

7th International Forum on Sustainable Future in Asia /
7th NIES International Forum

Research for Societal Transformation with Future Earth

Report

Held on Jan. 20-21, 2022, Online

Organizer

National Institute for Environmental Studies

Special Co-organizers

Research Institute for Humanity and Nature
Nagasaki University

Co-organizers

Institute for Future Initiatives, The University of Tokyo
Regional Resource Centre for Asia and the Pacific, Asian Institute of Technology

Supporter

Future Earth Global Secretariat Hub Japan



National
Institute for
Environmental
Studies, Japan

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東京大学未来ビジョン研究センター
Institute for Future Initiatives



RRC.AP
Regional Resource Centre for
Asia and the Pacific

Program

MC Giles Bruno Sioen NIES/ Future Earth Global Secretariat Hub Japan

Day1 January 20, 2022 Open Symposium

13:30~13:50 Welcome Addresses

Masahide Kimoto

National Institute for Environmental Studies, Japan

Shigeru Kohno

Nagasaki University, Japan

Juichi Yamagiwa

Research Institute for Humanity and Nature, Japan

Kensuke Fukushi

Institute for Future Initiatives, The University of Tokyo, Japan

Naoya Tsukamoto

Regional Resource Centre for Asia and the Pacific, Asian Institute of Technology, Thailand

13:50~14:00 Introduction from Moderator

Fumiko Kasuga

National Institute for Environmental Studies / Future Earth, Global Secretariat Hub Director - Japan

14:00~15:00 Keynote Speeches

Michiru Nishida

Nagasaki University, Japan

Leena Srivastava

International Institute for Applied Systems Analysis, Austria

Ilan Chabay

Institute for Advanced Sustainability Studies, Germany

15:15~16:30 Flash talks from young researchers

Mutual understanding with the society and science

Facilitator**Kazuhiko Moji**

Nagasaki University, Japan

Speakers**Charissa Ferrera**

Marine Science Institute, University of the Philippines, Philippines

Asmawati Muhamad

Academy of Islamic Studies, University of Malaya, Malaysia

Balt Suvdantsetseg

Mongolian Academy of Sciences, Mongolia

Novelia Triana

Nagasaki University, Japan

Huynh Thi Mai Lam

The University of Tokyo, Japan

Ekawati Desy

Bogor Agricultural University, Indonesia

Tan Duc Nguyen

Nagasaki University, Japan

Shinichiro Asayama

National Institute for Environmental Studies, Japan

Hiroki Hashizume

Nagasaki University, Japan

Obey Gotore

Nagasaki University, Japan

Bonjun Koo

Research Institute for Humanity and Nature, Japan

16:30~17:15 Panel Discussion

Society & Science

Facilitator**Seita Emori**

National Institute for Environmental Studies, Japan

Panelists**Michiru Nishida**

Nagasaki University, Japan

Leena Srivastava

International Institute for Applied Systems Analysis, Austria

Akimasa Sumi

The University of Tokyo, Japan

Shobhakar Dhakal

Asian Institute of Technology, Thailand

Yasuko Kameyama

National Institute for Environmental Studies, Japan

17:20~17:25 Summary of the Day1

Fumiko Kasuga

National Institute for Environmental Studies / Future Earth, Global Secretariat Hub Director - Japan

