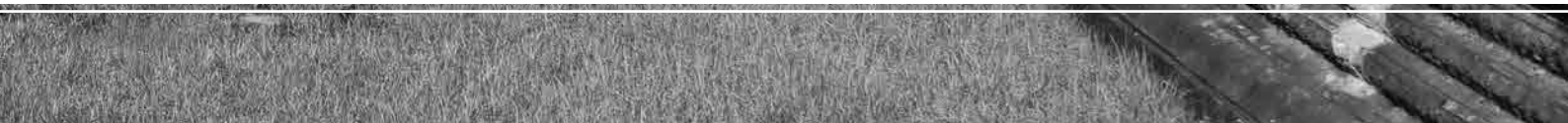
Cambodia-Japan Symposium on Ecotechnologies

"Conversion to Achieve Eco-society through the Industry-Government-Academia Collaboration toward Sustainability & Quality of Life"

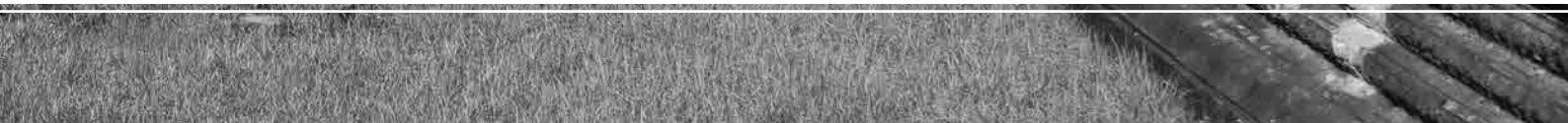
12–13 December 2019
Jointly organized by Honda Foundation &
Royal University of Phnom Penh

公益財団法人 本田財団
HONDA FOUNDATION

Contents



Program Day 2 (13th Dec.)



For Publication

Conversion to Achieve Eco-society through the Industry-Government-Academia Collaboration toward Sustainability & Quality of Life

The present report is an account of the speeches and remarks from the international symposium entitled "Conversion to Achieve Eco-society through the Industry-Government-Academia Collaboration toward Sustainability & Quality of Life" held on Dec 12–13, 2019 in Phnom Penh, Cambodia. This symposium is jointly organized by the Royal University of Phnom Penh, and Honda Foundation. The Royal University of Phnom Penh (RUPP), one of the oldest and largest public universities in Cambodia, opened in January 1960, began its master's program in 2001 with a commitment to higher education.

The goal of the symposium was to discuss how we should promote innovation to support the sustainable development of science and technology in harmony with the human and natural environments, focusing on inclusive and sustainable smart city and career development for future Eco-society. On the first day, speakers with varied experience from diverse fields including academia, research institutes, industry, and governmental organizations provided insightful observations and opinions to an audience, and we held three panel discussions. On the Second day, we held two panel discussions inviting Honda Y-E-S awardees and RUPP students as panelists.

This was the first symposium having panel discussions inviting Y-E-S awardees as well as university students as panelists. The experts and young scientists had actively discussed various issues to realize the inclusive society and how we should work together toward sustainable future.

We hope this activity had made some contribution to sharing the value and ecotechnology among the participants and strengthening the relationship between Cambodia and Japan in the field of science and technology.

At Honda Foundation, our founding prospectus states that our mission is to contribute to "creating a truly humane civilization." It is our fervent hope that the discussions and friendships cultivated through this symposium will contribute to the realization of a truly humane society of the future.

Akihiro KAMEOKA
Managing Director, Honda Foundation

Profile of Participants

Day 1 Welcome Session & Opening Remarks

Welcome Session

Cambodian Speaker

H.E. Dr. Chealy CHET, Rector of RUPP

Chet Chealy actively involves in three realms, public, civil society and academic sectors in Cambodia. He began his work at Cambodia's Ministry of Education, Youth and Sport in 1986. Chealy was a deputy Secretary-General of Accreditation Committee of Cambodia (ACC) from 2003 to 2007 and a deputy Secretary-General of Economic, Social and Cultural Council (ECOSOC) of the Office of Council of Ministers from 2007 to 2009. He was assigned by the Royal Government of Cambodia as Cambodia's Alternate Representative to ASEAN Intergovernmental Commission on Human Rights (AICHR) for 2009–2012 term when ASEAN Human Rights Declaration was developed and adopted.
Chealy is now rector of Royal University of Phnom Penh and vice president of Cambodian Human Rights Committee with ranking equivalent to minister. He is also assigned by the Royal Government as a national expert on anti-corruption to the United Nations.
Dr. Chealy earned his MA and Ph.D. degree in International Development from Nagoya University, Japan. His research interest includes higher education, human rights, and public management.

Japanese Speaker

Mr. Hiroto ISHIDA, President of Honda Foundation

Hiroto Ishida has been President of Honda Foundation since 2011. He received his B.A. in Nuclear Engineering from the University of Tokyo Faculty of Engineering in 1964 and obtained M.A. in Political Science at the University of Illinois in 1970. In 1964, Ishida joined Science and Technology Agency ("STA"). After Vice Minister of STA from 1995 to 1998, he was appointed to the Ambassador to Czech Republic from 1999 to 2003. In 2004, he was appointed to President of Kanazawa Gakuin University, in 2005 he was appointed to the General Manager of National Museum of Emerging Science and Innovation. In 2010, he became President Emeritus of Kanazawa Gakuin University. In 2018, he became Chairman of Public Komatsu University. Currently besides Honda Foundation, he is the Chairman of Nuclear Safety Technology Center, President of Maeda Ikutoku Foundation, Chair of Association for Traditional Performing Arts of Japan and Member of Management Council of the National Graduate Institute for Policy Studies.

Opening Remarks

Cambodian Speaker

H.E. Dr. Visalsok TOUCH, Secretary of State, Ministry of Education, Youth and Sport

Dr. Touch Visalsok is currently Secretary of State of Ministry of Education, Youth and Sport (MOEYS), Kingdom of Cambodia, in charge of quality assurance of higher education in Cambodia. He has been educated both in-country and abroad. After obtaining his Bachelor Degree of Science in Chemistry from Royal University of Phnom Penh (RUPP) in 1993, he joined Royal University of Agriculture (RUA) as a lecturer in Chemistry. He obtained his Master Degree in Agricultural Science from The University of Queensland (UQ), Australia, in 1999 and Doctor of Philosophy (majoring in food science) from Ehime University, Japan, in 2004. In 2005, he joined UQ again as a post-doctoral fellow conducting his research on dairy science.
He served as Dean of Graduate School of RUA from 2004 to May 2008, and Rector of University of Battambang (UBB) from June 2008 to 2013 before being appointed to be Under-Secretary of State of MOEYS in 2013 and Secretary of State of MOEYS in 2018.
Dr. Touch Visalsok has been involved in teaching and doing research on education, agriculture and management and has been authors and co-authors of a number of research articles, peer-reviews and chapters and books in reputed international journals.

Japanese Speaker

H.E. Mr. Masahiro MIKAMI,

Ambassador Extraordinary and Plenipotentiary of Japan to the Kingdom of Cambodia

Career at MOFA

1986.4 Joined Ministry of Foreign Affairs (MOFA)
2008.1 Director, First Middle East Division
2009.7 Director, Press Affairs Division, Minister's Secretariat
2010.7 Director, International Legal Affairs Division
2014.9 Deputy Director-General, European Affairs Bureau
2015.1 Deputy Assistant Vice-Minister (Parliamentary Affairs)
2016.7 Deputy Director-General, International Legal Affairs Bureau
2017.7 Assistant Minister, Director-General of International Legal Affairs Bureau

Overseas Posts

1989–1991 Second Secretary, Embassy of Japan in Egypt
1999–2001 First Secretary, Embassy of Japan in the U.S.A.
2001–2003 Counsellor, Embassy of Japan in Thailand
2012–2014 Minister, Embassy of Japan in China
2019.7– Present Position

Education

1986.3 The University of Tokyo (LL. B.)
1989.6 Oxford University (P.P.E.) (M.A.)

Teaching Career

Visiting Lecturer at Kyushu University (Graduate School of Law), Waseda University (Faculty of Law), Chuo University (Faculty of Law), University of Tokyo (Graduate School of Public Policy).

Day 1 Keynote Speeches

Economic Diversification

Cambodian Speaker

H.E. Dr. Kalyan MEY, Senior Advisor, Supreme National Economic Council, Royal Government of Cambodia/Chair of Board of Trustees of RUPP

Currently, he has three official positions in the Royal Government of Cambodia as: (1) Senior Advisor (Minister rank) to the Supreme National Economic Council (SNEC), an economic think tank to the Prime Minister; (2) Chairman of the board of the Royal University of Phnom Penh (RUPP); and (3) Chairman of Cambodia Development Resource Institute (CDRI). He is also: (a) Chairman of Cambodia-Japan Association for Business and Investment (CJBI); (b) Chairman of Cambodian Agriculture Cooperative Corporation (CACC) with more than 5,000 farm households; (c) Chairman of Center of Policy Studies (CPS); (d) Independent board director of CIMB bank, Cambodia; and (e) Independent board director of Prudential Life, Cambodia. Before that, he has worked for more than 20 years as senior economist and country director at the UN/FAO-World Bank Cooperative Program based in Rome, Italy. He worked also as financial officer of Kanematsu Gosho Co., Ltd. a Japanese trading house, in Osaka and Tokyo in mid-1980's. He earned his doctor degree in 1984 in development economics from Kobe University, Japan. Now, he is happy to be back home in Cambodia since 2008, after spending 35 years abroad. He is using experience acquired while study and work in Japan as well as in the world to help the development of Cambodia and the Asia region.

