Keynote Speech 1

Dr. Böer is a professional project manager with 30 years of international experience in the global environmental sciences. He spearheaded professional activities in more than 20 countries in Africa, America, the Arab Region, Asia/Pacific and Europe, and he lived for longer periods in Ethiopia, Germany, Qatar, Saudi Arabia, Thailand, and the United Arab Emirates.

He edited and produced 20 books, 40 book-chapters, numerous publications in international journals, many films, and a large number of technical reports and major proposals, and he functions routinely as invited reviewer of science journals and major international assessments.

During 19 years with UNESCO he continuously served as Regional Program Specialist in Doha and Addis Abeba, and he is currently serving as Natural Science Chief in Bangkok.

His work focuses on addressing environmental issues and catalyzing adaptation, mitigation options and problem solving.

UNESCO Bangkok's contribution towards sustainable human living

Presenter: Benno Böer (UNESCO Bangkok Regional Bureau for Education in Asia Pacific)
Email: b.boer@unesco.org

Keywords: plastic pollution; environmental education; mangroves; scientific publications; climate change; salt-water-utilization, achieving SDGs 6, 7, 11, 12, 13, 14, 15.

Abstract:
UNESCO is the United Nations specialized agency with *Science* in its name and mandate. The full range of UNESCO's science interventions, includes ecology and earth sciences, hydrology, and science-capacity building. The UNESCO Bangkok Science Unit has a focus on a few highly important contemporary issues related to achieving the Sustainable Development Goals:

- www.theplasticinitiative.org aims to improve the catastrophic situation on global plastic pollution, initially in Asia-Pacific.

- *UNESCO Green Academies* aim at enhancing the students experience via practical and replicable action contributing to improved living conditions. The initiative touches on biodiversity, climate, water, and capacity augmentation via education for sustainable development and community outreach.

- The *Mekong Mangrove Forum* promotes the conservation, and development of and research into mangrove ecosystems in the Mekong countries and elsewhere.

- Scientific publications are essential for science-based ecosystem management, including urban and natural ecosystems, and for the science-based understanding of realities. The Bangkok Office currently produces the following publications:
  a. The World Climate ATLAS – providing facts on how the climate changes during the last 90 years, with an outlook to 2050.
  b. The water-, food, energy-security-nexus in Asia-Pacific.
  c. The *Sabkha Ecosystems of the World* (salt-water utilization, utilization of saline soils, utilization and conservation of salt-tolerant plants).

Presentation abstracts

Session 1
Initiatives in Human Survivability Studies

Do Children with High Curiosity Show More Exploratory Behaviors?

Presenter: Shoko Iwasaki (Graduate School of Advanced Integrated Studies in Human Survivability, Kyoto University)
Email: iwasaki.shoko.24x@st.kyoto-u.ac.jp

Co-researchers: Kaoru Sekiyama (Graduate School of Advanced Integrated Studies in Human Survivability, Kyoto University)
Yusuke Moriguchi (Graduate School of Education, Kyoto University)

Keywords: children, epismetic curiosity, exploratory play

Abstract:
The OECD learning framework 2030 has been set to share a new vision of learning toward the future of the uncertain world. Although this framework emphasizes curiosity as one of important skills children need to develop, less is known about how curiosity relates to positive behaviors. In addition, there are no scales to measure curiosity in young children in Japanese. Therefore, this work started to establish caregiver-report scales to measure curiosity in young children in Japan, aiming to investigate the relation between curiosity and exploratory behaviors in young children. To this end, we included two types of epistemic curiosity, i.e., diversive curiosity and specific curiosity in the scale (Berlyne, 1954). It is thought that diversive curiosity motivates to explore new knowledge widely and specific curiosity motivates to explore specific information to reduce uncomfortable feeling caused by incomplete understanding. In this paper, we report how the scales were established, and we also describe our future plan for investigating curiosity development and the relation between curiosity and exploratory behaviors. First, original curiosity scales (Piotrowski, Litman, & Valkenburg, 2014) for young children were translated from English into Japanese. Next, 137 parents with 3 to 6-year-old children completed a questionnaire containing 5 items of diversive curiosity and 5 items of specific curiosity. By using the established curiosity scales and experimental measurement of exploratory behaviors, our future steps will examine developmental changes in curiosity from 3 to 5 years of age. Specifically, the experiment will measure how long each child play with a novel/uncertain toy. Correlation analyses will be conducted between curiosity and exploratory behavior toward an uncertain toy. This study will contribute to supporting young children's curiosity fostering in the future.

