



Analyzing Korea's official development assistance strategies toward United Nations sustainable development goals: A Delphi method approach

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ABSTRACT

The Sustainable Development Goals (SDGs), as articulated by the United Nations (UN), aspire to foster a democratic society characterized by economic development, environmental stewardship, the attainment of justice, and resolution of global challenges encompassing poverty, health, and climate change. The pursuit of UN-SDGs involves the provision of official development assistance (ODA) from developed to developing countries. Nevertheless, the efficacy of such support in advancing the sustainable development objectives of developing countries remains ambiguous. This study endeavors to identify optimal strategies for Korea to contribute effectively to the realization of UN-SDGs. Employing an expert survey methodology, the research findings were subjected to analysis using the Delphi method. The consensus among experts underscores the foremost priority for Korea's ODA, which centers on 'establishing a clean water, sanitation, and hygiene system' in developing countries. Subsequently, the second priority lies in 'supporting disaster management and prevention technology,' followed by the third priority of 'providing clean energy technology and enhancing energy efficiency.' The fourth priority pertains to 'establishing educational infrastructure and programs.' Furthermore, experts concur on the importance of 'building road infrastructure and public transportation,' 'supporting greenhouse gas reduction through forest restoration,' and 'assisting in air pollution reduction' as additional critical factors for the sustainable development of developing countries. The insights derived from this study hold practical implications for the planning and execution of Korea's ODA initiatives.

Key words: Sustainable Development Goals, Climate Change, Official Development Assistance, Developing Countries, Delphi Method

1. Introduction

Greenhouse gas emissions have witnessed a rapid surge since the onset of the industrial revolution, emerging as pivotal contributors to global climate change. The ramifications of climate change have manifested in both positive and negative facets. Notably, the positive effects include the creation of new Arctic shipping routes resulting from the melting of glaciers in polar regions. Additionally, elevated temperatures have transformed high-latitude areas such as Alaska, USA, into winter recreational destinations, marked by an increased number

of ice-free lakes (Hardy, 2003; Koetse and Rietveld, 2009). While climate change has ushered in opportunities for novel industries, it has also introduced adverse consequences. Ecosystems grapple with difficulties in adapting to the swift pace of climate change, and hundreds of thousands of lives have been lost due to extreme weather events, including droughts, floods, heat waves, and cold spells attributed to climate change (Katsouyanni et al., 1997; Park, 2018, 2019, 2021). Moreover, desertification induced by climate change has precipitated water and food supply challenges in developing countries (Haines and Patz, 2004; Park, 2018,

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2019, 2021; Tol, 2009).

The genesis of climate change lies in the greenhouse gas emissions fueled by economic growth, yet the negative repercussions have become increasingly apparent. Consequently, the international consensus has shifted from mere economic growth to a paradigm of sustainable growth (Edenhofer et al., 2014; Field et al., 2014; IPCC, 2014; The Core Writing Team et al., 2014). This transformative shift is well chronicled in ‘Our Common Future,’ a report by the United Nations (UN) World Commission on Environment and Development, led by the former Norwegian Prime Minister, Brundtland, in 1987 (UN, 1987). The report crystallized the concept of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Subsequently, the UN Conference on Environment and Development in Rio de Janeiro, Brazil, in 1992 adopted the Rio Declaration and Agenda 21, an environmental action plan (Handl, 2012; Sitarz, 1993).

The global commitment to sustainable development culminated in the Millennium Development Goals (MDGs) announced by leaders of 189 countries at the Millennium Summit in September 2000, with the intention of fostering human dignity. These goals encompassed eradicating extreme poverty and hunger, achieving universal primary education, promoting gender equality, reducing infant mortality, improving maternal

health, combating diseases, ensuring environmental sustainability, and building partnerships for global development. Building upon the MDGs, a new set of objectives, the Sustainable Development Goals (SDGs), was established to be achieved between 2015 and 2030, incorporating broader aspirations for social and economic development, environmental protection, and the establishment of just and democratic societies (KoFID, 2016; Sachs, 2012). The primary objective of this study is to propose directions for Korea’s Official Development Assistance (ODA) program, contributing to the attainment of the UN-SDGs.

