovation activity that is based on social demand. It also calls for civil society, which has been excluded in previous STI processes, to be at the center of innovation. Social problem-solving innovation policy aims for both innovation and changes in governance (Song et al., 2014).

6.1. The Formation and Development of Specialist-led Niches

The appearance of these niches was brought about under the aegis of the government and specialists. The creation of social problem-solving innovation policy as a new niche was led by S&T policy specialist groups and certain civil servants. This is the advent of a new top-down approach centered not on corporations but on a civil society and S&T researchers aiming for new innovation, as well as policy specialists in the public sphere.

The S&T policy specialist group has an affinity for science and technology studies (STS) research, and work mostly in public research institutions. They hold a critical perspective on how the innovation policy and research activity in the relevant institutions have been undertaken in the name of industrial innovation rather than the public good. They think that because global corporations have emerged and there are many new problems that cannot be resolved through corporate activity, public research institutions and by extension innovation policy must actively tackle social problems and serve the public's needs.

Civil servants for the most part are of the traditional approach, but the ones that are exploring new areas are being understood as an area where a mature STI policy can be newly expanded into. The

civil servants of this group tend to adeptly take on projects when given the responsibility. However, there is no discernible movement or group effort formed among them.

Most S&T researchers are still used to industrial innovation-based activity and tend to hold on to the old methods. They either understand social problem-solving innovation and the previous technological development paradigm as having no difference between them, or the former as being just a temporary trend. However, as topics concerning the well-being and safety of the nation are becoming more central and the research funding for such ventures increase, they have begun paying attention to developments in this direction.

The civil society and socioeconomic activities movement for social innovation arose after the close of the 2000s. Up until then, Korea's civil society organizations have focused on various social criticism and issue fighting. However, within the current prospect of social innovation, they have begun to create partnerships that actively participate in social problem-solving. These partnerships had been separate from S&T social problem-solving innovation, but recent points of contact have enabled a new movement towards the combination of S&T and social innovation. They are participating in the new niche, but their role in technology-based social innovation is not yet significant.

6.2. Niche Expansion Prospects

It is uncertain as to how far these niches being created under social problem-solving innovation can expand. However, it is becoming increasingly clear that the socioeconomic polarization, aging population, and social fragmentation Korean society is experiencing cannot be resolved merely through the previous growth-centric policy paradigm. Therefore, the movement towards S&T innovation from a social perspective will continue, and R&D funding into such areas are predicted to rise even in the face of decline in overall R&D investment.

But it will remain difficult to invigorate a new niche that goes beyond the previous framework underneath the industrial innovation paradigm that still prevails within the private sector and S&T researchers. In this respect, the newly rising alliance between civil society and socioeconomic organizations may become a catalyst for the advent of new innovation policies. In the process of directly dealing with social problems, technology and social innovation activity will combine and expand the niche, and more consideration must be put into using the political influence on the S&T community and the private sector towards the direction of social problem-solving innovation. To do this we need civil society and socioeconomic empowerment, and this requires education and training programs to enhance policy and technological skills in the civil society sector.

Additionally, S&T researchers would require the implementation of practices and systems for effective participation in this new kind of R&D activity. Social demand must be discerned, and new and experimental methods that work with users while undertaking innovation activities are also an essential component (Song et al, 2014).

7. CONCLUSION

Korea's innovation activities have traditionally focused on technology acquisition more than discovering new problems or demand. This focus was due to the importance of acquiring science and technology for the sake of developing and producing products already in use in the world market. Innovation capacity significantly increased due to such copying and renovating advanced technologies, but there was a tendency to rely on outside sources for defining specific problems and the products and systems that addressed them. While the ability to solve given problems is as developed as ever, the ability to present problems and vision is still in its early stages. This has become a stumbling block in the Korean innovation system's attempt to transition from a fast-follower to a prime mover.

Innovation for social problem-solving and innovation policy can work as a niche for innovating such systems. This is because of the approach where it is social problem-solving, not technological development, that is the goal of innovation activities. This involves defining the final user's problem, and working with the user towards solutions. This new way of working together is an opportunity for Korea's innovation system to fundamentally change its weaker points.

Innovation policy for social problem-solving is forecasted to expand. This is because Korea's social problems such as aging population, polarization of income, expansion of welfare, and climate change are set to become key policy issues. There is a call for using such large environmental changes to deal with social challenges and system innovation. Social problem-solving innovation can be the first step of such larger-scale innovation.

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