Since the Republic of Korea’s (Korea) membership of IIASA began in 2008, a range of research collaborations and capacity building activities have been developed by IIASA and 18 Korean research partners. Studies have explored green growth in Korea, global water challenges, and how to increase Korea’s resilience to extreme events among a range of other topics. Most of the research has also advanced Korean capacity to use and develop the tools of systems analysis such as building a Korean version of IIASA GAINS model that has helped governments across the globe to cut air pollution and greenhouse gas emissions in the most cost-effective manner. In addition, fourteen young Korean scientists have gained international and interdisciplinary research skills after winning places in IIASA programs for young scientists. These activities are complemented by significant scientific exchange with researchers either visiting Korea from IIASA or visiting IIASA from Korea over 180 times. However, significant potential remains to enhance the mutually beneficial relationship between IIASA and Korea through establishing new collaborations, new partnerships, and increasing capacity building activities. This IIASA Info Sheet provides a summary of this expanding relationship since 2010.

### Highlights of Interactions Between IIASA and the Republic of Korea

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<th>National Research Foundation of Korea</th>
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<td>Membership start date</td>
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<td>Key research partners</td>
<td>18 Korean organizations have collaborated with IIASA including:</td>
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<td>- Greenhouse Gas Inventory and Research Center of Korea (GIR)</td>
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<td>- Korea Advanced Institute of Science and Technology (KAIST)</td>
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<td>- Korea University</td>
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<td>Other interactions</td>
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<td>Researchers, advisors, and diplomats from Korea have visited IIASA over 45 times, while IIASA scientists have visited Korea over 145 times</td>
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Activities with Member Countries: Republic of Korea

IIASA Info Sheet 2019/04
May 2019

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Prepared by
External Relations, Communications, and Library Department
IIASA, Schlossplatz 1, A-2361 Laxenburg, Austria
E-mail: externalrelations@iiasa.ac.at

IIASA Info Sheets provide succinct summaries about IIASA activities. They do not necessarily reflect the views of IIASA staff, visitors, or National Member Organizations.

This Info Sheet summarizes IIASA recent interactions with Korea. It includes highlights with links to further information, but it is not a comprehensive report on all interactions.

Feedback and updates are encouraged and should be sent to the External Relations Department.
IIASA National Member Organization in the Republic of Korea

The National Research Foundation of Korea (NRF) is the National Member Organization (NMO) representing Korean membership of IIASA as well as funding IIASA’s annual membership fee. Korean membership began in 2008.

Dr. Kil-Choo Moon, President, University of Science and Technology (UST), is the IIASA Council Member for Korea. Along with the representatives of each of IIASA member countries, he sits on the IIASA Council and is responsible for setting the overall strategic direction of the Institute as well as governing IIASA.

Dr. Yeun-Soo Choi, Office Director, Office of Global Networks, National Research Foundation of Korea (NRF)

IIASA was established in 1972 to use scientific cooperation to build bridges across the Cold War divide and research growing global problems on a truly international scale. Today the soft power of science diplomacy continues to help IIASA member countries through using scientific cooperation to improve international relations, and through international teams jointly researching controversial issues to find consensus such as through integrative assessments of the future for the Arctic or of the economic integration of Eurasia.

In addition, IIASA also maintains its original bridge-building objective through attracting member countries that represent a range of geo-political interests (see full list of members: Back page). For instance, both Russia and the US are members; as are Brazil, China, India, and South Africa. Several key factors also unite all IIASA member countries: their interest in systems analysis, scientific and academic infrastructure, economic stability and the geopolitical role in future global transitions. With this in mind, IIASA negotiated membership with Iran and Israel.

The National Research Foundation of Korea represents the Republic of Korea and its scholarly community on the IIASA governing Council

Web: [www.nrf.re.kr](http://www.nrf.re.kr)
IIASA works with research funders, academic institutions, policymakers, and individual researchers in Korea. The following list includes the names of the organizations and individual researchers’ affiliated institutions that have recently collaborated with IIASA.