2. Methodology

To discern the trajectory of Korea’s Official Development Assistance (ODA) program in alignment with the United Nations Sustainable Development Goals (UN-SDGs), expert surveys were undertaken. Thirty experts were strategically chosen from research institutes, universities, and industries, all of whom possessed a wealth of experience exceeding five years in the domains of climate change and international development cooperation (refer to Table 1 for details). The expert survey unfolded across three iterative rounds. In the initial questionnaire, thirty experts participated, with subsequent rounds registering a response from only twenty-four individuals (80% response rate) in the second phase. The

Table 1. Information of survey subjects

Division	Man				Woman				Total
	30s	40s	50s	Over 60	30s	40s	50s	Over 60	
Experts from Industry									
Environmental Department	0	8	2	0	2	0	0	0	12
Global Investment Department	1	1	1	0	0	0	0	0	3
Experts from Universities									
School of Environmental Engineering	1	0	1	0	0	1	0	0	3
School of Business Administration	0	0	0	0	0	0	1	1	2
Experts from Private/Governmental Research Institute									
Environmental Department	1	0	2	1	0	1	0	0	5
Developmental Aid Department	1	2	1	1	0	0	0	0	5
Total	4	11	7	2	2	2	1	1	30

third survey was then administered exclusively to the twenty-four respondents from the second round, eliciting a response from twenty-two experts in the final iteration.

Utilizing the Delphi method, diverse expert opinions were systematically gathered (Brooks, 1979; Hsu and Sanford, 2007). The methodology extensively employed across various domains, including international development cooperation, for opinion aggregation in policy formulation (Baek and Park, 2015; Kim and Park, 2017; Okoli and Pawlowski, 2004; Park, 2022). Illustratively, Nam et al. (2022) employed the Delphi survey to discern critical success factors in fiscal information system construction projects within developing countries. In a similar vein, Lee et al. (2018) applied the Delphi method to identify enhancements in Official Development Assistance (ODA) projects in Sri Lanka, successfully pinpointing avenues for improving environmental systems, awareness, cooperation between donor and recipient countries, and project follow-up (Lee et al., 2018). Bashir et al. (2021) investigated essential qualities for implementing international development cooperation projects, employing the Delphi method to ascertain the importance of leadership, communication skills, planning skills, innovative mindset, and passion (Bashir et al., 2021).

The Delphi method employed in this study followed a structured process. The initial questionnaire solicited respondents' subjective opinions on a specific topic. Subsequently, based on the responses, the surveyor compiled a categorized list. In the second questionnaire, respondents rated the importance of items on the list, utilizing a Likert scale ranging from 1 (least important) to 5 (most important) (Likert, 1932). The third questionnaire presented respondents with the mean and standard deviation of scores for each opinion from the second round, prompting them to select the three opinions they deemed most important. This iterative process, involving three or more surveys, aimed to capture a spectrum of subjective opinions from individual respondents.

If consensus remained elusive after three surveys - wherein no opinion garnered the support of over 50% of respondents as being important - a fourth survey was

contemplated. In this scenario, results from the third survey were presented, and respondents were asked to identify important opinions. This iterative approach continued until consensus was achieved, often requiring three or four surveys (Hilbert et al., 2009; Rowe and Wright, 1999). A notable caution in employing the Delphi method was the avoidance of opinion exchange among respondents during the survey process. Such precautions were crucial to prevent potential influence from other respondents, ensuring a more accurate identification of individual subjective opinions.

3. Results and discussion

3.1. Status of official development assistance

3.1.1. Official development assistance by development assistance committee members

A substantial portion of Official Development Assistance (ODA) has been executed by member countries belonging to the Development Assistance Committee (DAC) within the Organization for Economic Cooperation and Development (OECD). The role played by DAC members in development assistance has been pivotal, with their ODA constituting a noteworthy 90% of the global ODA landscape as of 2021 (OECD, 2022a). Within this context, bilateral and multilateral ODA proportions were 70% and 30%, respectively (see Figure 1). Among DAC members, the United States emerged as the foremost contributor to ODA, followed by Germany, Japan, the United Kingdom, and France (Fig. 1). Notably, the ODA allocations from 23 out of the 29 DAC member countries increased from 2020 to 2021. The sectors targeted by ODA encompassed economic infrastructure, production, external debt service, and humanitarian assistance (OECD, 2022b). Despite the substantial contributions made by DAC members to ODA initiatives, the percentage of their ODA budget relative to their gross national income (GNI) in 2021 stood at 0.33%, falling short of the United Nations' recommended threshold of 0.7% (Lee, 2018; OECD, 2022b; Park, 2022). Our investigation delves into the Official Development