International taxation under global economy -Implication from network science

Presenter: Tembo Nakamoto* (Kyoto University)
Email: nakamoto.tembo.75w@st.kyoto-u.ac.jp

Co-researcher (s): Yuichi Ikeda (Kyoto University), Abhijit Chakraborty (University of Hyogo), Odile Rouhban (Kyoto University)

Keywords: sustainable development; international taxation; network analysis

Abstract:
Sustainable Development Goals' (SDGs) goal 17 encourages governments to improve their tax systems to mobilize the domestic resources needed to meet the SDGs. Sufficient tax revenue is inevitable to provide basic services. However, developing countries face a challenge to raise the appropriate level of tax revenues. Tax revenue as a proportion of GDP, which shows the efficiency of tax systems, is only around 15.3% for Asian developing countries, while that is around 34.2% for the OECD countries. This is partly because developing countries are suffering from international tax avoidance.

The research was undertaken to seek how international tax avoidance is effectively prevented. Among various international tax avoidance schemes, the research put its focus on treaty shopping, which is the technique to obtain treaty benefits improperly and avoid withholding tax, because developing countries are more concerned about it. We analyze the withholding tax rate determined by tax law and tax treaty of each jurisdiction and ownership relations among worldwide firms from the viewpoint of network science. Network science captures an object as a network composing of nodes and links to understand its characteristics. We captured the withholding tax rates as a network that represents international taxation and captured the ownership relations as a network that represents cross-border capital flows. Consequently, the research shows two interesting points in terms of the prevention of treaty shopping. First, a small number of jurisdictions and industries are likely to be used for treaty shopping. It can be presumed that it is not necessary to revise all tax laws and tax treaties for the prevention of treaty shopping. Second, the firms likely to be used for treaty shopping concentrate on a certain part in the network that represents cross-border capital flows. Tax administrations may prevent treaty shopping, only paying attention to firms in specific industries.

The prevention of international tax avoidance is crucial for the achievement of SDGs to generate financial resources. The research suggests that simple legislation and tax administration prevent treaty shopping that governments including developing countries are suffering from.

Policy Framing of Power System Integration Revisited: What are the priorities for ASEAN?

Presenter: Yugo TANAKA* (Kyoto University)

Email: yugo.tanaka.77x@st.kyoto-u.ac.jp

Co-researcher (s): Dr. John CROWLEY (UNESCO*), Dr. Peerapat VITHAYASRICHAREON (International Energy Agency*), Dr. Shutaro TAKEDA (Kyoto University), Mr. Go OKUI (Kyoto University), Mr. Shun YAMAMOTO (Kyoto University), Prof. Shigeki SAKURAI (Kyoto University), Prof. Tetsuo TEZUKA (Kyoto University)

*the researchers contributed to the research personally and the statement in this presentation should not be regarded as official statements of their affiliations.

Keywords: Renewable energy, Electricity, Policy process, Inclusivity

Abstract:

What type of power system is most suitable for ASEAN? The question is not something experts can answer to, though experts' contribution is obviously necessary to answer the question. In this question, the problem that needs to be solved is not clearly defined, and if experts try to define the problem in any form, it would unconsciously or consciously limit a range of possible solutions. Therefore, a careful attention should be made on the way how problem is framed. A typical traditional mode of power system planning assumes a certain form of problem solving, to find an optimal mix of power supply infrastructure to meet the given demand based on the certain preselected criteria. This presentation elaborates on an alternative way of framing the issue, with a planning approach which addresses different sets of priorities. By comparing the two approaches, the authors conclude that the policy process should be reconsidered, where policy framing of power system planning is revisited and carefully examined, so that it creates a room for alternative strategies to be generated and the ASEAN can make the strategical choice based on their own priorities.