- Greenhouse Gas Inventory & Research Center of Korea (GIR)
- Green Technology Center Korea (GTCK)
- Keimyung University
- Konkuk University (KU)
- Korea Advanced Institute of Science and Technology (KAIST)
- Korea Energy Economics Institute (KEEI)
- Korea Environment Institute (KEI)
- Korea Forest Research Institute (KFRI) (see NIFoS, below)
- Korea University
- Korea Water Forum (KWF)
- Ministry of Foreign Affairs
- Ministry of Land, Infrastructure and Transport
- National Institute of Environmental Research (NIER)
- National Institute of Fisheries Science (NIFS)
- National Institute of Forest Science (NIFoS), formerly Korea Forest Research Institute (KFRI)
- Presidential Committee on Green Growth (PCGG)
- Pukyong National University
- Science and Technology Policy Institute (STEP)
- Seoul National University

IIASA is continually developing collaborations with Korea and has recently been working with 18 organizations in Korea via formal and informal connections.
Recent Research Collaborations

Smart ways to clean up Korea’s air

IIASA GAINS model is a scientific tool that has been helping policymakers and researchers across the globe to select a smart mix of measures to simultaneously cut multiple air pollutants and greenhouse gas emissions. Experience from Europe, whose policymakers use GAINS, shows this multiple pollutant approach is the most cost-effective.

Since 2013, with researchers from Konkuk University and funding from the National Institute of Environmental Research of Korea, IIASA has been developing the GAINS model for Korea. The resulting model will help policymakers in Korea to investigate synergies between measures that reduce air pollution and that mitigate greenhouse gas emissions, and so contribute to developing an integrated policy that manages air quality and tackles climate change.

Earlier studies with researchers from Seoul National University and other Asian institutions carried out a comparative study of different regional models of air pollutants in Asia.

Six shocks and Korea

IIASA and Korean researchers are collaborating in the “Six Shocks and Korea” project to study the vulnerabilities and sources of resilience of the Korean economy and society to the following six shocks:
- a collapse of the internet,
- a radical change in the price of energy,
- a concealed nuclear accident in a neighboring country,
- a food crisis,
- a pandemic, and
- a discontinuous transition in retirement age (up to 75 years).

The joint study with the Science and Technology Policy Institute (STEPI) has also compared the resilience of Korea with Finland to these extreme events. STEPI researchers have used the results to advise both the Prime Minister’s Office and Presidential Office. Subsequently, the Parliament of Korea requested to continue the project with an in-depth study of associated uncertainties, and collaboration between IIASA and STEPI was formalized through a Memorandum of Understanding signed in July 2014. This has resulted in, among other activities, the development of an agent-based modeling tool to enable policymakers in Korea to experiment with different shock scenarios and policy parameters, and so identify the most effective policies.

Research to support green growth in Korea

Korea is at the forefront of green growth initiatives and has published a National Strategy for Green Growth for the period 2009–2050. The following research collaborations between IIASA and Korean researchers have contributed to this strategy:
- With the Greenhouse Gas Inventory & Research Center of Korea (GIR) and the Korea Forest Research Institute (KFRI), IIASA embarked on a scientific analysis to underpin new policies that aim to transform Korea to a low carbon green economy by 2050. The aim of the project is to provide specific information for Korea’s future as well as serving as a test case for a new brand of greenhouse gas mitigation modeling that extends detailed and multi-faceted analysis far enough into the future to be useful for planning.
- Building on collaborations between IIASA energy experts and researchers at the Korea Advanced Institute of Science and Technology (KAIST), joint studies are looking at green technology diffusion and deployment.
Analyzing global water challenges

Progress toward meeting global water challenges has not been enough: 770 million people lack access to improved sources of drinking water, and 35 million die prematurely each year from water-related diseases. In 2013 IIASA launched a new futures initiative, Water Futures and Solutions (WFaS), to conduct an integrated analysis of global water challenges and solutions. The Ministry of Land, Infrastructure and Transport of Korea is a founding partner of this initiative, which presented its work at numerous events during the 7th World Water Forum in Daegu, Gyeongbuk, in 2015 and aims to publish major outputs at the 8th World Water Forum in Brazil in 2018. Senior representatives from Korea’s Ministry of Land, Infrastructure and Transport; the Ministry of Foreign Affairs; and the Korea Water Forum have also participated in the WFaS launch meeting and the subsequent interim WFaS governing board meeting.