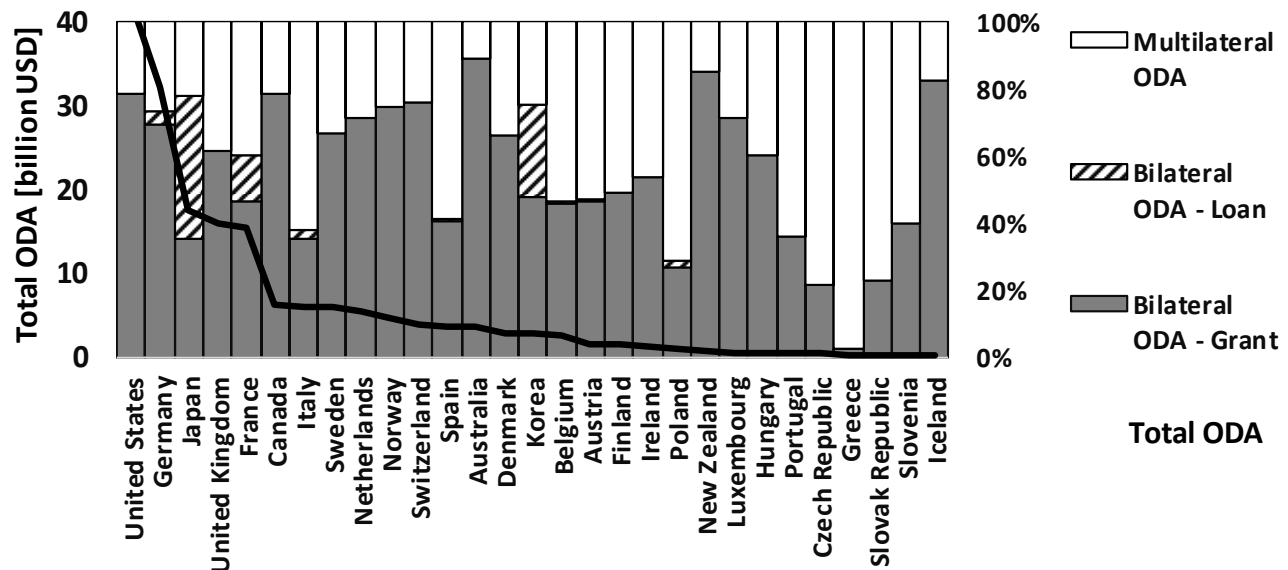


Fig. 1. Total ODA fund of DAC member countries (left axis) and the ratio of multilateral and bilateral ODA (right axis) in 2021 (reproduced using data in OECD (2022a)).

Assistance (ODA) status of key DAC members, specifically examining the roles of the United States, Germany, Japan, the United Kingdom, France, and South Korea, all of which play pivotal roles in ODA initiatives.

3.1.2. Official development assistance of the United States of America

The United States' development assistance objectives encompassed a comprehensive array, including poverty eradication, economic growth, the consolidation of democracy, elimination of discrimination and inequality, and addressing global climate change (OECD, 2023). In the U.S., the execution of Official Development Assistance (ODA) was spearheaded by the U.S. Agency for International Development (USAID) and involved collaboration with key entities such as the U.S. Department of State (USDOS), U.S. Department of Defense (USDOD), U.S. Department of the Treasury (USDT), U.S. Department of Agriculture (USDA), and U.S. Department of Health and Human Services (USHHS) (Jin, 2010).