Japanese Speaker

Dr. Michiharu NAKAMURA,

Counsellor to the President of Japan Science and Technology Agency, Japan (JST), Member of UN IATT-STI 10

Dr. Nakamura graduated from the University of Tokyo and joined Hitachi Central Research Laboratory in 1967, where he was engaged in compound semiconductors and optoelectronics research. He is entitled an IEEE fellow and a JSAP fellow for his pioneering achievements in optoelectronics. In 2004, he was appointed to Executive Vice President and Executive Officer of Hitachi Ltd. and then the Board of Directors. He was responsible for corporate technology development and new business incubation. In 2011, he assumed the office of the President of Japan Science and Technology Agency (JST), where policy-driven R&D funding is a major mission. After completing four-year presidency, he has been serving as the Counsellor to the President of JST. He is currently serving as the Deputy Chairman of the Engineering Academy of Japan, a member of the Advisory Board for Promotion of Science and Technology Diplomacy and a member of the UN 10 Member Group supporting the Technology Facilitation Mechanism for STI for SDGs.

Day 1 Session 1

Inclusive and Sustainable Smart City

Cambodian Speaker

H.E. Dr. Rethy CHHEM, Minister attached to Prime Minister

Professor CHHEM Kieth Rethy is a medical doctor, science diplomat, educator and historian with extended experience in Digital Science & Technology, Global Health Diplomacy, Nuclear Technology Policy, and Executive Education. He was Professor of Radiology in Canada, Singapore, Austria and Japan for 30 years. He was the Chair of the Radiology and Nuclear Medicine Department of University of Western Ontario. He was the Director of the Division of Human Health at the International Atomic Energy Agency (IAEA). He holds a MD, a PhD in Education and a PhD in History. He published more than 100 scientific articles and edited 17 textbooks. He was invited keynote speaker in more than 70 countries. Over the last 3 decades, he developed a deep expertise in international development, digital transformation, and nuclear science Communication. From 2014 to 2019, he was the Executive Director of the Cambodian Development Resource Institute (CDRI), a leading think tank in Cambodia, that ranked at the Top 100 of the University of Pennsylvania Global Think Tank ranking. He is also a member of Advisory Board of the International Center for Higher Education Innovation (UNESCO) at the Southern University of Science and Technology in Shenzhen. He is a distinguished visiting professor at the Atomic Bomb Disease Institute, Nagasaki, Hiroshima and Fukushima Medical University. He is a cofounder of China Studies Center at CDRI. He is an international advisor to the China Institute of International Studies in Beijing and a Senior Fellow at the Asia-Pacific Fellows Network of the East West Institute in New York City.
In May 2019, Professor CHHEM Kieth Rethy was appointed by royal decree, Minister Delegate, Attached to the Prime Minister.

Cambodian Speaker

Dr. Chanthy LAY, Deputy Head of Research Office, RUPP

Dr. Lay Chanthy is a deputy head of research office of the Royal University of Phnom Penh (RUPP). He is a senior lecturer at the Royal University of Phnom Penh in field of environment. Dr. Chanthy obtained his Master and Doctoral degrees in Urban Environmental Management in 1999 and 2010, respectively, from the Asian Institute of Technology (AIT), Bangkok, Thailand. Since 1996 to present, he has studied and worked mainly in environmental management, particularly in areas of urban environment, waste management, impact assessment, and climate change. He has substantial working and researches experiences on these areas. In addition, he has served as freelance consultant for various ADB, World Bank, and development partners projects in Cambodia. Dr. Chanthy's research papers were mainly published at international journals including journals of Environmental Impact Assessment Review, Waste Management and Research, Environmental Management, Environment and Urbanization, and journal of Resource, Recycling, and Conservation.

Japanese Speaker

Dr. Akinori MORIMOTO,

Professor, Waseda University, Faculty of Science and Engineering/School of Creative Science and Engineering

Prof. Morimoto Akinori graduated from Waseda University's Graduate School in 1989. He worked as assistant professor for Waseda and Utsunomiya Universities, as researcher for MIT and most recently as professor at Utsunomiya University. Currently he is professor at Waseda University's department of Civil and Environmental Engineering.

Japanese Speaker

Dr. Shizuo IWATA, Chairman, ALMEC Corporation

Dr. IWATA, a founder and chairman of ALMEC Corporation based in Tokyo, has been engaged in urban and transportation planning fields in developing cities for more than 50 years for JICA and other international organizations including the World Bank (WB) and Asian Development Bank (ADB) as a consultant.
His areas of activities are mainly in Asia including Vietnam, the Philippines, China, Indonesia, Thailand, Myanmar, Malaysia, Singapore, Mongolia, Bangladesh and others.
He leads teams of consultants with a wide range of expertise to undertake many large-scale multi-disciplinary strategic studies. He was also a visiting professor of the Graduate School of Waseda University in Japan and contributed in establishing the Transportation Science Societies in the Philippines, Mongolia, and Vietnam. Dr. Iwata obtained his doctorate in Engineering from the University of Tokyo with his thesis on public transportation development in large urban areas of developing countries.

Panel Discussion 1 Moderator

Dr. Soth SOK, Dean, Faculty of Education, RUPP

Dr. Sok Soth graduated from De La Salle University, Philippines with a Master's Degree in Language Teaching. In 2013, he obtained his Ph.D. in Education from Victoria University, Melbourne, Australia. For more than ten years, Soth has been an Applied Linguistics lecturer, researcher, and teacher trainer at the Department of English (DOE), Institute of Foreign Languages (IFL), RUPP. He became the BA coordinator in DOE, IFL from 2013–15. Since 2015, Soth has been the faculty representative for the Board of Trustees of RUPP. In 2016 he was appointed Dean of the Faculty of Education, RUPP. He also is the head of the strategic team, a think tank for RUPP. In addition to his management roles, Soth is also supervising postgraduate students in both MA in TESOL and M.Ed. at RUPP.
Soth's teaching and research interests focus on language and culture, particularly how they both influence each other in one's conception and performance of self in his/her being and becoming. Soth is also interested in comparative education, education internationalization, and dropouts.
Presently, Soth is conducting and co-conducting various research projects related to dropouts, and Gender Responsive Education, adaptive teaching and learning approach research. He is currently supervising WB project for secondary school teachers and principals upgrading.

Panel Discussion 1 Panelists

H.E. Dr. Rethy CHHEM, Minister attached to Prime Minister

Dr. Chanthy LAY (following Session 1), Deputy Head of Research Office, RUPP

Dr. Akinori MORIMOTO (following Session 1),
Professor, Waseda University, Faculty of Science and Engineering/School of Creative Science and Engineering

Dr. Shizuo IWATA (following Session 1), Chairman, ALMEC Corporation

Day 1 Session 2

Private Sector Involvement in Human Resource and Career Development for Future Eco-society

Cambodian Speaker

Mr. Hong Kok CHEA,

Director of Macroeconomic and Fiscal Policy Department, Secretariat, Entrepreneurship Development Funds, the Ministry of Economy and Finance

Mr. CHEA Kok Hong is a senior economist and a director of macroeconomic and fiscal policy department. He has a well-rounded experience in analyzing and formulating macroeconomic, tax and private sector supporting policies. His significant initiatives include the government tax policy reforms, the Skills Development Fund, SMEs tax incentives and the Entrepreneurship Development Fund.
Mr. Kok Hong graduated master's degree in Public Policy from Lee Kuan Yew School of Public Policy, National University of Singapore. He has attended in a variety of executive training programs including economic policy, entrepreneurship, leadership, digital government, tax policy and administration, etc. from well-known institutions and universities such as IMF, World Bank, ADB, Harvard University, Stanford University and University of California, Berkeley.

Cambodian Speaker

Mr. Sopagna SEANG, Vice-President of Young Entrepreneur Association of Cambodia

Mr. Seang Sopagna is currently President of Cambodia-ASEAN International Institute and Managing Director of Bridge International Translation Company. He is also a co-director for Public and International Relations of the Asian Association of Translation Industry based in Bangkok, Thailand and Vice President of Young Entrepreneurs Association of Cambodia. Currently, he is also a board member of Cambodia Development Center, a development and policy research think-tank of Cambodia.
Before that he held several key positions with both local and international entities, i.e., Forte Insurance (Cambodia) Plc. as a Senior Executive for Training and Development and the Khmer Rouge Tribunal as a Senior Interpreter. He was the president of Australian Alumni Association of Cambodia from 2012–2014 and President of SSEAYP International Cambodia from 2004–2006. He has taught in various universities in Phnom Penh. He got accredited as a certified master trainer for ASEAN In-company Training. He has become an executive coach and trainer for more than ten years in management, leadership, public speaking, business writing, finance, and marketing.
Mr. Seang Sopagna holds Master's Degree in Public Policy and Management from Carnegie Mellon University, Australia and Master's Degree in Economics from Royal Academy of Cambodia.

Japanese Speaker

Dr. Tomohiro FUJITA,

Founder & CEO of Chitose Group/(Member of Bioeconomy Strategy Council, CABINET SECRETARIAT)

Born in 1973. Graduated from The University of Tokyo, Graduate School of Agriculture and Life Sciences. Throughout his time in university, Dr. Fujita was thinking how to create a society based on biotechnology that is necessary to humans and how to create a society where everyone can do whatever they eager to do. He swore to seek a way to implement biotechnology in society not as a scholar but as a businessman. While learning actual business management at the Strategy Consulting Department in Accenture Japan Ltd., he studied the concepts and perspectives of business and human resource management that is required to realize the society he wants to create.
After that, starting with Chitose Laboratory Corp., he established numerous social problem-solving biotechnology companies and grew members working there. He is looking for a better way to turn cutting-edge biotechnology into businesses and provide them to society, from the perspective of mankind a thousand years from now and what they think are businesses that the 21st century should be engaged in. He has been assigned as a member of bioeconomy strategy council in the cabinet secretariat office and support establishment of innovation policy for development of the bio industry.

Japanese Speaker

Mr. Kei IINUMA,

Incubation and Investment Manager, KSP, Inc.
(Kanagawa Science Park, which is the 30-year old largest Science Park in Japan)

Mr. Iinuma graduated from WASEDA University and joined Bank of Tokyo (currently MUFG Bank, Ltd.) in 1992, where he engaged in corporate finance in Kamata Brunch, Beijing Brunch, etc. In 2000, he joined Taiwan Venture Capital as a founding member and also Kawasaki Business Incubation Center as a founding member. In 2007, joined KSP, Inc. He has been mainly involved in KSP Biotech Lab. in Life Innovation Center as a founding member. He participated in an Expert Group Meeting on Science and Technology Park organized by United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP) in 2018. "Establishing Science and Technology Parks: A Reference Guidebook for Policymakers in Asia and the Pacific." was issued based on the discussion.

