iiasa info sheet

Activities with Member Countries

Indonesia

Indonesia officially became a member of IIASA in 2012 through the Indonesian National Committee for IIASA. Since joining IIASA, Indonesian researchers have started collaborating with IIASA researchers on projects focused on sustainable land management, the changing energy landscape, increasing Indonesia's resilience to natural disasters, and improving air quality. Beyond continuing these new research collaborations, there is significant opportunity to grow the relationship between IIASA and Indonesia's scholarly community.

Opportunities for additional collaborations including developing bespoke Indonesian version of IIASA global models, conducting international assessments in areas of Indonesian strategic interests, partnering with Indonesian institutions to win international research grants, and contributing to Indonesian science diplomacy. Moreover, IIASA hosted a session on applied systems analysis as part of the ninth ASEAN Science and Technology Week in Indonesia in 2014.

Future collaborations could prioritize additional capacity building programs through greater scientific exchange via researching at or visiting IIASA or taking part in IIASA program for young scientists. This IIASA Info Sheet provides a summary of this expanding relationship since 2012.

Highlights of Interactions Between IIASA and Indonesia (since 2012)	
IIASA National Member Organization (NMO)	Indonesian National Committee for IIASA
Membership start date	2012
Selected research partners	■ Bogor Agricultural University ■ Center for International Forestry Research (CIFOR) ■ Republic of Indonesia Ministry of Energy and Mineral Resources ■ School of Business and Management, Bandung Institute of Technology (SBM ITB) ■ University of Indonesia, Research Center for Climate Change (RCCC) ■ World Resources Institute Indonesia ■ World Wildlife Fund Indonesia
Areas of research collaboration	■ Tropical Futures Initiative ■ Changing Energy Landscape ■ Increasing Resilience to Natural Disasters ■ Understanding and Improving Air Quality ■ Projecting Demographics in Indonesia
Capacity building	4 doctoral students from Indonesia have participated in IIASA Young Scientists Summer Programs since 2008
Publication output	15 publications have resulted from collaborations between IIASA and researchers at Indonesian institutions since 2008
Other interactions	■ 48 Indonesians have participated in IIASA events since 2008 ■ 12 researchers, advisors, and diplomats from Indonesia have visited IIASA since 2008, while IIASA scientists have visited Indonesia 53 times

Activities with Member Countries: Indonesia

IIASA Info Sheet 2016/7
October 2016

The electronic version of this document is available at
www.iiasa.ac.at/indonesia

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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's recent relationship with Indonesia. 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 Kim Montgomery.

IIASA National Member Organization in Indonesia

The Indonesian National Committee for IIASA (INCASA) is the National Member Organization representing Indonesian membership of IIASA.

Dr. Kuntoro Mangkusubroto, Professor of Decision Sciences, School of Business and Management, Institut Teknologi Bandung, is the Council Member for Indonesia.

The NMO Secretary is **Dr. Yos Sunitiyoso**, Director of Jakarta Campus, School of Business and Management, Institut Teknologi Bandung TK Low Center for Executive Education.

The Indonesian National Committee for IIASA represents Indonesia and its scholarly community on IIASA's governing Council

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Research Partners in Indonesia

IIASA works with research funders, academic institutions, policymakers, and individual researchers in Indonesia. The following list includes the names of the organizations or the individual's affiliated institutions that have all recently collaborated with IIASA.

- Bogor Agricultural University
- Bandung Institute of Technology
- Burung Indonesia
- Center for International Forestry Research (CIFOR)
- Forest Research and Development Agency (FORDA)
- Indonesia Management Agency for Reducing Emissions from Deforestation and Forest Degradatiaon (REDD+)
- Indonesian Institute of Sciences (LIPI)
- Indonesia Palm Oil Pledge (IPOP)
- School of Business and Management, Bandung Institute of Technology (SBM ITB)
- Syiah Kuala University
- Badan Rehabilitasi dan Rekonstrucksi
- Republic of Indonesia Ministry of Energy and Mineral Resources Republic of Indonesia Ministry of Research, Technology, and Higher Education
- University of Indonesia, Research Center for Climate Change (RCCC)
- World Agroforestry Centre (ICRAF)
- World Resources Institute Indonesia
- World Wildlife Fund (WWF)-Indonesia

IIASA is continually developing collaborations with Indonesia and has recently been working with 17 organizations in Indonesia via formal and informal connections

Some leading Indonesian personalities from government and academia who are associated with IIASA (recent and past)

Dr. Kuntoro Mangkusubroto, Professor of Decision Sciences, School of Business and Management, Institut Teknologi Bandung, former Head of President's Delivery Unit for Development Monitoring and Oversight (UKP4) in the 2nd United Indonesia Cabinet 2010-2014.