As of 2021, the United States stood as the most

substantial contributor to development assistance among DAC members, with an ODA commitment of \$47.8 billion (OECD, 2023). Within this framework, multilateral and bilateral aid constituted 19.2% and 80.7% of the total aid, respectively. Multilateral aid was channeled through entities such as the United Nations World Food Programme (UNWFP), the United Nations International Children's Emergency Fund (UNICEF), the United Nations Development Programme (UNDP), and the World Bank. On a bilateral level, allocations were directed to Africa, Asia, and the Middle East, amounting to \$14.2 billion, \$4.4 billion, and \$3.9 billion, respectively (OECD, 2023). In the realm of bilateral aid, a predominant share was earmarked for infrastructure and services, totaling \$16.9 billion. This included allocations of \$1.0 billion for educational improvements, \$3.3 billion for supporting governments and civil society in developing countries, and \$11.4 billion for enhancing health. An additional \$1.3 billion was allocated for economic infrastructure, encompassing \$0.9 billion for the energy sector. Bilateral humanitarian assistance constituted a significant portion, totaling \$15.7 billion (OECD, 2023).

3.1.3. Official development assistance of Germany

Germany actively advanced its development assistance agenda, targeting global peace, food security, climate change mitigation, and sustainable development (Choi, 2022; Kim and Sohn, 2016). Oversight of Official Development Assistance (ODA) projects and budgets was bifurcated between the Federal Ministry for Economic Cooperation and Development (BMZ¹), responsible for ODA, and the Federal Foreign Office (AA²), which managed projects related to humanitarian assistance or peace-building (Song, 2016). Key implementation agencies included the German Agency for International Cooperation (GIZ³) and the Bank for Reconstruction (KfW⁴). GIZ oversaw technical cooperation, while KfW managed financial cooperation. Beyond government-led organizations, civil society organizations played an active role in German development assistance (Jin, 2010; Song, 2016). The German government further supported non-governmental organizations and individuals engaged in development assistance (Lim and Jung, 2017).

In 2021, Germany emerged as the second-largest contributor to development assistance among OECD DAC members, with a total ODA commitment of \$33.3 billion (OECD, 2023). Within this allocation, 23.5% constituted multilateral aid, and 76.5% was directed as bilateral aid. Multilateral aid was distributed through entities such as the World Bank, UNWFP, UNICEF, and UNDP. On the bilateral front, allocations to Africa, Asia, and the Middle East amounted to \$6.7 billion, \$5.1 billion, and \$2.8 billion, respectively (OECD, 2023). Bilateral aid of \$13.5 billion was allocated to infrastructure projects. Of this amount, \$4.0 billion, \$3.7 billion, and \$3.5 billion were designated for enhancing education, supporting governments and civil society, and improving health, respectively. Economic infrastructure received \$4.9 billion, with \$1.7 billion, \$1.5 billion, and \$0.8 billion directed to the energy, banking and finance, and industry sectors, respectively. Bilateral humanitarian assistance

constituted \$3.0 billion (OECD, 2023).

3.1.4. Official development assistance of Japan

Japan has oriented its development assistance towards poverty eradication, addressing environmental concerns, and fostering economic growth (Jin, 2010; OECD, 2023). Initially distributed across various ministries, such as the Ministry of Foreign Affairs (MOFA), the Ministry of Finance (MOF), and the Ministry of Economy, Trade, and Industry (METI), development assistance underwent consolidation under the Japan International Cooperation Agency (JICA) in 2008, a move aimed at enhancing aid efficiency (Kwon and Park, 2008).

In 2021, Japan emerged as the third-largest contributor to development assistance among OECD DAC members, with a total Official Development Assistance (ODA) commitment of \$17.6 billion (OECD, 2023). Of this, 18.9% constituted multilateral aid, while 81.1% was channeled as bilateral aid. Multilateral aid was extended through entities such as the World Bank and Regional Development Banks, UNICEF, UNDP, and UNWFP. On the bilateral front, allocations to Asia, Africa, and the Middle East amounted to \$10.1 billion, \$2.4 billion, and \$0.9 billion, respectively. Notably, the proportion of loans in bilateral aid from Japan exceeded that of grants, as illustrated in Figure 1 (Jin, 2010). Japan directed \$5.5 billion of its bilateral aid towards economic infrastructure and services, encompassing allocations of \$1.8 billion, \$1.2 billion, and \$0.5 billion for health improvement, water and sanitation, and education, respectively. Humanitarian assistance within bilateral aid amounted to \$0.95 billion (OECD, 2023).