17:25~17:30 Closing Remarks of Open Symposium

Takeshi Nagayasu

Nagasaki University, Japan

Day2 January 21, 2022 Expert Sessions

13:30~13:35 Welcome Greetings

Hein Mallee

Research Institute for Humanity and Nature, Japan

13:35~14:50 Expert Session 1

Valuing Environment

Chairperson**Chris Fook Sheng Ng**

The University of Tokyo, Japan

Speakers**Arif Satria**

Bogor Agricultural University, Indonesia

Takahiro Ota

Nagasaki University, Japan

Kiyoshi Takahashi

National Institute for Environmental Studies, Japan

Alan Dangour

Wellcome Trust, London, UK

15:00~16:15 Expert Session 2

Net zero GHG emissions by 2050 in a complex world with stakeholders

Chairperson**Yasuko Kameyama**

National Institute for Environmental Studies, Japan

Speakers**Jiang Kejun**

Energy Research Institute, China

Tatsuya Hanaoka

National Institute for Environmental Studies, Japan

Rizaldi Boer

Bogor Agricultural University, Indonesia

Tomoko Shirai

National Institute for Environmental Studies, Japan

16:25~17:40 Expert Session 3

Systemic Risks

Chairperson**Hein Mallee**

Research Institute for Humanity and Nature, Japan

Speakers**Takehito Yoshida**

Research Institute for Humanity and Nature / The University of Tokyo, Japan

Chadia Wannous

Future Earth Health Knowledge-Action Network

Junya Tani

The University of Tokyo, Japan

Maurie Cohen

New Jersey Institute of Technology, USA

17:40~17:55 Summary of the Forum

Chiho Watanebe

Nagasaki University, Japan

17:55~18:00 Closing Address

Yuichi Moriguchi

National Institute for Environmental Studies, Japan



Report

of

7th International Forum on Sustainable Future in Asia /

7th NIES International Forum

- Research for Societal Transformation with Future Earth -

March 3, 2022

Please refer to the Abstract of each presentation in the Abstract Book
<https://www.nies.go.jp/i-forum/>

Report

Summary of Day1 Open Symposium

Dr. Giles Bruno Sioen, Science Officer at Future Earth and Research Associate at the National Institute for Environmental Studies opened the Forum as a Master of Ceremony.

Welcome Address

Representatives from each of five co-organizing institutions congratulated the 7th NIES International Forum and welcomed the speakers and participants.

Dr. Masahide Kimoto, President, National Institute for Environmental Studies, Japan, Prof. Shigeru Kohno, President, Nagasaki University, Japan, Prof. Kensuke Fukushi, Vice Director, Institute for Future Initiatives, The University of Tokyo, Japan, Dr. Naoya Tsukamoto, Director, Regional Resource Centre for Asia and the Pacific, Asian Institute of Technology, Thailand and Prof. Juichi Yamagiwa, Director-General, Research Institute for Humanity and Nature, Japan emphasized the importance of stakeholder engagement and mentioned that Science and Scientist are part of Society and “people”.

Introduction from Moderator

Dr. Fumiko Kasuga, Global Hub Director - Japan, Future Earth and Senior Fellow, National Institute for Environmental Studies outlined the forum structure and the background need for collaboration, dialogue and efforts to understand across disciplines, sectors and generations.

Keynote Speeches

Dr. Michiru Nishida, Professor, Research Center for Nuclear Weapons Abolition (RECNA), Nagasaki University, Japan:

Title: Need for Reframing Nuclear Weapons as an Environmental Issue to Realize the Regional and Global Sustainability

- a It is important to recognize the issue of nuclear weapons as an environmental issue.
- b The impact of the use of nuclear weapons spreads worldwide through the confusion in the supply chain or causing nuclear winter.
- c Scenarios of atomic bomb attacks were presented, and an enormous scale of potential deaths

was demonstrated.

- d In Asia, the risk of the use of nuclear weapons is higher than in any other region of the world.
- e Nuclear weapons (conventionally international politics and security context) should not be underestimated but be recognized as an environmental issue.
- f Nuclear use should be reframed as a climate problem and it would be helpful if discussed together with environmental scientists, also to attract more attention.

Dr. Leena Srivastava, Deputy Director General for Science, International Institute for Applied Systems Analysis (IIASA), Austria

Title: Valuing Our Environment: Driving Decisions Today for A Sustainable Tomorrow

- a Need to address both Planetary Boundaries and governance of the society
- b To frame valuing environment, we need to consider both “use value” and “non (discovered) use value”, and internalization of value of environment.
- c Research trends were also shown, including methods, e.g., willingness to pay, choice experiment, and their levels, constraints and challenges.
- d Societal transformation would be triggered by both government actions and individual choices.