Improving forest management in Korea

A partnership between IIASA, the Korean Forest Research Institute (KFRI), and the International Union of Forest Research Organizations (IUFRO) is improving the protection of Korea’s forests from fire. An expert in forest and wild land fire research from KFRI worked at IIASA from 2012–2014 to develop a fire weather index at national and regional level for Korea with a link to a global forest fire early warning system. This collaboration is a result of the Memorandum of Understanding signed by IIASA and KFRI to develop long-term international partnerships for forest research.

Other forest collaborations include:

- Studies into the potential for bioenergy in combination with carbon capture and storage (BECCS) in Korea as a source of energy with a negative greenhouse gas emission footprint (see IIASA models, tools, and data, below).
- The initial stage of a collaboration with Korea University into the ecosystem value of forests in the Republic of Korea and afforestation efforts and their implications in the Democratic People’s Republic of Korea.

Many of today’s most pressing challenges extend beyond international borders. IIASA research areas such as climate change, water scarcity, and poverty are affected by multiple factors across the globe. In turn, these global problems have impacts on nations, regions, and continents. Finding long-lasting solutions to these challenges requires scientific expertise that is free from the interests of a single nation. IIASA’s National Member Organizations recognize this need and their investment in IIASA is a contribution to a global public good. The benefit of this contribution is paid back to global researchers, policymakers, and citizens in multiple ways, as the following examples show:

- IIASA supports the climate change research community by hosting the Representative Concentration Pathways (RCP) database. The database provides data on greenhouse gas emissions for four different future scenarios that underpin the analysis of thousands of climate change researchers. IIASA also calculated the data for one of the scenarios, all of which have been developed for the world’s most comprehensive analysis of climate change—the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report.
- IIASA research provides scientific guidance to the Convention on Long-range Transboundary Air Pollution of the United Nations Economic Commission for Europe. This international environmental treaty between 33 countries has slashed air pollution in Europe, improving people’s health and countries’ crop production. IIASA GAINS model guided negotiators and policymakers as they worked on the treaty to identify the most cost-effective approach to cleaning Europe’s air. The negotiators chose the GAINS model not only because of its accuracy and usability but also because it had been developed by an international team with funding from multiple countries, which assured them that the model was nationally unbiased.
The participation of a team of IIASA forest experts in the IUFRO World Congress XXIII in Seoul in 2010. Presentations examined the role of forests in maintaining the Earth’s ecosystems and the tools needed for advanced integrated forest management.

A study into the impact of climate change on food security in East Asia, including Korea, by assessing the implications for the competition for land between the agriculture, bioenergy, and forestry sectors using IIASA GLOBIOM model.

The future of fisheries

Seafood is the primary source of animal protein for more than one billion people. Many developing nations and coastal communities depend on fisheries. However, expanding food production from fisheries is hindered by rampant overfishing and changes in marine habitats. By combining fields of expertise as diverse as population genetics, evolutionary theory, and fisheries science, IIASA researchers have been analyzing the consequences of commercial fishing practices on the evolution of fish. Collaborations with Korea include:

- Joint studies with researchers at Pukyong National University into the growth and maturation of Korean chum salmon under changing environmental conditions.
- Ongoing collaborations with a researcher at Korea’s National Institute of Fisheries Science into implementing sustainable and ecosystem-based fishery management for Pacific sardine.

Related research, with collaborators at Pusan National University, is developing eco-evolutionary models to analyze how aquatic insects in rivers adapt to changes in their environment such as water quality or stream flow.