Panel Discussion 2 Moderator

Dr. Hirohisa UCHIDA,

Executive Director of HOF, Distinguished Professor, Tokai University/
President and CEO, KSP Inc.

Dr. Hirohisa Uchida, Distinguished Professor of Tokai University (TU), is acting as President/CEO of KSP (Kanagawa Science Park) Inc., Japan to foster start-ups/venture companies, and to provide a global platform for entrepreneurs. He is working with many research/science parks in Asia as Honorary President of ASPA (Asian Science Park Association). His experience with university-industry-government collaboration and fostering university-led venture has been accumulated during his work at TU for 40 years. He served as Professor of Departments of Applied Physics/Nuclear Engineering, TU. He contributed to university's management as Board of Trustee, Vice Chancellor, Dean of Schools of Engineering/Information & Design Engineering, etc. His activity is extended globally as members of UNESCO University-Industry-Government Collaboration Committee, International Advisory Board of King Abdulaziz University, Saudi Arabia, and as Representative in Japan of Federal State of Baden-Württemberg, Germany, for economic and industrial promotion. In his expertise, he is active in realizing a hydrogen society as Fellow/Vice President of International Association for Hydrogen Energy. He received Dr. rer. nat. from University of Stuttgart and was researcher at Max-Planck-Institute for Metals Research, Germany (75–81). He published 293 research papers, 21 books, and 201 newspaper columns. Based on his academic achievement, he is Honorary Member of German Society of Materials (DGM).

Panel Discussion 2 Panelists

Mr. Hong Kok CHEA (following Session 2),
Director of Macroeconomic and Fiscal Policy Department, Secretariat,
Entrepreneurship Development Funds, the Ministry of Economy and Finance

Dr. Tomohiro FUJITA (following Session 2),
Founder & CEO of Chitose Group/(Member of Bioeconomy Strategy Council, CABINET SECRETARIAT)

Mr. Sopagna SEANG (following Session 2), **Vice-President of Young Entrepreneur Association of Cambodia**

Mr. Kei IINUMA (following Session 2), **Incubation and Investment Manager from KSP, Inc.**

Day 1 Wrap-Up Panel Discussion

Wrap-Up Panel Discussion for STEM Human Resource Development for Next Generation

Wrap-Up Panel Discussion Moderator

Prof. Tateo ARIMOTO,
Executive Director of HOF/Visiting Professor, National Graduate Institute for Policy Studies/Principal Fellow, CRDS at Japan Science and Technology Agency (JST)

Tateo Arimoto is Visiting Professor and Deputy Director, Science, Technology and Innovation Policy Research Center at the National Graduate Institute for Policy Studies (GRIPS) and also Principal Fellow at Japan Science and Technology Agency (JST) and Vice Director General, International Institute for Advanced Studies.
He served as Director General of Science & Technology Policy Bureau of the Ministry of Education and Science and held the position of Executive Research Fellow at the Economic and Social Research Institute of the Cabinet office.
He has played an active role in public policy making and implementation in the area of science, technology and innovation in Japan and is a major promoter of science of STI policy with multidisciplinary approach.
He has been a co-chairperson of the OECD study projects on "Scientific advice," "Research funding system" and "Transdisciplinary research." He is a member of the program committee of the International Network for Government Science Advice (INGSA), the special committee of Science Diplomacy at the Ministry of Foreign Affairs of Japan, and United Nations STI Forum for Sustainable Development Goals.

Wrap-Up Panel Discussion Panelists

Dr. Chan Oeurn CHEY, Vice Dean, Faculty of Science, RUPP

Chan Oeurn Chey graduated his PhD from the Department of Science and Technology, Institute of Technology, Linköping University, Sweden in January 2015. He is working as person in charge of Graduate School of Science at the Royal University of Phnom Penh (RUPP). Chan Oeurn also works as a vice dean of the Faculty of Science, in charge of research and international relations, of RUPP. He also works as teacher trainer and team leader for Cambodia team for the Asian Physics Olympiad (APhO), International Physics Olympiad (IPhO), Search for SEAMEO Young Scientists (SSYS), APT-JSO and Global Natural History Day (GNHD) competitions. Currently, he is working as the project coordinator for science program in the Sweden-RUPP bilateral program (2019–2023) and as coordinator of research component at RUPP for Higher Education Improvement Project (HEIP 2018–2023).

Dr. Junichi TAKADA,
Professor and Vice President for International Affairs, Tokyo Institute of Technology

Junichi Takada has been vice president for international affairs at Tokyo Institute of Technology (Tokyo Tech) since March 2019. He concurrently serves as a professor at the School of Environment and Society, and the director of the Center for International Education.
He received Doctor of Engineering degree in Electrical and Electronic Engineering from Tokyo Tech in 1992. After serving in Chiba University for two years, he was as an associate professor at Tokyo Tech until 2006, when he became a professor. He served as the chair of the Department of Transdisciplinary Science and Engineering from 2016 to 2018.
He was also an international planning officer from 2002 to 2017 at the International Office, where he committed to every aspect of the international affairs in Tokyo Tech.
His research areas are wireless communications, radio wave propagation and the applied radio measurements, as well as the ICT applications for international development.
He is currently the chief advisor of JICA project entitled "Project for Strengthening Engineering Education and Research for Industrial Development in Cambodia."

Dr. Tomohiro FUJITA (speaker of Session 2),
Founder & CEO of Chitose Group/(Member of Bioeconomy Strategy Council, CABINET SECRETARIAT)

Mr. Hong Kok CHEA (speaker of Session 2),
**Director of Macroeconomic and Fiscal Policy Department, Secretariat,
Entrepreneurship Development Funds, the Ministry of Economy and Finance**

Day 1 Closing Remark

Closing Remark

Japanese Speaker

Dr. Kazuko MATSUMOTO, Executive Director, Honda Foundation

Kazuko Matsumoto was born in Tokyo, Japan. She was educated at Department of Chemistry, the University of Tokyo for B. S. in 1972, M. S. in 1974, and PhD in 1977. She joined the same department as research associate in 1977, then moved in 1984 to Department of Chemistry, Waseda University in Tokyo as associate professor, where she was promoted to a full professor in 1989. During these years, she spent also several short periods as visiting scholar or visiting professor at MIT, USA, Institute of Molecular Science, Japan, and several major universities in Japan. During 2002–2005 she served as a member of The Council of Science and Technology Policy (Cabinet Office of Japanese Government). Her major research area is metal coordination chemistry and inorganic analytical chemistry, more specifically; (i) development of lanthanide complexes as luminescent bio-labels for time-resolved detection in immunoassay and imaging. (ii) linear Pt chain complexes having Pt-Pt-Pt multiple bonds as spin and electro-conducting materials. Since 2012, she has been a director of Honda Foundation and contributing for the promotion of young scientists and engineers in Asian countries, and also for honoring scientific and engineering excellence established by pioneering researchers in the world.

Day 2

Opening Remark and Panel Discussion1 Moderator

Dr. Mitsunobu KANO,

Executive Director of HOF/Vice Executive Director and Professor, Okayama University/ (Science and Technology Co-Advisor to the Minister for Foreign Affairs)

Dr. Kano has experienced clinical medicine, research in medical engineering, and public services including academy activities and governmental commitments. The public services led him to efforts in developing education for general sciences, including those for the SDGs into university administration. Dr. Kano graduated from and started research activity in the University of Tokyo, did his clinical residency in St. Luke's International Hospital, and is now Professor and Vice Executive Director in Okayama University. As the latter role he led the university to be awarded by the Japanese government for achieving the SDGs in 2017, and now serves as Chair of SDGs Initiatives Planning Committee. Meanwhile he led to establish a new interdisciplinary graduate school focusing on the health care systems in the university. Dr. Kano was the former Deputy Chair of the Young Academy Japan, and a former Executive Committee member of the Global Young Academy (GYA). Dr. Kano has been commissioned as the Science and Technology Co-Adviser to the Minister of Foreign Affairs of Japan since 2019.

Panel Discussion 1 Panelists

Dr. Akinori MORIMOTO (following Session 1 of Day 1),
Professor, Waseda University, Faculty of Science and Engineering/School of Creative Science and Engineering

Dr. Shizuo IWATA (following Session 1 of Day 1), **Chairman, ALMEC Corporation**

Mr. Thanh Yen LE, **Y-E-S Vietnam 2015 Awardee**

Mr. Satyam MOHLA, **Y-E-S India 2017 Awardee**

Dr. Monorom RITH, **Y-E-S Cambodia 2012 Awardee**

Mrs. Thipphamala MANIVONG, **Y-E-S Laos 2009 Awardee**

Ms. Suu Malar WIN, **Y-E-S Myanmar 2016 Awardee**

Mr. Mony SOEURN, **Student Year 4, Department of IT Engineering, RUPP**

Mr. KimAng KHEANG, **Graduated Student 2019 from Department of IT Engineering, RUPP**

Ms. Chhengkeang LY, **Student Year 3, Department of IT Engineering, RUPP**

Mr. Kimhong SAM, **Student Year 4, Department of Telecommunication & Electronic Engineering, RUPP**

Ms. Channtha SUM, **Student Year 4, Department of Tourism, RUPP**

Ms. Kakruna OUK, **Graduated Student 2019, Department of Bio-Engineering, RUPP**

Ms. Somethea TANN, **Student Year 4, Department of Media & Communication, RUPP**

Panel Discussion 2 Moderator

Dr. Nobuko KAYASHIMA,
Senior Vice President of Japan International Cooperation Agency (JICA)/ Honda Foundation International Committee Member

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.