Mr. Sudirman Said, former Minister of Energy and Mineral Resources, Indonesia.

Professor Dr. Ir. H. Gusti Muhammad Hatta, former Minister for Research and Technology, Indonesia.

Professor Utomo Sarjono Putro, School of Business and Management, Institut Teknologi Bandung.

Dr. Idwan Suhardi, former Advisor to the Minister for Research and Technology, Indonesia.

Professor Dr. I. Gusti Agung Wesaka Puja, Permanent Representative of the Republic of Indonesia to the Organisation for the Prohibition of Chemical Weapons (OPCW), former Director General for ASEAN Cooperation, Ministry of Foreign Affairs, Indonesia.

Recent Research Collaborations

Tropical Futures Initiative

Indonesian-IIASA researchers are studying ways to achieve sustainable agriculture and land management strategies that reduce deforestation

Indonesia is an archipelagic country with over 17,000 islands, of which about 6,000 islands are inhabited. Forests cover almost 60% of the country and Indonesia has the third largest area of rainforests. Indonesia has faced significant issues with deforestation from agricultural and forestry operations, mining, and changes in infrastructure and deforestation has resulted in the loss of over 15 million hectares of forest land.

Tropical forests have been globally recognized as a significant sink and source for greenhouse gas emissions, with the implementation of initiatives such as Reduced Emissions from Deforestation and Forest Degradation (REDD) and REDD+. For Indonesia, around ninety percent of Indonesia's greenhouse gas emissions, which are the third highest behind China and the US, are generated from land-use change, particularly deforestation.

Moreover, tropical forests exist in countries and regions that face intensive development pressures, leading to a need for transformation options that both reserve natural assets and create development pathways and that reflect both the complete value of ecosystem services and the complex social structures of the localities.

The Tropical Futures Initiative is a multiyear project developed and coordinated by IIASA to focus on tropical deforestation, greenhouse gas emissions, air pollution, agriculture, and water. The first step of the initiative is to carry out a consistent quantitative global, regional, and national REDD+ assessment for Indonesia. As part of this assessment, researchers will assess policy options, mitigation potential, investment costs in forestry and agriculture, linkages to carbon markets, and synergies, as well as trade-offs with other environmental policies and the bio-economy in general.

The project will use GLOBIOM and the Global Forestry Model, G4M, as a basis for developing tailored national and regional models that help to identify REDD+ and other development policies that are economically efficient, socially fair, safeguard and enhance ecosystem values, and help meet the goals of the Convention on Biological Diversity.

Other recent Indonesian-IIASA collaborations in the area of sustainable land management include:

- Researchers from IIASA and CIFOR have used IIASA Global Biosphere Management Model (GLOBIOM) to develop improved methods of including land use, land use change, and forestry activities in assessing greenhouse gas mitigation efforts. Additionally, these methods will help provide guidance for accounting for avoided deforestation in global climate change agreements.
- IIASA researchers are working with ICARF, WRI Indonesia, and WWF Indonesia to construct enhanced datasets of degraded and marginal lands. These datasets could be used by policymakers to evaluate different scenarios of land restoration or utilization that could reduce deforestation and positively impact mitigation of greenhouse gas emissions.

Selected presentations in Indonesia

Ping Yowargana on "Techno-economic Modeling for Energy Decision Support System" at the Scientific Collaboration and Capacity Building: Decision Support Systems to Deliver Long Term Energy Vision in Bandung in 2015.

Nebojsa Nakicenovic on "Technological Transformations and Development" at the Academia Stakeholders Consultation Day, Bail in 2013.