Through intense data gathering, computer modeling, and other advanced research methods, IIASA provides a country’s researchers and their policymakers with the essential numbers and tools to select the most effective policies. For example:

- One of the current targets of the Republic of Korea’s National Energy Plan is to increase the bioenergy share in total energy production from 0.2% in 2007 to 3.4% by 2030. Recent IIASA research has shown that via sustainable biomass extraction, Korea could produce around 10% of its present heat demand (equivalent to a 20-fold increment in the current bioenergy share for heat production in Korea), and 1.3% of the total electricity produced in South Korea (15 times the present bioenergy share for electricity production). The study also identifies the most efficient location and size for these bioenergy facilities, and that there is potential to capture and store carbon dioxide emissions from around 3–4% of the total demand for heat energy resulting in negative emissions of greenhouse gases. Source: IIASA’s BeWhere and G4M models and published in: Kraxner F, Aoki K, Leduc S, Kindermann G, Fuss S, Yang J, Yamagata Y, Tak K, Obersteiner M (2014). BECCS in South Korea—Analyzing the negative emissions potential of bioenergy as a mitigation tool.

Many of the research projects summarized in this Info Sheet draw on analyses from IIASA models, tools, and data including:

- Reducing air pollutants and greenhouse gas emissions simultaneously (GAINS model)
- Planning a sustainable energy system (MESSAGE model, Global Energy Assessment Scenario Database)
- Finding the optimal location, size, and technology for bioenergy production plants (BeWhere model)
- Reducing energy poverty (Energy Access Interactive Tool—ENACT)
- Improving food security through identifying yield gaps (GAZE model) and assessing competition for land use between agriculture, bioenergy, and forestry (GLOBIOM model)
- Comparing incomes from forestry and alternative land uses (Global Forest Model—G4M)
- Financial disaster risk management (CATSIM model)
- Projecting future population (Demographic multistate modeling)
Advancing energy and integrated assessment modeling in Korea

Korean national interests are integrally connected to complex global systems that impinge on the country’s economy, energy systems, and climate. A 2009–2012 IIASA collaboration with the Korea Environment Institute and other global partners has improved energy and integrated assessment modeling and thereby contributed to Korea’s strategic research base by enhancing modeling knowledge and skills. The international collaboration between multiple modeling teams made a global model comparison of 23 energy–economy and integrated assessment models in order to better articulate Asia’s role in mitigating climate change—crucial given the growing economic relevance of Asia in the world and its energy and environmental impacts.

From 2006–2012 IIASA led the Global Energy Assessment (GEA), which defines a new global energy policy agenda that transforms the way society thinks about, uses, and delivers energy. The GEA involved over 500 specialists from a range of disciplines, industry groups, and policy areas, to identify pathways and policies to facilitate equitable and sustainable energy services for all:

- Korea was a contributor to the GEA with four researchers, from institutes ranging from the Korea Energy Economics Institute to Keimyung University, contributing to or reviewing the assessment.
- Outcomes from the GEA included the adoption of GEA’s findings as the three key objectives of the UN Secretary-General’s Sustainable Energy For All (SE4All) initiative on energy access, energy efficiency, and renewable energy.

Business can benefit from science through the analysis and knowledge it provides. In turn, science can benefit from business through its experience on the ground and in implementation. IIASA also recognizes that closer collaboration between business and its researchers can increase the impact of the Institute’s work. Not surprisingly, IIASA is seeing a growing number of contracts with commercial partners, including:

- The global insurer, Zurich Insurance Group, began working with IIASA in 2013 to identify and address research gaps on flood resilience and community based disaster risk reduction, demonstrate the benefits of pre-event risk reduction over post-event disaster relief and to improve public dialogue around disaster resilience.
- The German carmaker, Daimler AG, has collaborated with IIASA researchers to assess biofuel potential from marginal and degraded lands in India and Brazil.
- The Brazilian energy company, Petrolero Brasileiro, was one of nineteen sponsors of IIASA’s Global Energy Assessment.
- The research institute of the Japanese carmaker, Toyota, has an ongoing collaboration with IIASA to research measures to reduce ozone emissions in Asia.
- The multinational consumer goods company, Unilever, funded IIASA’s agricultural experts from 2008–2010 to analyze yields and land suitability of key agricultural crops under a changing climate.