Panel Discussion 2 Panelists

Dr. Nguonly TAING,
Executive Director, Techo Startup Center, Ministry of Economy and Finance, Cambodia

Nguonly Taing has been recently appointed as an executive director of Techo Startup Center, which is a government-funded startup accelerator under the innovation arm of the Ministry of Economy and Finance. He has more than 15 years of working experiences in software industries. Since 2009, he has been also a visiting lecturer on Distributed Systems and Machine Learning at Royal University of Phnom Penh, Cambodia.
He received his M.Sc. in ICT from Waseda University, Japan and Ph.D. in Computer Science from the Dresden University of Technology, Germany. His research areas are run-time variability, anticipated adaptation, unanticipated adaptation, the programming model for IoT and software evolution. He is especially interested in applying the research and experimental development to explore the source of innovation for startups.

Mr. Kei IINUMA (following Session 2 of Day 1), **Incubation and Investment Manager from KSP, Inc.**

Dr. Junichi TAKADA (following Wrap-Up Panel Discussion of Day 1),
Professor, Tokyo Institute of Technology, Vice President for International Affairs

Dr. Ngoc Do Quyen CHAU, Y-E-S Vietnam 2011 Awardee

Mr. Sai Uttej KODURI, Y-E-S India 2018 Awardee

Ms. Sothearath SOK, Y-E-S Cambodia 2018 Awardee

Mr. Leego VANH, Y-E-S Laos 2012 Awardee

Ms. Pwint Phyu Thant, Y-E-S Myanmar 2017 Awardee

Ms. Lyheng PHAN, Student Year 3, Department of IT Engineering, RUPP

Ms. Darinah Pich LEANG, Student Year 4, Department of Tourism, RUPP

Ms. Monysolida SAN, Student Year 4, Department of Bio-Engineering, RUPP

Ms. Kakruna OUK, Graduated Student 2019, Department of Bio-Engineering, RUPP

Ms. Somethea TANN, Student Year 4, Department of Media & Communication, RUPP

Conclusion Speeches

Mr. Akira KOJIMA,
Director of HOF/President of Center for International Economic Collaboration (CIEC)

Trustee and visiting Professor of GRIPS (National Graduate, Institute for Policy Studies) and Councilor of JCER (Japan Center for Economic Research)
■ Other Present Positions and Activity:
Member of the Trilateral Commission
Chairman of WTC (World Trade Center) Tokyo
Vice Chairman of Japan-German Center (Berlin)
Councilor of Aspen Institute, Japan
Director of Honda Foundation (Chairman of International Committee)
Councilor of IIMA (Institute for International Monetary Affairs)
Director of IIPS (Institute for International Policy Studies)
Member of the Advisory Committee of JETRO (Japan External Trade Organization)
Visiting Professor of Ritsumeikan University (Graduate School of Management)
■ Professional Experiences:
1997–2000 Chief Editorialist and Senior Managing Director of NIKKEI (The Nihon Keizai Shimbun Newspaper)
1999–2008 Professor of Keio University (Graduate School of Department of Commerce)
2004–2008 Chairman of JCER (Japan Center for Economic Research)
2004–2007 Professor of Harbin Institute of Technology (China)
2002–2007 Advisory Committee member of Graduate School of Public Policy of Tokyo University (GRaSPP)
■ Publications:
A New Development Model for Japan Ⅱ: Selected Essays 2009–2019 (Nikkei Publishing Inc. 2019)
A New Development Model for Japan: Selected Essays 2000–2008 (The Japan Journal Press, 2008)
Choices for Japan (NTT Press, 2008, Chinese language edition was published in 2010).

Dr. Chan Oeurn CHEY (Panelist of Wrap-Up Panel Discussion of Day 1),
Vice Dean, Faculty of Science, RUPP

Dr. Sovann EN, Y-E-S Cambodia 2009 Awardee

Contributors to This Symposium

Akira GOTO,
Professor Emeritus, University of Tokyo,
Former Commissioner, Japan Fair Trade Commission of the Government of Japan,
Councilor, Honda Foundation,

Professor Goto's expertise covers economics of competition policy and economics of innovation. His major works include "Business Groups in a Market Economy," European Economic Review, Vol. 19, No. 1, September 1982, "R&D Capital, Rate of Return on R&D Investment and Spillover of R&D in Japanese Manufacturing Industries," Review of Economics and Statistics, Vol. 71, No. 4, 1989, (with Kazuyuki Suzuki), Competition Policy in a Global Economy, (ed. with W. Comanor and L. Waverman), Routledge, 1996, Innovation in Japan, (ed. with H. Odagiri), Oxford University Press, 1997, "Japan's National Innovation System: Current Status and Problems," Oxford Review of Economic Policy, Vol. 16, No. 2, Summer 2000, "Construction of a Japanese Patent Database and a first look at Japanese patenting activities" (with Kazuyuki Motohashi), Research Policy, Vol. 36, Issue 9, 2007, and "Innovation and Competition Policy," Japanese Economic Review Vol. 60, No. 1 March 2009, "Patent statistics as innovation indicators" with Sadao Nagaoka and Kazuyuki Motohashi, in Handbook of Economics of Innovation (eds.) Bronwyn Hall and Nathan Rosenberg.

He was commended by the Minister of Economy, Trade and Industry and Minister of Education. He received the Order of the Sacred Treasure.

Kunio NAKAJIMA,
Vice President, Honda Foundation

Year of Birth

1941

Education

1965 B.S. Department of Science and Engineering, Tokyo Institute of Technology
1968 Tokyo Institute of Technology, Master Course

Experienced Positions

1968–1999	Director-General for Technology Policy Coordination, Ministry of Economy, Trade and Industry
1999–2000	Managing Director, Japan Chemical Innovation and Inspection Institute
2000–2004	Professor, Tokyo Institute of Technology
2004–2007	Professor, National Graduate Institute for Policy Studies
2007–2012	President, Japan Chemical Innovation and Inspection Institute
2011–Present	Adviser, Japan Bioindustry Association
2012–Present	Adviser, Japan Chemical Innovation and Inspection Institute

Research Areas

Policy for Industrial Technology

Shiro SAITO,
Director, Honda Foundation

Year of Birth

1948

Education

Graduate from Keio University

Experienced Positions

The foreign correspondent of NIKKEI Newspaper at NEW YORK
The director of the economic news department of NIKKEI Newspaper
The editor in chief of NIKKEI Newspaper
The executive director of NIKKEI Newspaper
The chairman of the Japan Center for Economic Research
The chairman of the Japan Press Club

Honors/Awards/Fellowships

The award of the Japan Newspaper Publisher & Editor Association
The award of the Minister of Education, Culture, Sports, Science and Technology at Nigenkai Art Society

Research Areas

Macro Economy/Financial Market

Special Thanks to:

Dr. Khim Leang and Dr. Srun Sovila of Royal University of Phnom Penh (RUPP) for the great support in hosting the Cambodia International Symposium

Y-E-S Attendees

What is Honda Y-E-S Program?

Honda Foundation started the Honda Y-E-S (Young Engineer and Scientist's) Award program to foster future leaders of science and technology fields in 2006. It is implemented in Vietnam, India, Cambodia, Lao PDR and Myanmar, and Bangladesh from 2019. It is distinctive in that it is not restricted to tuition but may be used for a broad range of activities. Another very unique characteristic of the system is that its details are matched to the receiving country's needs and circumstances. Furthermore, the awardees can receive an additional grant, Honda Y-E-S Award Plus/Honda Y-E-S Plus Expansion, if they continue their study and training within certain period after the receipt of the Honda Y-E-S Award, either via master's, doctoral, or study abroad programs in Japanese universities, or via internship programs in Japanese research organizations or private companies. We also hold the Honda Y-E-S Forum to engage young scientists and engineers from Japan and other Asian countries, including the Honda Y-E-S awardees, in discussion with experts in various fields, on issues in modern society examined from the perspective of young scientists and engineers.

Vietnam

1. Y-E-S Award Year 2. Current Affiliation 3. Program to appear

Ngoc Do Quyen CHAU

1. 2011 Y-E-S Awardee
2. Lecturer, Ho Chi Minh City University of Technology (HCMUT)
3. Panel Discussion 2

Thanh Yen LE

1. 2015 Y-E-S Awardee
2. under, Chief Technology Officer of startup Dench labs
3. Panel Discussion 1

India

1. Y-E-S Award Year 2. Current Affiliation 3. Program to appear

Sai Uttej KODURI

1. 2018 Y-E-S Awardee
2. 4th year undergraduate student, B. Tech in Engineering Design + M. Tech in Automobile Engineering, IIT Madras
3. Panel Discussion 2

Piyush NANDA

1. 2017 Y-E-S Awardee
2. 5 Year Student (Dual Degree in Biotechnology and Biochemical Engineering), IIT Kharagpur

Satyam MOHL

1. 2017 Y-E-S Awardee
2. Electrical Engineering, IIT Bombay
3. Panel Discussion 1

Cambodia

1. Y-E-S Award Year 2. Current Affiliation 3. Program to appear

Monorom RITH

1. 2012 Y-E-S Awardee
2. Ph.D. Student, De La Salle University, Manila
3. Panel Discussion 1

Sothearath SOK

1. 2018 Y-E-S Awardee
2. Self-employed
3. Panel Discussion 2

Sovann EN

1. 2009 Y-E-S Awardee
2. Computer vision research scientist, Stradigi AI Inc.
3. Conclusion Speech

Lao PDR

1. Y-E-S Award Year 2. Current Affiliation 3. Program to appear

Thipphamala MANIVONG

1. 2009 Y-E-S Awardee
2. Lecturer, Mining engineering dept. faculty of Engineering, NUOL
3. Panel Discussion 1

Khandala KHAMPHILA

1. 2009 Y-E-S Awardee
2. Lecturer, Champasak University

Leego VANH

1. 2012 Y-E-S Awardee
2. Tourism Advertisement and Promotion Unit—Information, Culture and Tourism Department, Saysomeboun Village, Luang Namtha Province
3. Panel Discussion 2

Myanmar

1. Y-E-S Award Year 2. Current Affiliation 3. Program to appear

Phyoe Wae HEIN

1. 2018 Y-E-S Awardee
2. Final Year, Department of Civil Engineering, Yangon Technological University

Suu Malar WIN

1. 2016 Y-E-S Awardee
2. Master Degree Student at Mandalay Technological University
3. Panel Discussion 1

Pwint Phyu THANT

1. 2017 Y-E-S Awardee
2. Civil Engineer (Formwork), La Pyi Wun Construction Co., Ltd.
3. Panel Discussion 2

DAY 1

Welcome Session

Mr. Hiroto ISHIDA, President, Honda Foundation

H.E. Dr. Chealy CHET, Rector of RUPP

Mr. Hiroto ISHIDA
President, Honda Foundation

Welcome Session

Introduction of Honda Foundation and the Concept of "Ecotechonology"

Soichiro Honda
and
Ecotechnology

Hiroto Ishida
President, Honda Foundation

HONDA FOUNDATION
公益財団法人 本田財団

Excellencies, ladies and gentlemen: I'd like to extend my greatest gratitude for all the participants here as a responsible person of one of the host organizations of this symposium, and I'd like to welcome all the participants here in this glamorous and well-prepared space. Now I'd like to introduce the activities of Honda Foundation and, first, of its father, Soichiro Honda. First of all, Soichiro Honda's biggest "son" is Honda Motor Company.