3.1.5. Official development assistance of the United Kingdom

The UK's international development strategy prioritized sustainable development, women's rights, humanitarian assistance, and efforts addressing climate change and

1) Abbreviation of 'Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung' in Germany

2) Abbreviation of 'Auswärtiges Amt' in Germany

3) Abbreviation of 'The Deutsche Gesellschaft für Internationale Zusammenarbeit' in Germany

4) Abbreviation of 'The Kreditanstalt für Wiederaufbau' in Germany

environmental issues (OECD, 2023). Until 2010, the execution of development assistance rested with the Department for International Development (DFID), while diplomatic functions were conducted by the Foreign and Commonwealth Office (FCO). In a move aimed at enhancing the efficacy of development aid, DFID and FCO were amalgamated into the Foreign, Commonwealth & Development Office (FCDO) in 2010. While the FCDO assumed responsibility for development policy and budget execution, the UK maintained headquarters for development activities in 22 developing countries and coordinated with 67 organizations involved in practical development projects. Annual reporting to the Cabinet under the International Development Reporting and Transparency Act of 2006 ensured transparency regarding the allocation of funds for Official Development Assistance (ODA) (KIP, 2021).

In 2021, the UK's total ODA reached \$15.7 billion, establishing it as the fourth-largest contributor to development assistance among OECD DAC members (OECD, 2023). Of this, 39.5% constituted multilateral aid, while 60.5% was allocated as bilateral aid. Multilateral aid was distributed through EU institutions, the World Bank, UNICEF, UNDP, and UNWFP. On a bilateral level, allocations to Africa, Asia, and the Middle East amounted to \$2.4 billion, \$1.3 billion, and \$0.7 billion, respectively (NIA, 2007; OECD, 2023). The UK earmarked \$1.4 billion of its bilateral ODA for economic infrastructure and services, focusing on areas such as health improvement and education. Bilateral humanitarian assistance amounted to \$0.59 billion (OECD, 2023).

3.1.6. Official development assistance of France

France's development assistance priorities encompass international stability, climate change action, education, gender equality, and international health. The enactment of the Law on Inclusive Development and Combating Global Inequalities (Programming Act No. 2021-1031) in 2021 delineates specific focus areas for development assistance (OECD, 2023). The French Development Agency (AFD) and France's healthcare strategy specifically concentrate on enhancing maternal and child

health, managing infectious diseases, supporting hospital health systems, and providing digital healthcare within the ambit of development assistance (IDHS, 2023).

In 2021, France ranked as the fifth-largest contributor to development assistance among OECD DAC members, with a total Official Development Assistance (ODA) commitment of \$15.5 billion (OECD, 2023). Multilateral and bilateral aid constituted 33.9% and 66.1%, respectively. Multilateral aid was channeled through EU institutions to developing countries. On the bilateral front, allocations of \$4.7 billion, \$2.2 billion, and \$1.7 billion were directed to Africa, Latin America, and Asia, respectively (OECD, 2023). France allocated \$5.2 billion of its bilateral aid to economic infrastructure and services, with specific amounts of \$1.7 billion, \$1.0 billion, and \$0.96 billion allocated for education, health, and water and sanitation, respectively. Bilateral humanitarian assistance totaled \$0.82 billion (OECD, 2023).

3.1.7. Official development assistance of Korea

While South Korea currently stands as one of the largest contributors to Official Development Assistance (ODA), it was once a recipient country in the 1940s. Korea began receiving aid in 1945, primarily focused on reconstruction, rehabilitation, and food until the 1950s (KOICA, 2011a). By 1961, South Korea had a Gross National Production (GDP) per capita of \$89.0/year, ranking 101st out of 125 countries. However, a remarkable transformation occurred, and by 1975, the GDP per capita had surged to \$520, surpassing the soft loan threshold (KOICA, 2011a). South Korea successfully repaid its World Bank loan in 1995 (KOICA, 2021a), thereafter demonstrating a strong commitment to supporting developing countries. In 1987, the Korean government established the Overseas Economic Cooperation Fund, followed by the creation of the Korea International Cooperation Agency (KOICA) in 1991, both aimed at expanding support for developing countries (KOICA, 2021a; Sohn et al., 2014).