In addition, IIASA is exploring ways that it can work more closely with multinational corporations, including through input to the development of their global sustainable business plans.
**Projecting changing population and human capital in Korea**

IIASA demographers study and project the changing composition of population for all countries of the world. They produce one of the few independent alternatives to the demographic projections of the UN Population Division. As a testament to the quality of IIASA demography research, in 2011 the Intergovernmental Panel on Climate Change (IPCC) adopted IIASA population projections as its source data in all modeling for the IPCC Fifth Assessment Report; and UNESCO has adopted IIASA demographic methods as part of its literacy forecasting.

The Institute’s interdisciplinary setting has encouraged its demographers to research beyond the traditional boundaries of demography and to explore how changes in society, economy, and the natural environment influence the health and mortality, migratory patterns, and reproductive behavior of human society.

A recent innovative example of this broader approach has been the development of research methods to project population by level of education. This equips researchers with the tools to explore the implications of different education policies on a country’s future fertility, life expectancy, migration, and population level as well as economic growth and ability to adapt to climate change. In 2014 IIASA published the first projections of educational attainment by age and sex for 195 countries with Oxford University Press. Findings for the Republic of Korea show how different policies over the next few decades could lead to the country’s 2010 population of 48.2 million remaining fairly stable at 50.3 million by 2060 or falling to around 36 million.

IIASA research is underpinned by high-quality science, which is regularly published in high impact publications. A selection of recent publications is presented here; a complete list can be found in Appendix 4.

Since 2010 14 Korean students have developed research skills and networks by taking part in the IIASA Young Scientists Summer Program

## Capacity Building

### Young Scientists Summer Program

The Young Scientists Summer Program (YSSP) develops the research skills and networks of talented PhD students. Program participants conduct independent research within the Institute’s research programs under the guidance of IIASA scientific staff. Since 2010 the following 14 Korean students participated in this program, with funding provided through IIASA Korean National Member Organization unless otherwise stated:

**YSSP’19**

**Yuyoung Choi** (Korea University), studied assessing synergies and trade-offs between biodiversity conservation and carbon stock under climate change in South Korea

**YSSP’18**

**Sungeun Cha** (Korea University), researched improving spatial distribution of forest carbon stock estimation using Convolutional Neural Network (CNN) Classification

**Hyunjae (Jay) Kang** (Stony Brook University), a Korea National, studied dynamics of interaction between human capital and demographic structure, and its effects on economic growth

**YSSP’17**

**Cholho Song** (Korea University), studied an enhanced approach to assessing forest ecosystem functions and ecosystem services under land cover changes in South Korea

**YSSP’15**

**Sunyong Sung** (Seoul National University) estimated carbon stock changes considering vegetation shift and land use change for the Korean Peninsula. (Funded by Korean NMO).

**YSSP’14**

**Moonil Kim** (Korea University) improved an existing forest resource forecasting model by developing the model’s capacity to make quantitative forecasts on how forest management affects forest resources and the model’s capacity to make quantitative forecasts on how climate change affects forest growth among different tree species. (Co-funded by IIASA and Korea University)

**Younha Kim** (Konkuk University) investigated the effectiveness of the Seoul Metropolitan Area’s Air Quality Management Plan (SAQMP) using the GAINS-Korea framework under development at IIASA.

**YSSP’12**

**Ki Chul Choi** (Konkuk University) assessed the impact of emission reductions of sources on air quality in regions of South Korea and East Asia.

**Joung-Hun Lee** (Kyushu University), a Korean national, used game-theoretical models to analyze the illegal harvesting of forest trees and explore approaches to reduce such illegal logging. (Co-funded by IIASA and Kyushu University)

**Kyeongah Nah** (University of Szeged), a Korean national, used adaptive dynamics theory to understand the bimodality observed in malaria incubation times. (Co-funded by IIASA and University of Szeged)

**Sam Hyun Yoo** (Arizona State University), a Korean national, investigated the impact of female education on the process of childbearing postponement and recuperation in Korea. (Funded by IIASA’s Annual Fund)
YSSP’11

Mun Su Lee (Sungkyunkwan University) studied the climate and energy security impacts of alternate energy futures for developing countries in Asia and what this implies in terms of policy costs and the required levels of technological deployment and demand management.