Prof. Ilan Chabay, Head of Strategic Research Initiatives and Programmes, Institute for Advanced Sustainability Studies Potsdam (IASS), Germany

Title: Systemic Risks, Social-Environmental Change, and Global Crises

- a Complex social environmental system contains
 - multiple interactive components
 - feedback loops connecting interdependent components, - amplify (positive) or damping (negative) and non-linear feedback
- b Resilient recovery is basic functionality of the society
 - shock-resilience flows: repetition of shock, resilience and sustainability
 - social capacity to change allows transition to more sustainable future.
- c Crisis is led by
 - lack of knowledge
 - insufficient investment
 - discounting scales – temporal and spatial
 - lack of governance
 - factors to failure (learning wrong lessons from the past, endogenous risks and not recognizing approaching social tipping points)
- d How can we avoid crises or be prepared to mitigate or adapt?

- narratives as important tools for systemic risk governance
 - e.g., Polish fisheries roundtable, social identity in Alaska
- importance of “systems” – “we are a part of global systems”

Flash talks from young researchers: Mutual understanding with the society and science

Facilitator: Prof. Kazuhiko Moji, Dean, School of Global Humanities and Social Sciences, Nagasaki University

1. 10 early-career researchers from several Asian countries shared their experiences and challenges, and presented various topics,
 - a fishery, agriculture, forest management, urban planning, infectious diseases
 - b role of mosque, ecologically-literate Muslim community
 - c Future Earth national committee
 - d net zero, Bayesian approach
 - e ways of co-design and scientists’ attitude
2. Question raised: How to bridge narratives one from the past information and the other for future?
3. Continuous efforts and further scaling up of research encouraged.

Panel Discussion: Society & Science

Facilitator: Dr. Seita Emori, National Institute for Environmental Studies

1. In addition to the Keynote speakers, Drs. Nishida and Srivastava, Prof. Akimasa Sumi, Institute for Future Initiatives, The University of Tokyo, Prof. Shobhakar Dhakal, Asian Institute of Technology (AIT), Thailand, and Dr. Yasuko Kameyama, National Institute for Environmental Studies joined as Panelists.
2. Prof. Kazuhiko Moji also joined to introduce comments/questions by the Flash talk speakers.
3. Discussed by the panelists included:
 - a There are two types of interaction, with larger impacts in nature and almost equal level of impact between nature and human
 - b Real time response to disasters – monitoring needed
 - c Climate change – only developed by so many scientists in the world
 - d Continuous efforts needed for academia to provide a basis for decision making – accurate data, easy-to-access data, avoid fake information, trust to data source
 - e Scientific information needs to be customized to be usable for various types of audience

- including policy makers, and to be inclusive.
- f Uncertainty cannot be reduced by observation, measurement or belief.
- g Role of media cannot be ignored in science communication
- h Climate change is a security issue
- i Co-benefit of decarbonization is emphasized
- j Relationship between scientist and society need to change. Scientists need to behave different way in conducting and in delivering scientific findings.

Closing remarks

Prof. Takeshi Nagayasu, Trustee, Nagasaki University thanked the speakers and facilitators, and pointed out that the Nobel Prize given to Dr. Manabe was an indication of societal recognition on climate change and encouraged climate science to further contribute to the society.

Summary of Day2 Expert Sessions

Dr. Giles Bruno Sioen presided over the meeting.