Korea joined the OECD in 1996 and became a member of the OECD Development Assistance Committee (DAC) in 2010. In 2010, the Korean government enacted the

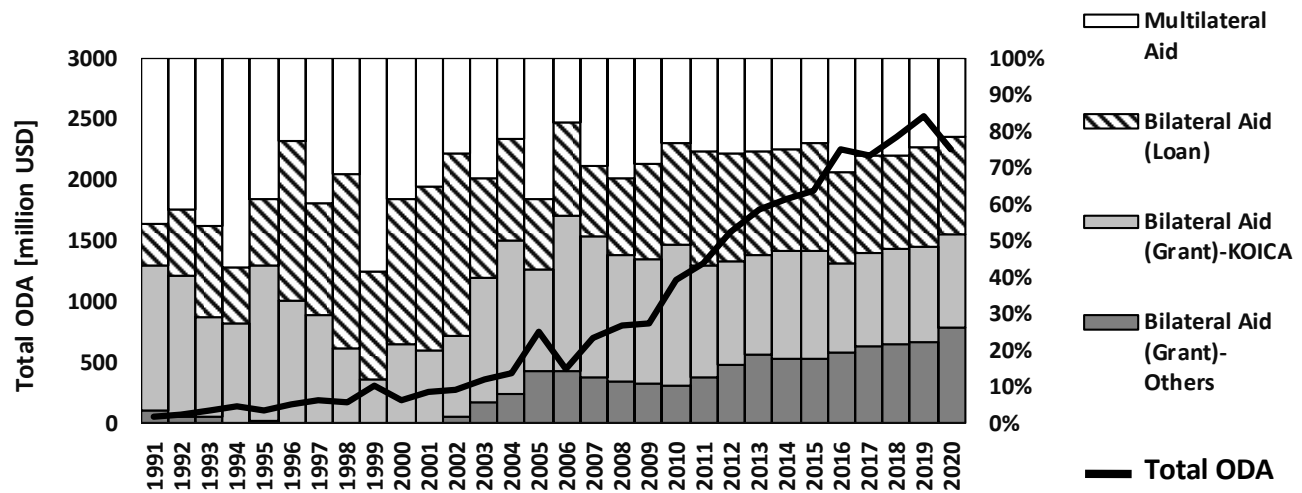


Fig. 2. Annual ODA fund (left axis) and the ratio of multilateral and bilateral aid (right axis) from 1991 to 2020 in Korea (reproduced using data in KOICA (2011a, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021b)).

Basic Law for International Development Cooperation (IDC), subsequently formulating a basic plan for the IDC framework every five years since 2011 (ME, 2006, 2011, 2016, 2021; MOEF, 2010; ODA Korea, 2015, 2021). The First International Development Cooperation Framework Plan for 2011-2015 prioritized humanitarian assistance toward achieving the UN Millennium Development Goals. The Second Plan from 2016 to 2020 emphasized integrated strategies and plans aligned with the UN Sustainable Development Goals (SDGs) and expanded stakeholder participation. The Third Plan from 2021 to 2025 envisions achieving mutual benefit between nations through global cooperation (ODA Korea, 2021).

South Korea's ODA has steadily increased, totaling \$2.9 billion as of 2021, with 22.3% and 77.7% allocated to multilateral and bilateral aid, respectively (OECD, 2023). Within bilateral aid, grants accounted for more than 60%, while loans constituted less than 40% (Figure 2). KOICA managed approximately half of the bilateral ODA funding, with 60% directed to Asia and Africa, followed by allocations to Latin America, the Middle East, and the CIS. Approximately 80% of the total budget was allocated to education, healthcare, public administration, agriculture, forestry, fisheries, technology, environment and energy, and emergency relief (KOICA,

2021b).