This presentation reports the outcome of the high-level forum the authors organized as a side event of the 37th ASEAN Energy Ministers Meeting, namely, "Renewable Energy Development Strategy for ASEAN". The presentation also highlights an important role that academia can play in policy processes towards SGDs, which is to create a new way of policy framing at the same time to engage with stakeholders to revisit it.

Improving cognitive function in elderly people by a 10-week intervention of playing a musical instrument

Presenter: Xueyan Wang* (Kyoto University)

Email: wang.xueyan.66m@st.kyoto-u.ac.jp

Co-researcher (s): Kaoru Sekiyama (Kyoto University)

Keywords: cognition; instrumental music training; elderly people; short-term

Abstract:

Previous studies have reported that cognitive function of musicians could be preserved better than people without musical experience. Starting piano training at old age and continuing it for several month may be also beneficial to improve cognitive function in older adults. Our present study investigates the effect of a 10-week instrumental learning program on elder persons' cognitive functions using a randomized controlled trail. Eighty elder persons (aged 62-87 years) are randomly assigned to either the experimental group (n=40), which received a 10- week (10-session) keyboard harmonica curriculum, or an untrained control group (n=40). Cognitive measurements included working memory, episodic memory, motor function, verbal ability, divided attention, which are administered before and after the training in both groups.

Attempts have been made to automate the cognitive measurements to avoid deviation caused by different examiners. We also intend to develop an automatic self-executable memory test by extending this kind of automated system in the future. Such an automated test may help early detection of pathological decline of cognitive function such as Mild Cognitive Impairment (MCI). If a person detects the impairment by him/herself, attempts to mitigate it (by taking an active lifestyle) can be done without delay.

Keynote Speech 2

Dr. Nuki Agya UTAMA

Nuki Agya Utama was appointed as the **Executive Director of the ASEAN Centre for Energy (ACE)** in August 2019 reporting directly to the Governing Council consisting of Leaders of the Senior Offices on Energy from the ASEAN member states.

Nuki Agya Utama has PhD in Environmental Technology from University of Technology King Mongkut (KMUTT), Bangkok, Thailand and Post-Doctorate at Kyoto University's Graduate School Energy Science. He has extensive experience in the energy industry for about 18 years and 13 years of research/teaching experience at Swiss German University and University of Indonesia. He also involved as programme coordinator at Kyoto University, Japan worked on ASEAN energy planning, demand-supply model and power generation optimisation.

Before taking the assignment as Executive Director, he had worked at PT. Baryon Hasta Persada as a Director, to lead the overall projects on design, engineering, procurement and construction and then with organisations such as UNDP, Thailand and UNEP, Thailand as energy consultant. He had started his career with ENVIMA a German-Thai consulting firm working on renewable energy, energy efficiency and environmental consulting as country manager. He had also served as the Head of Environmental Engineering department at Surya University, Jakarta.

Nuki has authored several publications, in international conferences, journals and scientific article particularly in the field of energy. His interest among others is renewable energy, green buildings and energy efficiency.

ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025 and the SDG 7

Keywords: SDG; ASEAN; energy; cooperation; resilience

Abstract:

World is continuously developing with many challenges and highly vulnerable to risks. In response to the situation, the 17 Sustainable Development Goals (SDGs) were built as a set of universal goals that meet the urgent environmental, political and economic challenges facing our world including issues related to energy and climate change. ASEAN is one of the regions with fastest growth, projected to be the fourth largest economy globally by 2050. In the meantime, the sequence of rapid growth leads to congestion in urban area, bigger gap of inequality, and surging energy demand. Hence, increasing energy supply capacity is a key driver to accelerate ASEAN's development and people livelihoods. The ASEAN Plan of Action for Energy Cooperation (APAEC) (2016-2025) is the regional energy policy framework in ASEAN. With the theme of APAEC, "Enhancing energy connectivity and market integration in ASEAN to achieve energy security, accessibility, affordability and sustainability for all", this is clear that the vision of ASEAN in energy development is in line with the SDG7 on Affordable and Clean Energy. Since the adoption of APAEC, AMS achieved several notable results that push the region towards collective resilience such as energy intensity reduction in 2018 comparing to 2005 level, outstanding growth of renewable energy power plants, higher penetration rate of cleaner alternative fuel vehicle, growth of electrification from grid expansion and decentralized power system, shifting to clean cooking fuel in rural households, and number of renowned power interconnectivity between several AMS. These achievements can be widened as SDG is implemented globally. Aligning with SDG made it possible for regions to work together similarly to how AMS collaborate with each other. In addition, IPCC has recognised the synergies between SDG 7 and the climate change mitigation measures through energy supply and demand, and most of all these measures are not associated with any risk of trade-off. This also indicates that realising the goals of APAEC will indeed contribute to the Paris Agreement's aim of limiting the temperature rise of 1.5oC.

Presentation abstracts

Session 2

Challenges and Solutions for SDGs in Asia

The Problems of Acceptance: The Case Study of Monastic Education School Accepting Ethnic Children in Myanmar

Presenter: Ayaka Watanabe * (Kyoto University)
Email: watanabe.ayaka.85n@st.kyoto-u.ac.jp

Keywords: Myanmar; Ethnic minority; Monastic Education; Migrants

Abstract:

A social integration is an important process for especially refugees, Internally Displaced Persons (hereafter IDPs), migrants and ethnic minorities. This research aims to clarify what is the barrier of social integration for ethnic minority children who came to monastic education school in different city.

The purpose of this research is to consider SDGs Goal 4 (quality education) and Goal 8.7 (eliminate the worst forms of child labor, including recruitment and use of child soldiers); this research aims (1) to understand the situation of monasteries which accept ethnic minority children, orphans and migrants, and (2) to clarify the problem which monasteries are facing. The author conducted semi-structured interviews, participant observation and literature review, and collected data by international organizations and University of Mandalay.

The result shows that (1) there are people who escaped to monasteries in other cities, and monasteries accept orphans and children who came from different ethnic groups. The reason why they start accepting ethnic minority children can be categorized in various ways. In case of S monastery, for instance, monk in Shan state, which is conflict area, asked S monastery 's monk to accept children in 2013. S monastery 's monk decided to open the monastic education school. On the other hand, in case of P monastery, one of the monks went to Shan state to recruit some novices, because at that time there were no novice in P monastery. (2) There were common problems which monasteries are facing. First, language barrier; children speak different languages because each ethnic has different language. Second, since most of the classes are conducted in Burmese, there are education problems because of language barrier. Third, financial problems. However, in order to solve these problems, each monastery is striving.

This presentation describes the problems that monasteries are facing. This can be a first step of my research for social integration process.

Towards SDG N11 - comparative study of 3 cities (East and West) and the evolution of Sustainable City concept in Japan (case study of Kitakyushu SDGs Model City)

Presenter: Myasoedov Fedor (Kyoto University, GSAIS)

Email: myasoedov.fedor.62r@st.kyoto-u.ac.jp

Keywords: sustainable cities; stakeholder engagement; sustainable city policies

Abstract:

More than half of world population lives in cities today, with 60-80% of energy consumption and 75% of world's carbon emissions. The importance of sustainable urban development cannot be overestimated. If taking a strong critical stance, cities are essentially unsustainable, since they are characterized by high concentration of population with high consumption of resources and waste production, and therefore, they exceed the ecological thresholds and carrying capacity of the land where cities are located. On the other hand, cities offer the biggest potential for reducing the environment impact on the hinterland and getting closer to realizing Sustainable Development (SD), through various policies promoting compact city design, circular use of material flows, utilizing communities' social capital, etc. Embracing this fact, various cities and nations have been proposing their own Sustainable City policies and Action Plans such as "Green Growth City", "Low-carbon city" among many others. Japan currently has 3 on-going national Sustainable City policy frameworks: Eco-Model City (since 2008), FutureCity (since 2012) and SDGs FutureCity (since 2018).