Expert Session 1

Title: Valuing Environment

Session Organizer: Prof. Chieko Kondou, Nagasaki University

Session Chair: Dr. Chris Fook Sheng Ng, The University of Tokyo

Key points of each speakers:

1. Prof. Dodik Nurrohmat
 - a National plan put in place in Indonesia to ensure green growth, e.g. forest management and expansion of land for agriculture
 - b Digital Agriculture Ecosystem: use of digital technologies in agriculture to close the inter-generational gaps (traditional agriculture and technologies), and improve efficiency
2. Dr. Takahiro Ota
 - a Payment for Ecosystem Services (PES) for human animal farming activity to preserve environment and prevent the degradation of environment. Example of swallow bird

nest farming and peat swamp forest management (prevent forest fires).

3. Dr. Kiyoshi Takahashi
 - a Using the Integrated Assessment Model, particularly the Asia-Pacific Integrated Model (AIM) to examine climate policies, allowing us to take a peek into the future of the consequences of our actions.
 - b Model has been expanded in scope, allowing us to better evaluate ourselves on certain SDGS such as hunger, forest area, water, energy, etc.
 - c There can be side effects of climate policy on food security. Need inclusive climate policy design to address problems. Comprehensive consideration of various components a priority of model improvement
4. Prof. Alan Dangour
 - a Important to understand of the intricacy between our food system, our diets and food choices, our health and the environment in order to address the impact of climate change on food system.
 - b Showed an example in UK, where better adherence to recommended diets can reduce carbon footprint and less reliance on climate-change sensitive countries to produce the food.

Session Summary:

In this session, three factors were discussed by four invited speakers: food, environment, and human health. The concept of protecting the earth system for human survival is the key to "valuing the environment." Integrated Assessment Models of climate policy, developed on a wealth of scientific validation, indicated a close correlation between climate actions and hunger issues. With further population growth, the destruction of the earth system through agriculture and agricultural land development will have a significant negative impact on climate change, including deforestation, and climate change will further accelerate the worsening of food problems through extreme dryness and flooding. Current animal farming and agriculture methods are not sufficiently environmentally considerate. These should be a more sustainable production system. On the other hand, eutrophication and oligotrophication are unevenly distributed among generations and regions.

These need to be transformed into better systems through economic measures and scientific/engineering methods. In their talk, Free-living animal farming and digital, high-efficiency agriculture were proposed as the strategies of the primary sector. However, we can do things at the kitchen table, such as reducing foods with extremely high environmental impact, like beef, and adhering to necessary nutritional intake. We need to change our food choices with caution and eating habits and introduce modern but environmentally friendly farming and agricultural systems, and take steps to balance public health and the earth system.

Expert Session 2

Title: Net zero GHG emissions by 2050 in a complex world with stakeholders

Session Organizers:

Dr. Hiroshi Tanimoto, National Institute for Environmental Studies

Dr. Giles B. Sioen Science Officer at Future Earth / National Institute for Environmental Studies

Session Chair: Dr. Yasuko Kameyama, National Institute for Environmental Studies

Key points of each speakers:

1. Kejun Jiang
 - a China aiming to become Climate neutral by 2060
 - b Transition to low carbon economy thanks to technological progress
 - i. Aim to have electric vehicles cheaper than conventional in 2025
 - ii. Transition happening with trucks and airplanes
 - iii. Transition in household uses (LED lighting, efficient refrigerators,..)
 - iv. Transition in industry (steel making, Ammoniak,...)
 - Green Hydrogen based steel construction plant operational within two years
 - Steel production moving to northern part of China for better access to cheap renewable energy
 - c Positive impact on GDP growth by effective transition
2. Tatsuya Hanaoka
 - a Global Carbon-Neutrality and co-benefit-tradeoff effects on non-co2 emission projects
 - i. Scale emission gaps of Nationally Determined Contributions and Paris Agreement Climate proposals
 - ii. Co2 emissions in Asia growing, with the gap with global emissions to meet 1.5 C scenario being as big as all of Asia's emissions
 - iii. Coal phase-down important and discussed at recent COP
 - Coal combustion is also major source of black carbon, SO₂, and Mercury and thus has impacts on air pollutants as well
 - iv. Asia accounts for large proportion of air pollutants; precursor of tropospheric O₃; short-lived climate polluters
 - v. Global Anthropogenic Hg Emissions in 2015
 - Asia accounts for around 60%