3.2. Areas of official development assistant of Korea towards United Nations sustainable development goals based on Delphi study

The global budget allocated to Official Development Assistance (ODA) has experienced a significant increase over recent decades. Despite this substantial support, discernible impacts on the sustainable development of developing countries have not been evident. Consequently, the imperative to identify ways to optimize the efficacy of ODA became evident. Through an expert survey (Table 2), specific areas of ODA where Korea could effectively contribute to the United Nations Sustainable Development Goals (UN-SDGs) were delineated.

In the initial survey, participants were queried regarding ODA projects that Korea could adeptly undertake to support the UN-SDGs. From the diverse array of opinions presented, akin responses were consolidated into seven distinct projects (Table 2). Subsequently, the second survey presented these seven consolidated opinions to respondents, who were tasked with indicating the perceived importance of each project

Table 2. ODA projects of Korea effective to support UN–SDGs

No.	First survey results	Second survey results*	Third survey results**
1	Establishing a clean water, sanitation, and hygiene system	4.3 ± 0.8	77%
2	Supporting disaster management and prevention technology	3.9 ± 1.1	55%
3	Providing clean energy technology and enhancing energy efficiency	3.7 ± 1.0	50%
4	Establishing educational infrastructure and programs	3.6 ± 1.0	50%
5	Building road infrastructure and public transportation	3.3 ± 0.8	36%
6	Supporting greenhouse gas reduction through forest restoration	3.6 ± 1.0	23%
7	Assisting air pollution reduction	2.9 ± 1.0	9%

* Mean ± SD (max: 5); ** Totals are equal to 300% since each respondent selected projects

on a Likert scale ranging from 1 (least important) to 5 (most important). The basic statistical metrics derived from the second survey, such as mean and standard deviation, were then provided to respondents in the third survey. Herein, participants were asked to select the three projects they deemed most significant (Table 2).

According to the survey, the highest priority, selected by 77% of respondents in the third round, was the ‘establishing a clean water, sanitation, and hygiene system.’ Despite decades of extensive efforts to address global water challenges through various means, a significant portion of the population still lacks access to clean water and adequate sanitation. This issue persists, particularly for individuals residing near the Sahara Desert in Africa and in various Asian regions, including Cambodia, Myanmar, Laos, and Mongolia (Kim, 2021). To address this challenge, it is imperative to support the supply of managed water by transferring Korea’s advanced water management technology. In pursuit of this goal, the transfer of advanced technologies for water sanitation facilities is essential, accompanied by continuous support to empower developing countries to maintain these facilities independently. Korea’s technical

expertise in water ODA has been widely recognized (KOICA, 2011b). Notably, a significant proportion of ODA projects proposed to Korea are focused on the water sector, reflecting the high expectations that developing countries place on Korea’s water management technologies (Lee, 2016). To ensure that ODA effectively contributes to the sustainable development of recipient countries, it is recommended that the transfer of advanced technology should be complemented by related political cooperation. Identifying the political and economic status of the recipient country is crucial to providing effective support for sustainable development in developing countries (Lee et al., 2018).

The second focal area identified was ‘supporting disaster management and prevention technology,’ deemed important by 55% of respondents. Extreme weather events, including floods, droughts, and typhoons, are attributed to climate change. Developing countries are often disproportionately affected by climate change compared to developed countries, given their limited capacity to respond effectively to climate-induced phenomena (Lim, 2011). The repercussions of natural disasters extend beyond human casualties, impacting basic industries such as agriculture and fisheries, thus hindering economic development. While developing countries have implemented various measures to address these challenges, such as Cambodia’s efforts to manage floods through dike construction and enhanced disaster forecasting systems, and the Philippines’ initiatives to minimize damage through early warning systems, the impact of natural disasters persists. India, too, actively educates its citizens to cope with the impacts of flooding (Yoo et al., 2011). Given the ongoing challenges, it is crucial to assist developing countries in preventing and mitigating the effects of disasters and catastrophes. To this end, it is recommended that Korea supports advanced meteorological observation and forecasting systems. This involves the development of real-time monitoring and early warning systems achieved by integrating accumulated disaster-related data with information and communication technologies. Such support is essential to enhance the resilience of developing countries against the

adverse impacts of natural disasters.

The third and fourth priorities were identified as 'providing clean energy technology and enhancing energy efficiency' and 'establishing educational infrastructure and programs.' These two categories were selected by 50 percent of respondents in the third survey, with the former scoring higher than the latter in the second survey. Consequently, 'providing clean energy technology and enhancing energy efficiency' was designated as the third-highest priority project.