Roktaek Lim (YSSP’10 & Seoul National University) developed a simple life-history model of the growth and decline of the global catch of anchovy and sardine to reveal the mechanisms that are causing the observed long-term cycles of these fish.

Tuyen Van Nguyen (Pusan National University) used an eco-evolutionary model to analyze how certain aquatic organisms respond to external environmental disturbances such as oxygen, temperature, and pollution. (Funded by the German NMO)

Regional Young Scientists Summer Program

In 2012 IIASA launched the first expansion of its successful YSSP with the Southern African Young Scientists Summer Program (SA-YSSP) at the University of the Free State in Bloemfontein, South Africa. The program was organized jointly by IIASA and three South African partners: the National Research Foundation (NRF), the Department of Science and Technology, and the University of the Free State. In a competitive selection process, one doctoral student from the Republic of Korea was awarded a fellowship to take part in the program:

Kyeongah Nah (SA-YSSP’12/13 & University of Szeged), a Korean national, extended her previously developed model for predicting malaria incubation times under latitudinal and climate-induced changes in season lengths. (Funded by NRF)

Postdoctoral Program

Postdoctoral researchers at IIASA work in a rich international scientific environment alongside scientists from many different countries and disciplines. The Institute’s research community helps its postdoctoral researchers to develop their research from fresh angles, to publish widely in journal articles, and to establish their own global network of collaborators. One postdoctoral fellow from Korea has participated in the program since 2008:

Sam Hyun Yoo (2015–2017), originally from the Republic of Korea, joined IIASA demographers to calculate fertility projections for Korea over the next two decades to assess the effects of delayed childbearing and a reduced number of births per woman. (PhD in sociology from Arizona State University, US)

Korea-IIASA Postdoctoral Fellowship Program

In 2016, the Korea-IIASA postdoctoral fellowship program was launched. The program is organized jointly by IIASA and the National Research Foundation of Korea (NRF). The program will support up to two Korean nationals who have received their doctoral degrees by Korean universities as postdoctoral fellows at IIASA.

Dr. Chulwook Park (2017) researched the invariant properties of biological patterns in an ecological context through Systems Dynamics with the IIASA Evolution and Ecology (EEP) Program.
Several IIASA researchers hold or have held positions at universities and other institutions in Korea. These include: Arnulf Grubler, Guest Professor of Energy Systems, Sungkyunkwan University (2009); Leena Ilmola-Sheppard, Visiting Researcher and Advisor, Science and Technology Policy Institute (STEPI), Seoul (2013); and Nebojsa Nakicenovic, Member of the International Advisory Board on Climate Change Policy Project of the Korean Government (2010–2012).

IIASA researchers regularly make presentations in Korea; a recent selection includes:

- **Nicklas Forsell** “IIASA and Forest Sectorial Modeling” at Korea University (2013).
- **Leena Ilmola-Sheppard** on “Shock Resilience in Finland, Korea and Austria” at the International Seminar on Strategic Foresight in the Science and Technology Policy Institute (STEPI) in Seoul (2013).
- **Keywan Riahi** “Energy Transition and Policy Challenges” at the 36th International Association for Energy Economics International Conference in Daegu in 2013).
- **Ulf Dieckmann** “The Overlooked Dimension of Modern Fisheries” at Pukyong National University in Busan (2012).
- **Fabian Wagner** “Energy and Climate Change Modeling” at the EWC-KEEI Workshop in Seoul (2012).
- **Wolfgang Lutz** “Options for Representing Demographic and Economic Assumptions to Span the Range of Future Developments over the 21st Century” at a meeting of the Intergovernmental Panel on Climate Change in Changwon City (2011).
- **Pavel Kabat** “The Role of Science and Technology in Tackling Global Water Challenges” at the 7th World Water Forum in Daegu & Gyeongbuk (2015).
- **Florian Kraxner** “Building bridges through Policy and Science of Climate Change Adaptation and Ecosystem Services” at the International Seminar at Korea University in Seoul (2014).