- vi. Synergies and trade-offs are important
 - Direct emission reductions possible with electrification; However, in Asia a large share of electricity production comes from coal. This means that air
 - pollution and GHG emissions in Asia will remain OR increase. Carbon Capture and Storage would be necessary in addition to coal phase down towards renewable energy
 - vii. AIM allows for optimization of policy options based on scientific data
 - Largest co-benefit effects in power sector in Asia based on the need of 50% reduction in GHG globally
3. Dr. Boer Rizaldi
- a Decarbonizing Indonesian Forest and Land use towards NZE
 - i. Largest GHG emissions in Indonesia among ASEAN countries comes from Land use and forestry sectors, followed by the energy sector
 - ii. There is intention in NDC from Indonesia to decarbonize
 - iii. A long-term strategy has been developed for all sectors
 - iv. 2030 is projected to be peak emissions - after that it is intended to become a net sink
 - v. Main intent is for a massive cut in deforestation and sustainable use of land and forest by:
 - Land use efficiency optimization
 - Enhanced natural regeneration
 - Restoration of peatland and mangrove
 - Mixed farming system
 - Reduced food loss and waste
 - vi. Key policies:
 - Forest and peatland moratorium and sustainable land use management
 - Mandatory certification for sustainable forest management and oil palm
 - Multi Business Scheme
 - Social Forestry/TORA
 - Fiscal policy to support low carbon development
4. Tomoko Shirai
- a Global Carbon Budget: implications of the latest observations
 - i. Vulnerability
 - Patterns and variability
 - ii. Diagnostics
 - iii. Low Carbon

- b GCP gathers and makes data available for research and has multiple press releases important for policy
 - c Anthropogenic activities as part of the global carbon cycle explained
 - i. Atmospheric Co₂ concentration growth rate driven by Fossil fuel use and land use change
 - ii. The global budget includes natural sinks and comes to the conclusion that there is a 3% imbalance between sources and sinks
 - d Sinks have been growing alongside emissions, but predictions show that climate change is affecting sinks
 - e COVID short-term emission reductions have already been overturned in 2021 because of big emission increases
 - f To reach net zero emissions by 2050 we have to cut emissions each year quite significantly.
 - g There are some working groups in GCP about technology solutions etc. GCP is open to welcoming researchers interested in joining them for this.
5. Q&A discussion
- a Involvement of stakeholders to speed up implementation
 - i. China: conversation with business and the public
 - ii. Coal phase down: body in charge of policy making
 - iii. Capability in developing countries, including in Japan remains to be a big barrier for transition
 - iv. Indonesia: non-governmental sectors including private sector but there is difficulty in terms of incentives for them to be involved
 - v. GCP: showing data can help stakeholders to better understand the challenges. COP included stakeholders from various sectors and data led to them not be able to avoid this issue

Session Summary:

This session invited experts that discussed ambitious attempts by national governments to achieve net-zero GHG emissions in Indonesia, China, Japan, Asia, and the world. It was found that there is still an emission gap of Nationally Determined Contributions with the level of reductions needed globally being as large as all the emissions accounted for in Asia.

The speakers introduced the role of technological progress to improve energy efficiency (in industry, household appliances, transportation, etc.) and on improving land-use and forestry efficiencies (regeneration, conservation, behavioral changes, etc.); however, great care is needed as for example electrification in the transportation sector can reduce local emissions but as long as most electricity in

Asia is still produced by coal, it may lead to increases in total harmful emissions in the region. They further discussed how incremental change alone will not be sufficient and continued monitoring and information sharing for diverse stakeholders is needed. Further, they discussed how transformative decisions informed by data (Global Carbon Project and Integrated Assessment Model) and considering co-benefits, as well as trade-offs, will have greater success if they are made together with society and other key stakeholders such as from the business sector.