Soichiro Honda

- Great man of Innovation
- Producer of Motorcycle, Power Product and Car.
- His Dream: Airplane
- Father of Honda Foundation

Honda Motor is one of the leading companies in automobile production in the world, manufacturing cars, motorcycles, power products and jet planes. Soichiro Honda is a great person of innovation and airplane production. It was a dream of Soichiro Honda and his dream was realized by the efforts of his successors.

He is the father of Honda Foundation. That is Soichiro Honda and his younger brother, Benjiro Honda.

Honda Foundation (HOF)
Established in 1977
by Soichiro Honda and
Benjiro Honda
(Soichiro's Younger Brother)

Purpose of HOF:
To promote the concept of Ecotechnology

Then Honda Foundation was established by the Honda brothers, Soichiro and Benjiro, in 1977. The reason why they created the Foundation is to promote the concept of "ecotechnologies."

Concept of "Ecotechnology"
Technology is not merely for efficiency or profit, but should be created and used in harmony with nature and social environment.

SDGs
Sustainable Development Goals
UN and many countries are making efforts for these 17 goals.

This concept is based on Soichiro's very strong belief that technology is not merely for efficiency or profit but should be created and used in harmony with nature and the social environment. Ecotechnology is thus a very wide concept and it includes various fields of technology for human happiness. So ecotechnology is the same idea as the SDGs stipulated by the United Nations and many countries.

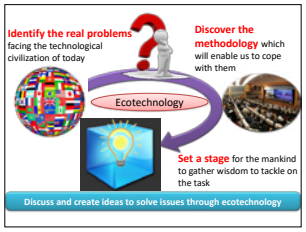
Activities of HOF

1. To host International Symposia
2. To present the Honda Prize (since 1980)
3. To host Colloquia
4. To present Y-E-S Award (since 2006), etc.

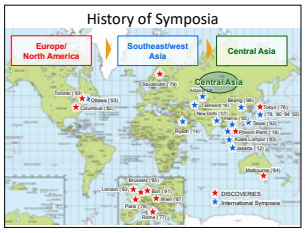
For this purpose Honda Foundation is carrying out four activities. These are: 1) hosting international symposia; 2) awarding the Honda Prize; 3) hosting colloquia; and 4) presenting the Y-E-S Awards.

International Symposia

- In Europe and North America, recently in Asian Countries
- To discuss various issues by gathering wisdom, aiming at promotion of Ecotechnology



The first one is to hold international symposia just like this one in various countries. Since the Foundation was established, it has continued to provide international symposia bringing experts from various fields together to frankly discuss beyond the capacity of their relevant expertise, in order to define the issues caused by technological development and economic growth and to discover methodologies on ecotechnology for resolving these issues.



That is a map. At the early stages, symposia were held in Europe and North America, but recently we have been holding them in Asian countries as well.

Purpose/Objectives of Symposia

- Provide a venue for discussing issues of the current society adversely caused by technological development and economic growth
- Contribute to search for possible solutions to such issues through promoting ecotechnology that brings technological development in harmony with natural and human environments
- Contribute to Cambodia-Japan relationship in science and technology field

Honda Foundation thus hopes that we can have a lively discussion today so that the Cambodia-Japan relationship in the scientific and technological fields will become much stronger through this symposium, contributing to a much more prosperous future for both countries and the world.

Honda Prize:

- Started in 1980
- To reward prominent scientists and technologists on the contribution in light of Ecotechnology
- Up to 2019: 43 persons received

The second one is to award the Honda Prize to scientists who make remarkable contributions to the concept of ecotechnology. It started in 1980 and 43 great scientists and engineers have received the prize up to this year.

This year's Honda Prize laureate is Professor Geoffrey Hinton of the University of Toronto in Canada, who is a world-renowned specialist in artificial intelligence. He is giving us a lecture. And this is a picture of a special symposium that was organized on the occasion of the 35th Honda Prize award ceremony.

Colloquia:

- To invite guest lecturers quarterly for intellectual exchange of various opinions on Ecotenology

The third one is to set up colloquia in Tokyo inviting great lecturers four times a year for the purpose of stimulating intellectual exchange of opinions on ecotechnologies.

This is a picture of a colloquium that was held in March of this year.

Y-E-S Award

- Honda Young Engineer and Scientist's Award
- Grants to young students
- To support future scientific leaders in Vietnam, India, Cambodia, Laos and Myanmar.

The last one is the awarding of grants called the Y-E-S Awards. "Y-E-S Awards" means the "Young Engineers and Scientists" Award, to young Asian students who are going to be leading scientists or engineers in each country. Now, this awarding system is operated in Vietnam, India, Cambodia, Laos, Myanmar and from this year Bangladesh. Some of the recipients are invited to Japanese universities to participate in academic meetings. Up to last year 362 students have received this award. Many years ago Soichiro Honda supported many promising Japanese students to study science and engineering, and this supporting system had a strong influence on the development of Japanese science and industry.

This is a picture of a presentation ceremony in Vietnam.

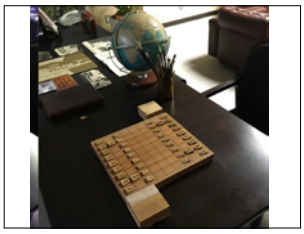
This one shows ceremonies in India and Cambodia.

This one shows presentation ceremonies in Laos and Myanmar. In an effort to coordinate the international symposia with the Y-E-S Award program, we tried to extend this symposium to two days for the first time this year. The session of first day, which means today, will center on the discussion by researchers and specialists. The second day is expected to spotlight young researchers and students, inviting 15 past Y-E-S awardees as representatives of five Y-E-S countries. We set opportunities for discussion among today's speakers, invited awardees and talented Cambodian undergraduate students. Now, Y-E-S members who are here today, please stand up here. Please stand up, Y-E-S students. Thank you very much for joining us today.

Soichiro Honda

- He had very fine human touch with various episodes.
- He was fond of playing Shogi (Japanese Chess).

Now I'd like to come back to Soichiro Honda. Soichiro Honda was a truly great entrepreneur but he was also a human-touch person. He had various interesting episodes which are described in his book entitled *Dream Into Action*.



He loved playing shogi. This is a shogi board, a kind of Japanese chess.

I'm not sure whether Soichiro was a good shogi player or not, but he enjoyed it very much, and his playing board, as you can see, was not an expensive one. Some people have very thick and expensive shogi boards, but the board Soichiro loved was inexpensive and quite common. This board is an expensive one but it doesn't belong to him. He liked very common shogi boards.

Painting

- He loved painting.
- Next picture is White Mt. Fuji painted by Soichiro Honda.

Mt. Fuji

- Many Japanese Artists painted Mt. Fuji.
- Red Fuji by Hokusai Katsushika (1760~1849) is very famous.

He was fond of painting also. He painted this portrait of Mt. Fuji. Historically speaking, many Japanese artists painted Mt. Fuji. The most famous painter of Mt. Fuji was Hokusai Katsushika, who painted the *Thirty-six Scenes of Mt. Fuji*, which actually consists of 46 scenes of Mt. Fuji. He lived at the end of the Edo era. These paintings are *Red Mt. Fuji*, *Black Mt. Fuji* and *Wave and Mt. Fuji*. All Japanese respect the very skillful and impressive pictures drawn by Hokusai. This *Wave and Mt. Fuji* seems to show the view of Mt. Fuji from Tokyo Bay, very near Tokyo.

Environmental Efforts

- Now Mt. Fuji can be seen clearly from Tokyo just as Era of Hokusai by reducing air pollution by the environmental efforts.

Hope of HOF

- HOF has made efforts for the success of today's symposium, and hopes that Ecotechnology will bring about and keep clean air, clean water, clean soil and clean globe.

Following reductions in environmental pollution from environmental endeavors, now Mt. Fuji can be seen clearly from Tokyo, just as in the era of Hokusai, many years ago. Honda Foundation has many thoughts aiming at the success of today's symposium. I sincerely hope that Ecotechnology will bring about and keep clean air, clean water, clean soil, clean goals and human happiness.

Thank you

HOF

I sincerely hope that fruitful and successful conclusions and future prospects will be brought about by today's and tomorrow's symposium. Thank you very much for listening. Thank you very much.