Other examples of scientific exchange include:

- 85 publications have resulted from collaborations between IIASA and Korean nationals since 2010.
- Since 2010, 15 doctoral students from Korea have participated in IIASA’s Young Scientists Summer Program and its Southern African version.
- Researchers, advisors, and diplomats from Korea have visited IIASA or attended IIASA events over 205 times since 2010, while IIASA scientists have visited Korea over 145 times.

Appendices:

Summaries detailing the presented information can be requested by contacting the External Relations Department (externalrelations@iiasa.ac.at).
Prospects for Future IIASA–Korea Activities

This Info Sheet summarizes recent research collaborations between IIASA and Korea (see Recent Research Collaborations, page 5). Significant potential remains to further intensify IIASA interactions with Korea through developing a range of new joint activities, including:

- **Enhancing Korean expertise in applying system analysis to national problems**
  Developing bespoke Korean versions of IIASA global models would allow researchers and policymakers to look at complex global problems and their impact on Korea in an international and integrated manner. For example, work has already begun on developing a Korean version of the IIASA GAINS model; and national versions of other IIASA models could also be developed (see IIASA’s models, tools, and data, page 7).

- **Conducting international assessments in areas of Korean strategic interest**
  Korea was a contributor to IIASA Global Energy Assessment, which brought together over 500 specialists to transform the way society thinks about, uses, and delivers energy. At the request of its member countries, IIASA is currently embarking on three new assessments, whose focus will be on issues of strategic interest also to Korea: holistic, integrative assessments of plausible futures for the Arctic, global water challenges, and tropical forests. In addition, IIASA is exploring the development of a quantitative foresight capability for Asia to explore future resource security (energy, food, and water) for nations in the region.

- **New partnerships between IIASA and Korean institutions to win grants from international research funders**
  IIASA high-quality research and international research network makes it highly competitive in its applications for international research funds. Between 2012 and 2017, this additional funding reached €52 million. This was part of a total funding portfolio of €265 million, the total awarded to external projects featuring collaboration between IIASA and member countries.

- **Using international scientific cooperation to support diplomacy**
  IIASA was established in 1972 to use scientific cooperation to build bridges across the Cold War divide and research growing global problems on a truly international scale. Today the soft power of science diplomacy continues to help IIASA member countries through using scientific cooperation to improve international relations, and through international teams jointly researching controversial issues to find consensus, free from the constraints of national self-interest (see Research to support science diplomacy, page 5). Recently, IIASA has launched a new global project to evaluate issues arising at the nexus of food, water, energy and climate change.

- **Academic training opportunities for early-career Korean scientists**
  There is significant potential to enhance participation by young Korean researchers in IIASA programs to develop international and interdisciplinary research skills (see page 9: Capacity Building).
About IIASA

Founded in 1972, the International Institute for Applied Systems Analysis (IIASA) conducts policy-oriented research into problems of a global nature that are too large or too complex to be solved by a single country or academic discipline. IIASA research is across and at the intersection of natural, human, social, knowledge and technology systems to support the development of integrated solutions to global sustainability challenges.

IIASA is at the center of a global research network of around 3,500 scholars and over 830 partner institutions in over 65 countries. It is funded and supported by its National Member Organizations which represent the scholarly community in the following countries:

Austria, Brazil, China, Egypt, Finland, Germany, India (Observer), Indonesia, Iran, Israel, Japan, Malaysia, Mexico, Norway, Republic of Korea, Russia, South Africa, Sweden, Ukraine, United Kingdom, United States of America, Vietnam.

Contact

IIASA, Schlossplatz 1, A-2361 Laxenburg, Austria

Phone: +43 2236 807 0
Fax: +43 2236 71313
E-mail: info@iiasa.ac.at
Web: www.iiasa.ac.at

twitter.com/iiasavienna
facebook.com/iiasa
blog.iiasa.ac.at
linkedin.com/company/iiasa-vienna
youtube.com/iiasalive
flickr.com/photos/iiasa