The 1st part of this presentation builds on the insights from the document review of 3 case cities: Stockholm (Sweden), Portland (United States) and Kitakyushu (Japan). The research explored - *Why these cities claim to be sustainable? What were their actions and policies toward SD? What have been the critical perspective on these efforts?*

The outcomes of that explorative analysis highlight strong and weak points of each city on their path to sustainability, as well as what were the shared factors of success for improving sustainability in these cities. One such factor shared by all 3 cities was strong collaboration between all stakeholder groups (Local government, NGO's, Community groups, Businesses, Academia) which is also emphasized as SDG N17: "Partnerships for the goals".

The 2nd part will focus on how sustainable city concept was evolving in Japan, investigating the case of Kitakyushu City with its long history of environmental action and its various efforts toward SD. Employing qualitative fieldwork methods (in-depth interviews and observations), the research is taking into perspective views of various city stakeholders on the city's movements towards embracing sustainability.

The results will reveal enabling factors towards achieving SDGs as well as controversies, both of which have important implications for researchers and policy-makers inside and outside Japan for harmonizing urban policies with SDGs.

Plastic Waste Management through Visualization of Individual's Effort and A.I. Recycling Technologies

Presenter: Hui Chun Wai Jimmy (Kyoto University)
Email: hui.wai.32e@st.kyoto-u.ac.jp

Co-researcher (s): Yuki Hara, Wen-Hao Jiang, Xu-Qin Yu, Tomoya Kato, Jung-Uen Joo, Ngoc-Tram Lam, Kan Yonako, Felicity Yeboah Dokyi

Keywords: plastic waste management; A.I. recycling technologies; visualization of efforts

Abstract:
In 2018, China banned the import of solid waste from other countries due to the concern of the domestic environment. By this policy, plastic waste management became a global urgent issue in recent years because 45% of the world's plastic waste imported to China since 1992 such as wastes from Hong Kong, Japan, England, Korea, USA, etc. The recycling capacity of developing countries cannot handle all the wastes and usually a large part of them were not properly processed which includes dumping into the ocean and landfill. In this project, we discussed 2 approaches to improve the plastic waste management which consist of reducing total waste by consumers and increasing recycling capacity with A.I. empowerment. Our first solution is to change consumer behavior by building visual communication through creative design methods in order to remind consumers of plastic issues. The start-point of this idea is to concretize and visualize the impact of individual's effort on the environment to over-come the free-riding problem. We think this kind of daily movement is not difficult and it can encourage customer to avoid using plastic products. The second solution is to establish an A.I. system to boost recycling capacity. This A.I. system can exclude non-recyclable low-quality garbage; identify dirty garbage that required additional process and classify garbage by how to process.

Figure. Visualization of individual's effort (*left*); A.I. recycling machine in Shanghai (*right*)

Reducing Food Waste in Japanese Combini: A Case Study

Presenter: ZHOU Chuying (Kyoto University)

Email: zhou.chuying.75m@st.kyoto-u.ac.jp

Co-researcher (s): O Honja, Kim Eunyoung, Yang Xing, Kakami Shino, Chiang Longwen, Yip Chingwan, Meng Hanqing, Takekuma Gentaroh and Norbert Agbemenu (BXAI institute 2019 summer program participants)

Keywords: food waste; Japanese convenience store; sustainable development

Abstract:

With the purpose of achieving sustainable development goals (SDGs), our proposal aims to combat food waste problem in convenience stores in Japan and to provide affordable food options for local low-income families. According to studies, there are around 57,000 convenience stores in japan, selling prepared meals like lunch boxes and rice balls which would be expired and removed from shelves two days after production. Those fresh meals bring customers convenience, however, there is no efficient or sustainable way to handle that great number of food waste daily. Moreover, recent survey suggests that actually 86% of Tokyo citizens think that fresh meals shortly after their best-before date is still edible. Therefore, based on the severity of food waste problem and people's lowered psychological barrier for expired food, we propose a simple solution by building an application on mobile devices, which could collect information about expiring food from convenience stores and send out discount information to users nearby. In addition, with support from Japanese government, we could identify people in need with the My Number Card system and provide further discounts for them to collect expiring food in convenience store. By implementing this system, not only can convenience stores achieve efficient food redistribution, improve customer loyalty and realize their social impact, but it also helps local communities to be more sustainable.

Poster session abstracts

Solar energy for poverty alleviation: a critical evaluation of poverty alleviation projects (PAP) in Jinzhai, China

Presenter: Jin Zhe (the Graduate School of Advanced Integrated Studies in Human Survivability (GSAIS), Kyoto University)

Email: jin.zhe.47c@st.kyoto-u.ac.jp

Keywords: solar PV, poverty alleviation, sustainability

Abstract:

The purpose of this research is to examine the outcomes of solar energy for poverty alleviation projects (SEPAP) in Jinzhai county, China.–As one of the ten 'targeted poverty reduction projects' in China, SEPAP works by installing solar photovoltaic (PV) panels on farmland or on rooftops. The three main reasons-why the Chinese government launched this project are huge income gap, problems of solar industry and problems of rural electrification. Since launching the pilot PAP projects in 30 counties in the provinces of Ningxia, Anhui, Shanxi, Hebei, Gansu and Qinghai in 2014, PAP has been implemented at an astonishing speed. The National Energy Administration (NEA) released the first group of solar PV poverty alleviation projects in 2016, amounting to 5.16GW. This list included 2.18GW village-level power stations and residential PV projects, and 2.98GW of centralized (large-scale) PV projects. Jinzhai county was chosen as the place for this case study since Jinzhai has been promoted as a successful model for PAP project development. However, the economics analysis (Net present value and Internal rate of return) of two different types of solar projects showed the importance of government's subsidy to the projects, although poor people indeed benefited from this project.

Table: NPV and IRR of two types of SEPAP from different perspectives

Solar Projects from different perspectives	Net Present Value (NPV)	Internal Rate of Return (IRR)
3KW(Individual Level) from the poor people's perspective	19,865.54Yuan	43.845%
3KW(Individual level) from government's perspective	-$8,755.40Yuan	3.714%
100KW (Village Level) from the poor people's perspective	455,723.21Yuan	26.893%
100KW (Village Level) from government's perspective	-$281,262.59 Yuan	3.425%

Can Green Growth Policies Help Reduce Inequality in Thailand?