Anthony Patt on "The Human Element of Hazard Early Warning Systems" at the Institute for Aceh and Indian Ocean Studies at Banda Aceh in 2013.

Florian Kraxner on "A Geographically Explicit Analysis of the BECCS Potential in Indonesia" at the workshop on 'Enhancing Carbon Emission Reduction through Bioenergy and Carbon Capture and Storage' in Jakarta in 2013.

Pavel Kabat delivered a keynote presentation at the 2nd International Workshop on Systems Analysis and Modeling for Policy Development in Jakarta in 2012.

Michael Obersteiner on "Trade-offs Between Food, Fuel and Fibre" at the National Science Conference in Jakarta in 2011.

Selected publications resulting from Indonesian-IIASA collaborations

IIASA research is underpinned by high-quality science, which is regularly published in high impact publications. A selection of current publications is presented here and a full list can be found in appendix 5.

- Leduc S, Patrizio P, Yowargana P, Kraxner F (2016). An optimal renewable energy mix for Indonesia In: European Geosciences Union (EGU) General Assembly 2016, 17–22 April 2016, Vienna, Austria.
- Pirker J, Mosnier A, Kraxner F, Havlík P, Obersteiner M (2016). What are the limits to oil palm expansion? *Global Environmental Change*, 73-81.
- Roelfsema M, Elzen M, Höhne N, Hof AF, Braun N, Fekete H, Böttcher H, Brandsma R, Larkin J (2014). Are major economies on track to achieve their pledges for 2020? An assessment of domestic climate and energy policies. *Energy Policy*, 67, 781-796.
- Kidd R, McCallum I, Fritz S, Kraxner F, Obersteiner M (2009). GEO Information for disaster recovery – Case Study: The use of orthophotos in Aceh, Indonesia. *IIASA Interim Report*, IIASA, Laxenburg, Austria, IR-09-011.
- McCallum I, Kidd R, Fritz S, Kraxner F, Obersteiner M (2008). Banda Aceh-The value of earth observation data in disaster recovery and reconstruction: A case study. *IIASA Interim Report*, IIASA, Laxenburg, Austria, IR-08-048.

- IIASA researchers are collaborating with WRI Indonesia, Burung Indonesia, and Indonesia Palm Oil Pledge on a demonstration case on tropical forest monitoring in Indonesia using Earth Observation data and Citizen Science. This collaboration will test and validate satellite-based observations of land use/cover changes.
- IIASA researchers assessed the area of suitable land for sustainable palm oil and investigated the limits of future oil palm expansions. The researchers found that Indonesia might face land scarcity for sustainable palm oil production. This research was published in *Global Environmental Change* in 2016.

Changing Energy Landscape

Indonesian-IIASA researchers are exploring global energy systems and how to transition to a sustainable, diverse energy mix

Indonesia is a main producer of oil, coal, and gas. Indonesia is the 5th largest coal producer and it exports 80% of its coal produced. Additionally, Indonesia is thought to possess the world's largest geothermal resources, but does not presently have the capacity for complete exploration.

Indonesia's domestic energy consumption has doubled over the last two decades and the Indonesian Ministry of Energy and Mineral Resources estimates that if the Indonesian economy continues to grow at its current rate, the domestic demand for energy will rise by around 7% per year and electricity demand alone will nearly triple between 2010 and 2030. However, at the same time, oil and gas production are declining.

The Indonesian Government's National Energy Policy emphasizes diversity in energy sources; maximum uses of domestic energy sources; and sets a target energy mix that includes over 20% of energy from new and renewable energy sources. Furthermore, the Indonesian government has prioritized geothermal in its energy expansion plans.

IIASA has substantial expertise in understanding global energy systems and their connections with economic, environmental, and societal systems.

Recent Indonesian-IIASA collaborations in this area include:

- IIASA researchers developed a spatially explicit energy system optimization for renewable energy. The research included recommendations on optimized regional energy mix with landscape consideration from excluding conversation areas. Results were presented in the "Sustainable Energy One Map" platform of the Ministries of Energy and Mineral Resources, WRI Indonesia.