H.E. Dr. Chealy CHET

Rector of RUPP

Welcome Session

First of all on behalf of the Royal University of Phnom Penh (RUPP) let me pay my respects to His Excellency Dr. Touch Visalsok, Secretary of State and Representative of the Ministry of Education, Youth and Sport; His Excellency Dr. Chhem Kieth Rethy, Minister attached to the Prime Minister; His Excellency Dr. Mey Kalyan, Senior Advisor to the Supreme National Economic Council and Chair of the Board of Trustees of RUPP; Mr. Hiroto Ishida, President of Honda Foundation; Mr. Akira Kojima, Director and Chairman of the International Committee, Honda Foundation; national and international guests, ladies and gentlemen: Let me officially welcome you to this symposium, and as a co-organizer with Honda Foundation, RUPP is proud to host this kind of event. It is a forum for our young scientists to get more knowledge and share that knowledge with their colleagues. This symposium has three main purposes: One is to provide a venue to discuss issues in current society adversely caused by technological development and economic growth. The second purpose is to contribute to research for possible solutions to such issues through promoting technology that brings technological development in harmony with the natural and human environment. The last purpose is to contribute to the Cambodia-Japan relationship in the scientific and technological fields. As you may know, RUPP is the home of the Cambodia-Japan Cooperation Center. We call it CJCC. It is like a second embassy of Japan. Those who want to know about Japanese culture, education and anything can come here—except visas, those we cannot provide! So RUPP thanks Honda Foundation for choosing us as a partner for this symposium. I think that this symposium is important not only for our faculty members in the field of science but also for our students—not only students from RUPP but also students from other universities in Cambodia, especially in Phnom Penh, as I know that there are some students from the Royal University of Agriculture, from the Institute of Technology of Cambodia and from other institutions of higher education in and around Phnom Penh who are also joining in this event. Again, I will not take more time for this, but on behalf of RUPP we welcome you all, Japanese friends who choose us to be their partner and our guests from other organizations, especially His Excellency the Minister of Education. We thank you for sharing your time with us and I hope His Excellency will give many full opening remarks to start our symposium officially. Thank you very much.

DAY 1

Opening Remarks

H.E. Dr. Visalsok TOUCH, Secretary of State, Ministry of Education, Youth and Sport

H.E. Mr. Masahiro MIKAMI, Ambassador Extraordinary and Plenipotentiary of Japan to the Kingdom of Cambodia

H.E. Dr. Visalsok TOUCH

Secretary of State, Ministry of Education, Youth and Sport

Opening Remarks

A very good morning, Excellencies, ladies and gentlemen. H.E. Dr. Chhem Rethy, Minister attached to the Prime Minister; H.E. Dr. Mey Kalyan, Senior Advisor, Supreme National Economic Council, Royal Government of Cambodia; Mr. Hiroto Ishida, President, Honda Foundation; Mr. Akira Kojima, Director and Chairman of the International Committee, Honda Foundation; Excellencies, ladies and gentlemen: On behalf of Excellency Academician Dr. Hang Chuon Naron, Minister of Education, Youth and Sport, and on behalf of the Ministry and all leaders, we express our appreciation to Honda Foundation for supporting such a useful event. Actually, just seeing the theme of the international symposium you can see that this is the first time, to the best of my knowledge, that this theme has been addressed in Cambodia, to talk about the linkages between government, universities and industry. This is what the government is trying to promote because industrial development in Cambodia is still limited and we are trying to promote research. That's why we are now organizing in the STEM Building. This is, I think, the outcome of the government's focus, probably the first building in Cambodia. The government has put a lot of effort into building science, technology and engineering in Cambodia. This partnership is very important. If you study chemistry or biology, the partnership is considered as a triple helix to promote science and technology. Without this partnership I think science and technology innovation will not happen. However, to be a partner I think universities have to be strong as well, to attract attention from industry, otherwise industry will not consider us as a partner. So the government also plays an important role in creating policy and providing the budget to create this kind of forum. I think university itself has to build the capacity in order to serve the needs of industry and infrastructure. Facilities are the main challenge at the moment for many universities in Cambodia. Luckily I think RUPP already has the infrastructure, this STEM Building, but what you need in the future are facilities. And also I think that RUPP has a number of qualified researchers already. So we have the car, we have the engine, but what we need is the petroleum to push it forward. So I hope Honda Foundation will consider helping RUPP as well as other higher educational institutions to promote research and development and innovation in Cambodia. Through either, I think from what Mr. Ishida mentioned, scholarships and research awards, whether it's undergraduate or graduate, but it will be helpful. It encourages young people in Cambodia to study science and technology. I would like to say to you that Cambodian young people are very interested in science and technology. If you see the trends in other Asian countries, the number of students enrolling in science and technology is decreasing. In Malaysia, for example, it's less than 30% now. I think Thailand also. But Cambodia is growing in the reverse trend. It's going up. Now more than 35% of our students are enrolling in science and technology. The evidence is clear. RUPP is a hub for science and technology. Let's say the number of students enrolled in chemistry is, as far as I know, 400, the number enrolled in physics is 400 this year. When combined with mathematics and computer science, together half of RUPP students are enrolled in science- and technology-related subjects. So we have potential for science and technology. Our young people, our students, are very interested in science and technology. What we need to do is encourage them to become qualified and use their knowledge for the betterment of Cambodia. So I hope this topic and this symposium will encourage more researchers to do research especially related to ecotechnology or green technology. But this is a challenge. As a researcher you want to do something for economic growth, useful, but with consideration of the environment. For example, you want to produce crops of vegetables and fruit that are safe and productive, without using chemical fertilizer, but it's hard because insects are clever. Before insects never ate certain leaves such as eucalyptus leaves, but now you see that insects eat it all. I think this is the challenge for researchers. They want to do something for economic growth but with conservation of the environment. I think we need a joint effort between government, industry and academia. Academia, government and industry have to work together for the betterment of the nation, the region and the globe. So again I would like to express my gratitude to Honda Foundation for supporting this symposium and RUPP, H.E. the Rector who is very interested in science and technology, and also the staff of RUPP for co-hosting this event. I wish the workshops of the international symposium success and now we will open up. Thank you very much.

H.E. Mr. Masahiro MIKAMI
Ambassador Extraordinary and Plenipotentiary of Japan to the Kingdom of Cambodia

Opening Remarks

Mr. Ishida Hiroto, President, the Honda Foundation; H.E. Dr. Chet Chealy, Rector of the Royal University of Phnom Penh; H.E. Dr. Rethy Chhem, Minister attached to the Prime Minister; H.E. Dr. Mey Kalyan, Chairman of the Board of Directors of the Royal University of Phnom Penh; distinguished speakers; ladies and gentlemen: First of all, I would like to express my sincere congratulations to all those involved in organizing this International Symposium, which is being co-sponsored by Honda Foundation and the Royal University of Phnom Penh. I am pleased to have this opportunity to speak to researchers from inside and outside the country, as well as to teachers and students from the Royal University of Phnom Penh.

As you may know, Mr. Honda Soichiro, founder of Honda Foundation, completed his compulsory primary education and went on to study mechanics at a small automobile repair shop in the 1920s. Following this, he started his own small motorcycle manufacturing company with only 20 employees. His outstanding talent and untiring efforts led to success and he quickly expanded his company into a world-renowned enterprise that is recognized as a leader in the automotive industry sector. His achievements have made him a figure the Japanese are very proud of.

Today, Honda Foundation, which was established to serve Mr. Honda's ideal of "contributing towards the creation of a truly humane civilization," has turned its focus on Cambodia and is holding this international symposium here. I understand the aim of the Symposium is to find ways to solve a variety of problems that the modern society is facing and, through multidisciplinary and all-party discussion, seek to find ecotechnologies that will address the identified challenges.

Seventeen years ago, when I worked at the Embassy of Japan in Thailand, I visited Phnom Penh on a business trip. Phnom Penh looked very different to the way it looks now. This time, since I came here three months ago, I have been impressed strongly by the remarkable economic development that has been achieved in the seventeen years. I admire the tremendous efforts of the Cambodian people who have made this achievement. Now, the Royal Government of Cambodia has set a goal of joining the ranks of the high and middle income countries by 2030, and is working on various political, economic and social reforms to achieve that goal.

I was born in 1962 in Japan, and looking at the current landscape of Cambodia. It reminds me of that of my childhood in Japan between 1960s and 1970s. In retrospect, based on the Prime Minister Ikeda's policy of the so-called "Income Doubling Plan" in the 1960s, Japan was recording double-digit high economic growth every year. At that time, it was only around 25 years after the defeat and devastation of Japan in WWII in 1945, and many energetic and industrious young people were supporting the rapid economic growth. Here in Cambodia, 28 years have passed since the 1991 Paris Peace Agreement after the hardship of the civil war. Today's Cambodia, where people are making diligent efforts for the better future despite the remaining poverty, makes me feel that it has something in common with Japan when I was 10 years old after 27 years since the end of WWII.

That said, just like Japan during the high growth period, there are a variety of problems facing the country, in urban areas, especially in Phnom Penh. Poor waste management, worsening traffic congestions, an increasing number of traffic accidents and the worsening environmental pollution are becoming apparent as the population grows and the society becomes more affluent. At the same time, in the countryside, there are still issues, caused by poverty, such as difficulties in ensuring access to education and tackling the illegal logging of forests. These challenges could have a significant and negative impact on the further economic

development of Cambodia. I think that, in Cambodia's effort to solve these problems, the experience of Japan can be a good reference point. And there, education and development of human resources are of utmost importance. The Government of Cambodia is already working to develop high quality human resources in the industrial sector in order to ensure competitiveness with other countries. I understand this is being done through an "Educational Strategic Plan" that puts an emphasis on strengthening the STEM subjects (science, technology, engineering and mathematics).

The Royal University of Phnom Penh was founded in 1960 by the former King, His Majesty King Norodom Sihanouk. Suffering a lot as a result of the civil war but, despite this sad interruption in its history, it has overcome the difficulties presented by the civil war and many talented students have graduated. Current and former students are actively engaged in academic exchanges with universities and research institutes around the world including Japan.

It is therefore timely and appropriate that we are holding this international symposium, on the theme of improving sustainability and quality of life together, at the Royal University of Phnom Penh. The university is recognized as a hub for the development of human resources for the industrial sector and is also acknowledged to be the "brain" of Cambodia. These qualities make it the perfect location for facilitating an exchange of ideas between representatives from industry, government and academia. I am convinced that this symposium will provide an excellent opportunity for intellectual exchanges between Japan and Cambodia that will promote mutual understanding and growth.