Presenter: Reo Hirata* (Kyoto University)
Email: hirata.reo.66z@st.kyoto-u.ac.jp

Keywords: inequality; green growth policies; Thailand; SDGs

Abstract:
The purpose of this research is to examine whether the green growth policies can help reduce inequality in Thailand. One research stated that "There is no doubt that environmental change is affecting the poor disproportionately, whereas growth is essential for poverty reduction" (Stefan Dercon, *Is Green Growth Good for the Poor?* 2012). The other showed that "the more unequal a society (in a sense that will be made more precise below), the more resources will be used to sustain growth despite its negative impact on the state of the environment" (Hubert Kempf and Stephane Rossignol, *Is Inequality Harmful for the Environment in a Growing Economy?* 2007). Furthermore, it is said that "higher inequality increases demands for economic growth, which in turn causes more ecological stress" (Daniel J. Fiorino, *A Good Life on a Finite Earth* 2018). From these literatures, there is a close relationship between the inequality and environment in terms of the economic growth through green growth.
First, the author distinguished the inequality of "outcome" from that of "opportunity".
Second, the inequality of outcome was analyzed by Gini Coefficient (expenditure-based), which is generally used as a measure to show the inequality. The score in Thailand in 2017 was 0.365 (*World Bank Open Data*), and it is on declining trend during last ten years. Furthermore, the income gap between top 10% income group and bottom 50% is shrinking (Thanasak, *Democratisation and the Emergence of Class Conflicts Income Inequality in Thailand, 2001-2016*, 2018). However, the income gap between the agricultural and non-agricultural production, and rural and urban areas (specifically Bangkok and Eastern) has increased (*Office of the National Economic and Social Development Council Statistics*). Therefore, the inequality issue remains one of the most urgent problems in Thailand.
Third, the green growth was written at Strategy four of "The Twelfth National Economic and Social Development Plan", which is the main national plan in Thailand. In this plan, in order to achieve the create a just society and reduce inequality (Strategy two of that plan), all development dimensions, including the green growth, have to integrated. The strategy four includes some actions, which aim to conserve, to build natural security, to achieve better environment quality, and to lessen the impact from climate change.
In consequence, this research will lead to the achievement of Sustainable Development Goals (SDGs), particularly "Reduced Inequalities" (SDGs 10) and "Climate Action" (SDGs 13). However, further studies are needed because this research is currently in progress.

Re-Thinking the Malapportiontment Problem from the Democratic and Representative Efficiency

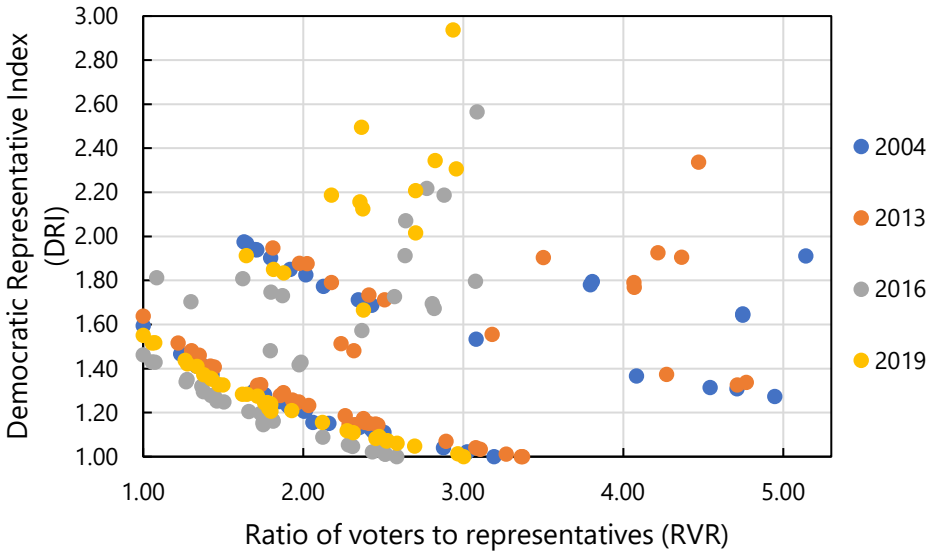
Presenter: Akiko Tanimoto* (GSAIS, Kyoto Universityity)
Email: tanimoto.akiko.88e@st.kyoto-u.ac.jp

Co-researcher (s): Wenruo Lyu, Liang Zhao (GSAIS, Kyoto Universityity)

Keywords: electoral malapportionment; democracy; representative efficiency

Abstract:

Apportionment is the process by which seats in a legislative body are distributed among administrative divisions entitled to representation. A common method to do so is apportionment by district, e.g., the parliamentary system in the USA, Japan, and so on. An important issue in this process, called the malapportionment problem, occurs when different electoral districts have different ratios of voters to representatives (RVR). This issue has attracted great attentions from many people including lawyers, researchers and others for many years, yet it has not been solved at all. (Lyu&Zhao, 2019) For the problem, Japan has practiced discussions, lawsuits, judgments by the Supreme Court, and re-distributions for many years to reduce the divergence of RVR. However, while the RVR is of course important, this study proposes a novel index called **the democratic representative index (DRI)**, which should not be neglected as well in distributing seats to districts. We show that an optimal distribution according to this index is different from the one by RVR. By comparing the differences in the Japan case, this study shows the inequality of DRI is getting greater by seat re-distribution only considering RVR. Finally, a re-distribution algorithm is proposed to the malapportionment problem with better trade-off between RVR and DRI.