IIASA models, tools, and data

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:

- IIASA researchers developed a specially tailored energy policy transparency and decision analysis tool, the Sustainable Energy One Map, for Indonesia. This tool consolidates data coming from various sources to allow policymakers in Indonesia to examine the costs, benefits, and trade-offs of various energy policy choices, with a particular focus on renewable energy.
- Global food demand could increase by more than 59% by the year 2050, according to an unprecedented comparison of 10 agricultural economic models by researchers from ABARES, IIASA and 8 other countries. The study found that demand is likely to increase by 59-98% between 2005 and 2050, more than the 54% projected by the UN Food and Agricultural Organization's most recent analysis. The study compared food demand projections for 2050, based on different population and wealth projections, as well as for different regions and products. It found that uncertainties related to population, income, and consumption, often factors which are set as assumptions in agricultural models, are even greater than uncertainties related to climate change. For example, when considering a world with higher population and lower economic growth (SSP3), consumption per capita drops on average by 9% for crops and 18% for livestock. The maximum effect of climate change on calorie availability is -6% at the global level. (Source: Valin H, Sands RD, van der Mensbrugghe D, Nelson GC, Ahammad H, Blanc E, Bodirsky B, Fujimori S, Hasegawa T, Havlik P, Heyhoe E, Kyle P et al. (2014) The future of food demand: Understanding differences in global economic models, *Agricultural Economics*, 45(1):51-67).

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

- Planning sustainable energy systems (MESSAGE model, Global Energy Assessment Scenario Database).
- Improving food security through identifying yield gaps (GAEZ model), assessing competition for land use between agriculture, bioenergy, and forestry (GLOBIOM model), and looking at social, economic, and environmental earth systems (FeliX).
- Financial disaster risk management (CATSIM model).
- Projecting future population (Demographic multistate modeling).
- Reducing energy poverty (Energy Access Interactive Tool [ENACT]).

- Indonesian researchers are participating in the Deep Decarbonization Pathways Project —a global collaboration of energy researchers working on practical pathways for countries to reduce greenhouse gas emissions and transition to a low carbon future consistent with maintaining global warming below 2°C.
- IIASA researchers are using the energy systems optimization model BeWhere, which identifies the optimal location of energy conversion sites based on the minimization of the costs of the supply chain. With the use of the model, an optimally adapted renewable energy mix can be identified. This research will help Indonesian policymakers decide where, how and which technologies should be implemented and what kind of policy support would be needed to meet the Indonesian renewable energy target.
- IIASA energy experts presented energy models and assessments tools at the "IIASA and Ministry of Energy and Mineral Resources of Indonesia Screening Workshop" held in Bandung, Indonesia. This workshop helped the Indonesian Ministry of Energy and Mineral Resources start building a decision support system capacity based on IIASA modelling tools.

- An international research collaboration analyzed whether national climate and energy policies are sufficient for meeting the emission reduction proposals that countries have made for 2020. Indonesia submitted an unconditional pledge to reduce emissions by 26% as well as an earlier conditional pledge of 41%. The researchers found that the situation is unclear for Indonesia because uncertainty in emissions from land use, land-use change and forestry make it challenging to assess whether Indonesia's policies are sufficient to meet their emission reduction proposal. This study was published in *Energy Policy* in 2014.
- A collaborative project explored opportunities of bioenergy in combination with Carbon Capture and Storage (BECCS) with experts from IIASA and Indonesia's President's Deliver Unit for Development Monitoring and Oversight (UKP4), the Global Climate Project, the International Energy Agency (IEA), and the Center for International Forestry Research (CIFOR). Since 2011, a series of six BECCS expert meetings have been organized by IIASA, IEA, and the Indonesian government at IIASA, in Jakarta, and in Sao Paulo, as well as a REDD-PAC side event at the UNFCCC COP 18 in Doha. An initial case study focuses on Indonesian forests.

Increasing Resilience to Natural Disasters

Indonesia has the most active volcanoes in the world. Along with volcanic eruptions, Indonesia faces significant risks of earthquakes, floods, and tsunamis. In the past few decades, Indonesia has experienced devastating natural disasters that have been responsible for the loss of hundreds of thousands of lives and cost Indonesia US$1.5 billion.