New technologies, such as AI, IoT, and 5G are accelerating the integration of the cyberspace with the physical space, and we can create innovation and completely new business models using these technologies. At the same time, these technologies are enabling us to solve many social challenges, such as population and environmental problems. In Japan, we call this technological vision "Society 5.0" and we are expending every effort to make the concept a reality by utilizing every available policy tool.

The more innovative those technologies are, the more worried people can be about them. However, failure to introduce new technologies to the society because of fears about them makes a missed opportunity. In order for the society to fully enjoy the benefits of new technologies, we must adopt a "human-centric" approach. This will involve creating an environment that allows developers to innovate freely and safely and eliminating concerns about technology. This must be done by promoting discussion among stakeholders from academia, the business world, civil society and governments.

Science and technology, created by human knowledge and endeavor, can, and must be, used for the co-existence and prosperity of humanity.

Currently, in order to realize an inclusive society where no-one is left behind, we are accelerating the promotion of our Sustainable Development Goals based on the principle of human security. The Government of Japan is also committing its efforts to policies such as: eliminating additional plastic pollution in our oceans by 2050; providing educational opportunities to 4 million people over the next three years, including implementing policies that empower women in developing countries and promote sustainable development; achieving Universal Health Coverage (UHC) by saving the lives of approximately 1 million AIDS, tuberculosis and malaria sufferers and delivering vaccinations to approximately 1.3 million children.

Japan is already a super-aged society and this brings with it many problems; such as a decrease in the working population and an increase in social security costs. It seems climate change has also increased the frequency of natural disasters in recent years. The Government of Japan will continue to commit every effort to protecting people's lives, property and livelihoods, and to ensuring we have a country where future generations can live with peace of mind.

The Embassy of Japan in Cambodia has been working to support the efforts of the Government of Cambodia on a wide range of projects. These have included the construction of road, port and bridge infrastructures, the improvement of the sewerage systems, the expansion of electricity transmission and distribution capacity, the provision of public buses, the construction of teacher training colleges and the roll out of an education program to spread awareness about environmental issues. We are very gratified to hear that the Japanese contributions to these projects are appreciated by the Cambodian government and many Cambodian people.

In addition, we have recently embarked on a new initiative of "Smart City" in Siem Reap. Here we aim to introduce efficient urban management practices to create a so-called smart city. We will achieve this using the latest science and technology, rather than investing in large-scale infrastructure development.

At today's symposium, the topics of discussion are economic development and cultural harmony, technological innovation and environmental protection. These are all topics which are relevant to both Japan and Cambodia and which we both have to continue to make efforts to address. Last year, Japan and Cambodia celebrated the 65th anniversary of the establishment of diplomatic relations in 1953. Since the 1991 Paris Peace Accords, our two nations have built a close relationship based on trust and cooperation. Since then, Japan has always been alongside Cambodia, supporting the establishment of peace and helping to build the foundations of the nation. We have walked together along the path to peace, reconstruction and development. There are many global issues that affect both our countries and it is extremely important that we tackle these issues and expand the scope of our cooperation by seizing every opportunity to engage in intellectual exchanges and by capitalizing on our strategic partnership. Today, I hope that an active and fruitful exchange of opinions on the topics of, among others, science and technology, economics and education will take place between speakers representing both countries. I sincerely hope that today's symposium will be a significant milestone in the development of bilateral relations between Japan and Cambodia.

Thank you very much for your attention.

DAY 1

Keynote Speeches

H.E. Dr. Kalyan MEY, Senior Advisor, Supreme National Economic Council, Royal Government of Cambodia/Chair of Board of Trustees of RUPP

Dr. Michiharu NAKAMURA, Counsellor to the President of Japan Science and Technology Agency (JST)/Member of UN IATT-STI 10

H.E. Dr. Kalyan MEY
Senior Advisor, Supreme National Economic Council, Royal Government of Cambodia/Chair of Board of Trustees of RUPP

Keynote Speeches

Economic Diversification

Cambodian Efforts to Develop Human Resources and Science and Technology

Please allow me to start with a brief history of Cambodian development. Because all of a sudden you talk about technologies, you do not see the framework. So I would like to give you a brief history of Cambodian development. Very short. Cambodia is one of the oldest countries in Southeast Asia, as evidenced by Angkor Temple, Angkor Wat. If you have time this time, please go to see Angkor Wat. It is only a one-hour flight from here. Then you will see our culture, our civilization, as Mr. Ishida of Honda Foundation mentioned. We talk about civilization, we've had civilization since the eighth century. However, Cambodia's development only started recently, only about 20 years ago. And when we started about 20 years ago, everything started from scratch, from nothing. Why is that? Because of civil war, genocide, destruction. Everything happened to Cambodia. We really only started about 20 years ago, to be honest. So when you look at Cambodia, it's an ASEAN country, but not similar to other countries. Not to say that we are special, but we shoulder those burdens of the past. There's a lot of damage from the destruction of war and so on. Myself, I was fortunate enough to be in Japan at that time, from 1974 to 1988. A long time in Japan. I could not come home because of war. Many of my Cambodian colleagues could not have the chance like me to escape the killing fields. So that is our history in short. But so far, on the bright side, Cambodia has developed quite well and quite smoothly so far. Economic growth has averaged about 7% per year over the past 20 years. You could say that 7% growth for two or three years is fine, but 20 years is a long time. So that allowed us to prosper a lot over the past 20 years. I could summarize by saying that many things in our lives have improved a lot due to one of the main factors, called peace and stability—peace and stability realized by our government. So this is a big factor. Without peace and stability, we could not do anything. I know very well because in the '70s, the destruction, bombing, fighting, every time I kept moving my house, I could not have time for study. So peace and stability, please listen, young people, peace and stability is most important. Without that, no education, no RUPP, nothing. During the Pol Pot time, RUPP was used as a refugee camp. No education, a refugee camp. Okay, that is our history. We still lack so many things compared with other ASEAN countries. That's why I explain to our Japanese delegation that, they tell me they support Singapore, they support Malaysia, they support Hong Kong, I think, "Why don't you support us too? We are poorer than other ASEAN countries. Why do you support Singapore, whose income is higher than Japan's?" We have young people, we have *yaruki*, fighting spirit, we want to prosper and develop our country. Nevertheless, we cannot correct the past. The past is the past, we cannot correct it. As a Buddhist country, and as a Buddhist guy like me, we take these unfortunate events in our past as our destiny. What we can do is improve our future and our tomorrow. We think about our past, but we cannot obsess only about our past, we have to look forward, to tomorrow. In fact, there are so many big tasks in front of us to be done. But wherever we look around, we think that HR, human resources, is the key to many aspects. I understand today's symposium, just this morning—up to this morning I do not understand, but I understand that the heart of it this morning is: Develop technologies, with people, and taking care of the environment. So three parts: technologies, people and nature. Don't destroy nature. So the Honda delegation has come to Cambodia at the right time. I would like to welcome you all to Cambodia. Now it is a bit cold, but many Cambodians say "kol." *Samui*, *samui*. Okay, so the

recitation. I would like to talk a bit about our government policies, on HR and ST. Please allow me to say a few words. "HR" is human resources, "ST" is science and technology. HR and ST are top priorities in our government policies. The biggest policies in the Cambodian government are called "rectangular strategies." Of rectangular strategies, we had one, two and three, and now there are four. In these rectangular strategies, four, human resources and science and technology are the top priority. I observe that this has changed over time. Before we did not pay much attention, but only recently we are paying more and more attention to human resources and science and technology. I see so many increases in government budget toward the Ministry of Education. I cannot tell you how many percent, I cannot remember the number, but a lot of money has been channeled to the Ministry of Education for science and technology. And also thanks to the government, the building you are sitting in now, called the STEM Building, this was also supported by the government recently. We just finished it. Dr. Chealy actually told me, "*Pou pou* (pou means "uncle"), we don't have any decorations yet, it's all blank, because it's new. So please, forgive us for having no decorations, but we go for substance." Other priorities of our government are:

- Infrastructure, meaning roads, water and electricity. I hope there are no blackouts now, but sometimes there are a lot of blackouts in our country still. Blackouts, electricity cut. So still infrastructure is a priority for our government.
- Economic diversification. In fact they asked me to talk about economic diversification. I think that is a narrow topic, so I will expand a bit to include economic history and so on. When we start about 20 years ago, our economy was only agriculture, no industry, a bit of banking and so on. And agriculture was only rice. Rice, rice, rice. And rice, in economic terms, I'm an economist trained in Japan and the value added, the *fukakachi*, is very low. So if we kept pushing for that, we cannot develop our country. So we had to go for high value-added, diversified agriculture, diversified industry and diversified services.
- Another priority is private-sector development, because Cambodians know that the private sector is the key to economic growth. In industry, as I mentioned so far we focus on government-run industry. There are so many government-run industries, but this is labor-intensive. *Rodoshuyakuteki sangyo*. So we have to diversify into others.
- Nevertheless I am glad to mention that I do not forget environmental protection. The climate-change issue is not a problem of Europe, it's not a problem of America, it's our problem. If you look at the news recently, they also broadcast the air quality in each city. High numbers are not good, low numbers are good. So when I look at the map, China is rated 5, high. Singapore is rated 1 or 2, but Cambodia is still at 2 because there isn't much industry here yet. But we have to be careful because industry is coming. We want to have industry but with clean air, so that we can breathe the air in our country.
- Government pays too much attention to governance, how to make the government more efficient. I spoke to a delegation yesterday. We talked about *kanryo*, bureaucracy in Japan. In Japan bureaucracy is viewed as bad. Bureaucrats, bad. But in Cambodia we need this bureaucracy. We need good governance. Now we have only weak governance, not good governance.