Keynote Speech 3

Nobuko Kayashima

Senior Vice President

Japan International Cooperation Agency (JICA)

Principal Research Fellow, JICA Research Institute

She joined JICA after graduating from Kyoto University in 1982, and has been playing a key role in the planning and operation of JICA's education cooperation programs.
Prior to her current assignment, she served as Director of JICA-RI (2016-2018), Senior Advisor for Education (2014–2016), Director General of the Human Development Department (2009–2014), Chief Representative of JICA Bangladesh Office (2007–2009), and Group Director for Basic Education (2004–2007). She received her Ph.D. (in international development) from Nagoya University. Her current research interests include education cooperation, internationalization of higher education, and university participation in ODA.

Title: New Challenges in Education Development in the Era of SDGs.
Speaker: Dr. Nobuko Kayashima (JICA)

Abstract:
After outlining the Japanese Government's policy and JICA's programs on SDGs as a whole, SDG4 on education will be taken up and discussed in detail. SDG 4 is the education targets to be achieved before 2030 by all countries of the world, covering the various aspects of educational development from early childhood education to higher education. The speaker will explain the current situation of education in Asia, focusing on its new challenges, and introduce some of the new initiatives under SDG 4. Finally, the point that education plays the cross-cutting role in achieving all of SDGs will be raised.

Panel Discussion

What can academia do for SDGs in Asia?

Short CV in English

Dr. Mbuli Charles Boliko, a national of the Democratic Republic of the Congo, holds a Bachelor's degree in Psychology and a Master's degree in Industrial Psychology from the University of Kisangani, D.R. Congo. He taught at the Institut Supérieur de Commerce (Business College) in Kinshasa, D.R. Congo from 1988 to 1990, and joined Nagoya University where he became one of the first students who started the Graduate School of International Development (GSID) in April 1991; he obtained a Master's degree in International Development in 1993 and a Ph. D. in the same area in 1996. After a bit over one-year of teaching at GSID, Dr. Boliko joined FAO in Rome as Personnel Officer in 1997. From 1998 to 2003, he served as Liaison Officer in the FAO Liaison Office with the United Nations in New York, before being transferred to the Office of the Director-General in Rome as Attaché de Cabinet, and was promoted to the position of Senior Attaché de Cabinet in 2008. In 2009, he took up the position of Chief, Recruitment and Staffing Branch in the Human Resources Management Division. In August 2013, Dr. Boliko was appointed Director of the FAO Liaison Office in Japan. He is also a Visiting Professor of the Catholic University of the Congo where he teaches "Human Resource Management" and "Administration and Development".

Septia Buntara Supendi

Manager, ASEAN-German Energy Programme, ASEAN Centre for Energy

Septia is Manager for ASEAN-German Energy Programme (AGEP) Department at the ASEAN Centre for Energy (ACE). He leads the implementation of collaborative partnership programme between ACE and Die Deutsche *Gesellschaft für Internationale Zusammenarbeit* (*GIZ)* which covered the area of renewables and energy efficiency. Prior to AGEP, he is in charge to support the monitoring of the implementation of ASEAN Plan of Action for Energy Cooperation (APAEC), a blue print document for ASEAN energy development for the period of 2016-2025 covering on i) ASEAN Power Grid, ii) Trans ASEAN Gas Pipeline, iii) Clean Coal Technology, and iv) Regional Energy Policy and Planning. Septia holds undergraduate and engineering master's degree from National University of Malaysia and Institut Teknologi Bandung.