Given that many developing countries are situated in subtropical regions near the equator, the effectiveness of renewable energy systems, such as photovoltaic power generation, is heightened in these low latitude areas. The introduction of renewable energy systems holds the potential for a significant reduction in greenhouse gas emissions. However, clean energy systems are not widely utilized in developing countries (Han, 2010; Kim and Park, 2017; Park et al., 2016). It is suggested to expand clean energy facilities, including renewable energy systems, not only for the economic advancement of developing countries but also to contribute to the mitigation of global climate change. The provision of energy storage devices, such as batteries, is essential to ensure stable electricity supply generated by renewable energy systems. Once a stable supply of clean energy is achieved, the integration of clean vehicle systems, such as electric vehicles, and electricity charging systems becomes more feasible. Additionally, the prevalence of energy-inefficient buildings in developing countries is relatively higher than that in developed countries (Cantore et al., 2016; Zhang et al., 2011). Therefore, there is a need to promote the development of green buildings to enhance energy efficiency in these regions.

The fourth priority focused on 'establishing educational infrastructure and programs.' In many developing countries, children and women are frequently marginalized in the realm of education. The education of women not only contributes to improving their social status but also aids their children in pursuing higher education, fostering positive impacts on community and sustainable development in developing countries (Chang,

2020; Le and Nguyen, 2020; Lee et al., 2018). To address this, the suggestion is to expand learning opportunities for students in areas with limited access to education by providing essential resources such as classrooms, libraries, and educational equipment like school supplies and computers. Moreover, the proposal includes the implementation of training programs for teachers, continuing education initiatives for adults, and the development of online education programs. Lastly, establishing and nurturing ongoing partnerships with communities in developing countries is deemed essential to monitor and enhance both educational infrastructure and programs.

Opinions endorsed by less than 50% of the respondents in the third survey were classified as minor opinions. Among these, 'building road infrastructure and public transportation' garnered support from 36% of respondents. Infrastructure serves as the cornerstone for industrial and economic growth in developing countries, additionally aiding in the reduction of greenhouse gas emissions by diminishing energy consumption (Bang and Kang, 2018). Other minor opinions included 'supporting greenhouse gas reduction through forest restoration,' which was selected by 23% of respondents in the third survey. The deforested areas become more vulnerable to various disasters and hazards, such as landslides. Therefore, there is a need to support developing countries through reforestation and afforestation. Finally, nine percent of the respondents indicated the importance of 'assisting air pollution reduction' in developing countries. Offering advanced air pollution treatment facilities from Korea, such as high-performance fine dust filter manufacturing technology, was suggested to reduce air pollution in developing countries.

4. Conclusions

Effective strategies for Korea to contribute to UN-SDGs were identified through an expert survey. The survey underscored that the top-priority area was the 'establishment of a clean water, sanitation, and hygiene system.' This necessitated the provision of advanced

Korean water treatment facilities and the transfer of knowledge and experience. The second priority was ‘providing disaster management and prevention technology,’ for which Korea’s advanced meteorological observation and prediction systems could assist in establishing disaster prediction systems. The third priority was ‘providing clean energy technology,’ requiring the development of energy storage devices for the stable supply of electricity through clean energy sources. The fourth priority was ‘establishing educational infrastructure and programs,’ emphasizing support for the education of women and children without access to educational opportunities.

Additional considerations, categorized as minor opinions, encompassed ‘supporting road infrastructure and public transportation,’ ‘supporting greenhouse gas reduction through forest restoration,’ and ‘assisting air pollution reduction.’ The ODA projects proposed in this study serve as a foundational framework for shaping Korea’s ODA policy, particularly for large developing countries. Limitations of this study include the restricted number of respondents, and it is acknowledged that survey results may vary based on the specialty, profession, gender, or age of participating experts. Future research could benefit from expanding the respondent pool and conducting a demographic analysis of survey results to enhance the comprehensiveness of the findings.

Acknowledgement

This paper was supported by the Research Fund, 2023, Pyeongtaek University in Korea.

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