The experts concluded the session with an agreement that there is still a gap in capability to transform in many countries and thus continued work is needed in this area.

Expert Session 3

Title: Systemic Risks

Session Organizer: Prof. Hein Mallee, Research Institute for Humanity and Nature

Session Chair: Prof. Hein Mallee, Research Institute for Humanity and Nature

Key points of each speakers:

1. Yoshida Takehito
 - a Flooding and landslides: due to extreme weather, but also urbanization and economic growth. Climate Change context led to higher frequency in Japan.
 - b Disasters can cause cascading impacts
 - c Control measures can lead to trade-offs and systemic risks. The hard task ahead is to reduce disaster risk without in turn causing systemic risk.
 - d Nature also provides “blessings” (e.g., landslides provide stone materials) → need to find synergies
 - i. Traditional landscape management, for example diversion areas for river spillover. Or stonewalls and forests to protect against landslides.
 - ii. Working with local communities to learn from traditional systems and build consensus.
 - iii. Eco-system based approaches
2. Chadia Wannous
 - a Drivers of disease emergence. Same causes as biodiversity loss etc.
 - b Deforestation, agricultural intensification, mining, infrastructure, exploitation of species (unregulated animal trade and growth in travel).

- c Transitions:
 - i. Economic growth improves health but also has negative impacts.
 - ii. Demographic transition
 - iii. Energy transition: positive aspects, but also brought the Anthropocene
 - iv. Urbanization: 50% in cities. Opportunity to build new urban areas in different ways.
 - v. Climate change complicates all of the above. More poverty, urban heat. Increased events.
Changing ecosystems lead to different species/ vector/ pathogen dynamics.
 - d Climate change and land use change will increase zoonotic hazards. Ecosystem approach is the way to go.
 - e Build resilient health systems
3. Tani Junya
- a No real economy, no finance. Connected by feedback loop, both positive and negative.
 - b Food market. Need to price environmental burdens and financial instruments.
 - c Earth system instability damages the global economy and finance. No way to hedge against global environmental change. Need to stabilize the earth system.
 - d Financial system can change the system through financial redistribution. But also need regime shift in the real economy: carbon tax, emissions trade. And regime shifts in finance: priority on environment.
 - e Global environmental crisis is the ultimate systemic risk. Globalized market system can be the solution.
4. Maurie Cohen
- a How to comprehensively manage risk?
 - b Weak and strong sustainability: spectrum from compliance to coevolution
 - c Degrowth, post-growth, post-capitalism, foundational economy (care, health, local food, etc.), care economy, happiness economy, doughnut economics, consumption corridors, 1.5 lifestyles, next system thinking, pluriverse, social and solidarity economy, Buen Vivir
 - d System tipping point?

Session Summary:

Based on the serious concerns that systemic risks could upset the entire planetary system in the Anthropocene, this session discussed and explored three dimensions of systemic risk: disaster risk reduction, ecosystem health and pandemic risk and financial risk, in order to effectively manage and reduce future risks, by deeply exploring fundamental underlying drivers and examining the entire economic system.

Speakers indicated potential linkages between environmental events and systemic risks, such that natural disasters could trigger cascade events under vulnerable conditions, that pandemics increases poverty and inequality, and that climate change damages the global economy and finance. They commonly stated that urbanization and economic growth have been increasing disaster risk, zoonotic hazards and ecosystem loss, although they have also brought benefit to human life and health. Trade-offs should be considered in avoiding the systemic risk. However at least it is certain that global climate change is an ultimate systemic risk.

In order to comprehensively manage systemic risks, it was suggested to take eco-system based approaches, to learn from local knowledge and communities wisdom, to build resilient health systems and to bring regime shift in the real economy.

7th International Forum on Sustainable Future in Asia was organized and presented by:

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Dr. Hiroshi Tanimoto

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Special thanks to Global Environmental Forum

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