Joint Indonesian-IIASA studies found that earth observation data had significant benefits to the relief efforts after the 2004 Tsunami at Banda Aceh

IIASA risk experts analyze how to increase resilience against a range of hazards. Recent Indonesian-IIASA collaborations in this area include:

IIASA global contribution

Many of today's most pressing challenges do not stop at 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 National Member Organizations recognize this need and that their investment in IIASA is a contribution to a global public good. And 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 IPCC (Intergovernmental Panel on Climate Change) 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.

- Following the devastating impact of the 2004 Tsunami on Banda Aceh in Indonesia, IIASA risk experts worked with the Spatial Information and Mapping Centre of the Badan Rehabilitasi dan Rekonstrucksi and the Nanggroe Aceh Darussalam and the Remote Sensing and Geographic Information System Centre in Syiah Kuala University to analyze and quantify the value that earth observation data brought to the relief/reconstruction effort. The researchers found significant benefits from in-situ, airborne, and space observations, in terms of cost and time savings in identifying priorities for relief and reconstruction in the days and weeks after a disaster. Specifically, they found that the data set was worth over 16 times its actual cost and provided support to project worth over 600 times its actual cost. However, achieving that value can be limited by lack of training, data gaps and uneven quality.
- IIASA and Badan Rehabilitasi dan Rekonstruksi researchers interviewed several agencies operating in the Banda Aceh on the use, sources, and quality of earth observation data in the relief/reconstruction effort. The researchers found that there was a need for more training for local staff to effectively use the data and that new and updated information was needed in a timely fashion after a disaster.

Understanding and Improving Air Quality

IIASA-developed models could help identify the most efficient and effective measures to tackle Indonesia's air pollution

Indonesia faces significant air pollution that has serious public health consequences. A study in Jakarta found that more than 50% of illnesses suffered by residents were related to air pollution. Recent economic growth has worsened the air quality in Indonesia, with vehicles being a major source of air pollution. The Indonesian government is working to address air pollution by phasing out leaded gasoline, improving emission standards, and constructing mass transit.

IIASA has substantial expertise in understanding air pollution and has developed scientific tools to help policymakers make informed decisions that will improve air quality. The IIASA Greenhouse Gas-Air Pollution Interactions and Synergies (GAINS) model enables searches for sets of measures that simultaneously meet environmental targets on air quality and greenhouse gas reductions at least costs. An analysis using GAINS to project the emissions of major air pollutants to 2035 for 25 regions, including Indonesia, demonstrates the synergies between climate change and air pollution control policies. The results were published in the International Energy Agency's World Energy Outlook 2011.

Through the Toyota Clean Air Project, IIASA works toward systematic improvement of GAINS ozone and particulate matter emissions inventories in collaboration with scientists from five Asian nations, including the University of Indonesia (UI) Research Center for Climate Change. To support those efforts, in October 2013, IIASA hosted two scientists from the University of Indonesia (UI) for a one-week GAINS model training session.

Research to support science 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. For example, researchers and policymakers from Austria (Vienna Institute for International Economic Studies), the European Commission, Finland, Germany, Russia, and Ukraine are jointly analyzing the challenges and opportunities for greater economic integration in 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 recently negotiated membership with Iran and is negotiating membership with Israel.

Projecting Demographics in Indonesia

IIASA demographers are providing independent projections of the future Indonesian population including population drivers such as education

In 2012, Indonesia had almost 250 million people. Indonesia is the fourth most populous country in the world with a large and diverse population. At the current rate of population growth, Indonesia's population will exceed the United States by 2045 and will become the world's third most populous country.

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, the IPCC in 2011 adopted IIASA population projections as its source data in all modeling for the 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 in the Oxford University Press volume *World Population and Human Capital in the Twenty-First Century.* Findings for Indonesia show how different policies over the next few decades could lead to the country's 2012 population of 245 million reaching almost 365 million by 2060 depending on which policies are adopted. Additionally, in 2016, *Who Survives? Education decides the future of humanity*, a book summarizing scientific research conducted at IIASA was published detailing the importance of education for societal and economic development. The researchers found that education is often more important than income when looking at health, resilience, and wellbeing.

Capacity Building

Young Scientists Summer Programs

Since 2012, four young Indonesian researchers have developed research skills and networks by taking part in the IIASA 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. Funding is provided through IIASA National Member Organizations. The YSSP has attracted over 1,800 participants from over 80 countries since it was established in 1977.

In 2012 IIASA launched its first regional YSSP called the Southern African Young Scientists Summer Program (SA-YSSP) aimed primarily at PhD students based in the southern hemisphere. The program was organized jointly by the South African National Research Foundation, the South African Department of Science and Technology, the University of the Free State in Bloemfontein, South Africa, and IIASA.

Since 2008, the following four Indonesiean students have participated in these programs (Funded by the Indonesian NMO):

Corinthias Sianipar (YSSP '16 & Institut Teknologi Bandung) investigated system modeling of appropriate technology integration into the cocoa industry at Aceh, Indonesia.

Dian Andriana (YSSP '15 & Institut Teknologi Bandung), used Artificial Neural Networks (ANNs) to analyze uncertainty in global warming models.

Apolonia Diana Sherly da Costa (YSSP '14 & Community Association for Disaster Management) analyzed community resilience due to river flooding in Belu Regency, East Nusa Tenggara Province, Indonesia.

Dhanan Sarwo Utomo (SA-YSSP 12/13 & School of Business and Management, Institut Teknologi Bandung, Indonesia), analyzed optimal policies toward the biodiesel industry in Indonesia.

Scientific exchange through people

- 48 Indonesians have participated in IIASA events since 2008.
- 15 publications have resulted from collaborations between IIASA and researchers at Indonesian institutions since 2008.
- 17 Indonesians have been employed by IIASA since 2008.
- 12 researchers, advisors, and diplomats from Indonesia have visited IIASA since 2008, while IIASA scientists have visited Indonesia 53 times.

Appendices:

The details behind the above facts can be found in the following appendices to the country sheet. The appendices are either attached or available on request from Tom Danaher (danaher@iiasa.ac.at):

1. Employees from Indonesia at IIASA (2008-2016)
2. Visitors from Indonesia to IIASA (2008-2016)
3. Conference participants from Indonesia (2008-2016)
4. Travel by IIASA scientists to Indonesia (2008-2016)
5. Publications relevant to Indonesia-IIASA collaborations (2008-2016)

Prospects for Future Indonesian-IIASA Activities

Enhancing the Indonesian-IIASA relationship offers benefits for Indonesian research, government policy, and international relations

This Info Sheet summarizes recent research collaborations between IIASA and Indonesia. Since Indonesia recently joined IIASA, there is significant opportunities for strengthening the IIASA-Indonesian relationship through developing a range of new joint activities including:

- **Enhancing Indonesian expertise in applying system analysis to national problems** Developing bespoke Indonesian versions of IIASA global models would allow researchers and policymakers to look at complex global problems and their impact on Indonesia in a holistic and integrated way. For example, the Dutch government worked with IIASA to develop a Dutch version of the IIASA GAINS model. The new model helps ministries to identify cost-effective measures to improve air quality and reduce greenhouse gas emissions in the Netherlands at the same time as complying with the country's obligations under European air quality agreements.
- **Conducting international assessments in areas of Indonesian strategic interest** In 2012 IIASA completed the Global Energy Assessment which brought together over 500 specialists to transform the way society thinks about, uses, and delivers energy. IIASA has proposed several new assessments, at the request of its member countries that will focus on issues of strategic interest to Indonesia.
- **New partnerships between IIASA and Indonesian 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 2010 and 2015 this additional funding reached €51 million. This is part of a funding portfolio of €250 million, the total awarded to external projects featuring collaborations between IIASA and its 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 8). IIASA recently launched a new global project to evaluate issues arising at the nexus of food, water, energy, and climate change.
- **Academic training opportunities for young Indonesian scientists** There is significant potential to enhance participation by young Indonesian researchers in IIASA programs to develop international and interdisciplinary research skills (see page 10: 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's 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 2,500 scholars and almost 600 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:

Australia, Austria, Brazil, China, Egypt, Finland, Germany, India, Indonesia, Iran, Malaysia, Japan, Netherlands, Norway, Pakistan, Republic of Korea, Russia, South Africa, Sweden, Ukraine, United Kingdom, United States of America, Vietnam.

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