I think these are the main pillars our government is focused on. Why? Because we have to provide a better life for our people. If you look behind you, there are so many young people. And great income for our people. Our goal is to become an upper-middle-income country by the 2030 and a high-income country by the 2050s. Those are our targets, everybody is working toward that. Not for technologies as such, but technologies for the people, technologies for the environment. So, as I mentioned, we have to diversify our economy—agriculture, industry and services—and also preserve our environment, our mother. We have only one planet, one Earth, which is this Earth. People talk about going to Mars, going to other planets. Okay, let them dream, but as human beings as far as possible we have to be here. We have to reuse plastic, we have to reuse waste. We've destroyed the environment, so we have to work on this. From our attitude first, then secondly technology. Don't rely only on technology for everything, rely on this (points to head). If you're wrong here, everything will be wrong. So go back to—Sorry, I'm an old-style guy, but thinking is important.

So I can tell you this is the framework of our government policy in the broad outline. We have a thick dossier like this (indicates thickness with fingers) but I am summarizing for you in about half a page the basis of our government policies. Now, in connection with human resources and science and technology, I'd like to share with you an example of efforts done by RUPP, here at this university. RUPP is the only integrated university here in Cambodia. We started around 1960, not the oldest but one of the oldest, with six faculties, including the Faculty of Science and the Faculty of Engineering, so those two arms are science and technology. Our Faculty of Engineering now has three departments: Department of IT, Department of Bioengineering and Department of Electronics and Telecoms. That's what we have now. And we plan to add three more in the future: Department of

Green Architecture, Department of Electrical Engineering and Department of Urban Science. Because urbanization is coming up, more and more people are coming to Phnom Penh, there are a lot of problems, a lot of congestion problems, so these are the departments we are planning to establish at this university. Dr. Chealy is our rector, and our faculty team and board members work hard together to improve RUPP, particularly science and engineering. This is what out course is on. We have three missions. Mission No. 1 is to improve teaching and learning. No. 2 is to promote applied research. No. 3 is to assist and connect with our society. Because Cambodian society is still a poor society, most of our people here are students from all over Cambodia, I think they are coming from poor families and middle-income families, so it is the desire in my heart as chair to serve the young people so that they can have good futures. The way that I can help them is to provide them with good education, good technologies and the right way of thinking as future leaders. As an example, this morning I was happy to bring the delegation to see our Silk Center where we do research on silk. Japan started that 200 years ago, but we just started three years ago. But at least we started. The Silk Center was established with the assistance of the Japanese embassy. And we provided some money for that, and then we got some money from UNDP. So we are trying to collect whatever money we can to establish something that is useful for our society. Also, in our board members for RUPP, we have six members. Maybe my paper here is wrong, I just checked it, but all six members are graduates from Japanese universities. I may be the oldest one, followed by H.E. Mr. Chealy and a few others who graduated from universities in Japan: Me from Kobe, (pointing) from Nagoya, from Waseda, from Kojima-*sensei*'s GRIPS. So we are all serving the society of Cambodia. We are fortunate the government of Japan provided us with opportunities so that we could be leaders for this country to lead it one step further. But at the same time we are fortunate to receive big project assistance from the World Bank, from Sweden to improve STEM education—science, technology, engineering, mathematics and so on. We are working hard with Dr. Chealy and the professors to make this happen in a more efficient way. So we are working on that. Finally I'd like to talk briefly about recent developments, because I was inspired by Nakamura Michiharu-*sensei*, who is counsellor to the president of the Japan Science and Technology Agency. Under the guidance of Deputy Prime Minister Aun Pornmoniroth, he is a powerful person in the government, and also Minister of Economy and Finance, who suggested forming a cluster of science and technology research institutions. In Cambodia we have a few institutions that do research on that. RUPP, this university, is one. ITC, the Institute of Technology of Cambodia next door, is another. And you heard yesterday about Techo Startup Center, meaning the Prime Minister's startup center, located at RUPP as well. And there is another organization called CDRI, Cambodian Development Research Institute, of which H.E. Chhem Rethy was CEO until recently (Now he is promoted to Minister Attached to the Prime Minister). And I am also chairman of that CDRI. So we cluster together to do research on issues, not the issues of America or other developed countries but our issues. We discussed among ourselves, we identified eight issues. We clustered scientists and discussed a wide range of issues with them, such as water issues, political issues, urbanization issues, waste issues, and food safety issues. We work on this cluster, but we don't yet have a science and technology agency like in Japan. So really it is a work in progress that we are doing as an old but young country trying to develop ourselves. So all of this is what I can share with the delegation today. But finally I would like to mention one thing. Honda is the king of motorcycles here, but Toyota is the king of cars here. And when I took the delegation to see the Silk Center, the delegation was surprised to see so many Honda motorcycles in the campus. And honestly I don't know how many hundreds but all Honda Dream, Honda Dream. How many people have a Honda motorcycle, raise your hand? (Several people raise their hands) See, so many people have Hondas. A small promotion for Honda, okay? (Laughter) So with this thought I thank you very much for your attention. Thank you very much.

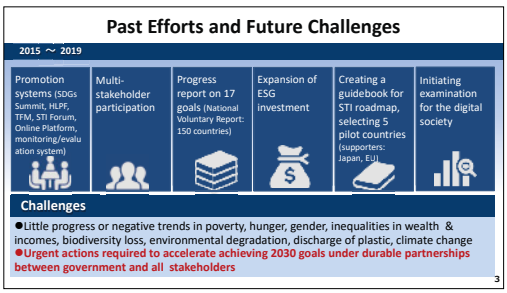
Dr. Michiharu NAKAMURA
Counsellor to the President of Japan Science and Technology Agency (JST)/Member of UN IATT-STI 10

Keynote Speeches

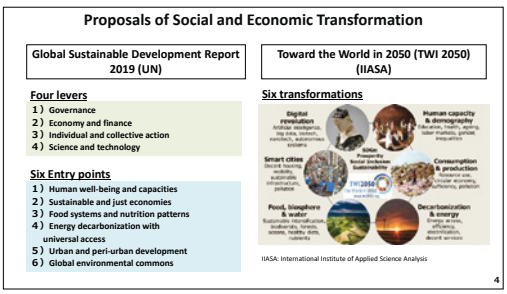
Economic Diversification

Science, Technology and Innovation for a Sustainable and Inclusive Society with Public-Private Partnership

Organizers, distinguished guests and so many others, I am very happy to give you a keynote on science, technology, and innovation (STI) for sustainable and inclusive development. Cambodia is really making great progress in its economy, but also in the level of human lives. In the 1980s, Japan was called "a miracle in Asia." But now I believe you, Cambodia, are making another miracle in Asia.

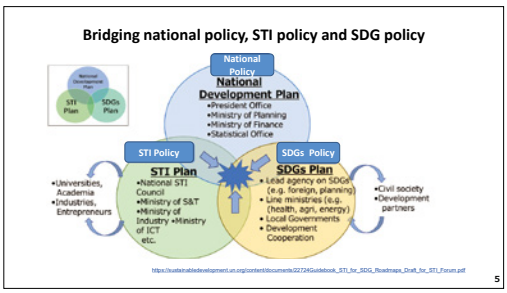


So today I will try to share with you how STI is key to the successful development of a country. In particular, STI for the Sustainable Development Goals (SDG), is the most important action item today to achieve national development and healthy environment. The SDGs were included in Agenda 2030 of the United Nations, which was launched in September 2015. Since then already four years have passed, and I think we have globally made great progress—in particular on the framework for how to promote the SDGs in general, and scientific and technological innovation for the SDGs. We have established promotional systems and encouraged multi-stakeholder participation, and had more than 150 national voluntary progress reviews already. As you can see, the expansion of ESG investments is remarkable worldwide. More than 20% of finances today is ESG-oriented investment. But yet, little progress, or even negative progress, is still observed. Poverty, hunger, gender imbalances, inequality in wealth, climate change, environmental degradation, biodiversity loss, etc. So urgent action is required to accelerate the achievement of the goals by 2030 and form durable partnership within government and all stakeholders. To do so, let's look at a number of very important research studies on how to attack these 17 goals and 169 targets.

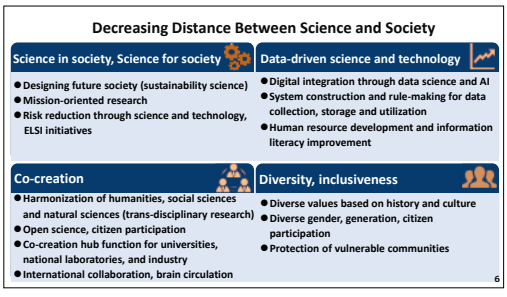


For example, recently the Global Sustainable Development Report of the United Nations claimed that we should use four levers: governance, as just mentioned by H.E. Dr. Mey; economy and finance; individual and collective action; and science and technology. The report recommended six entry points to social and economic transformations. The International Institute of Applied Scientific Analysis (IIASA) also proposed six transformations for the future sustainable society. These are: human capacity and demography; consumption and production; decarbonization and energy; food, biosphere and water; smart cities; and the digital revolution.

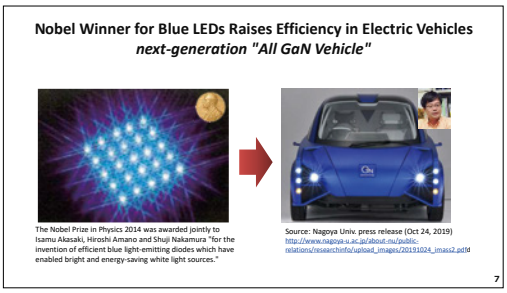
When we first got the 17 goals we were confused. How do we approach them? Which ones should we do the fastest? But today we know the six major transformations necessary. So depending on the region, country or city, we can take some of the transformations as primary targets.

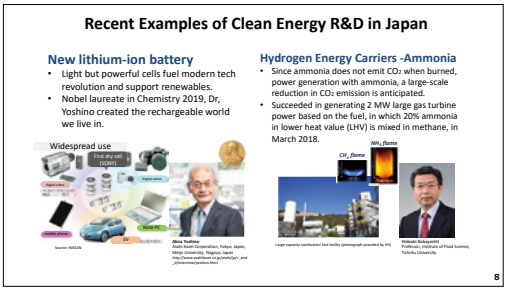


More to the point, we are in the intersection of three policies: national development policy, STI policy and SDG policy. So we have to think about all of them coherently. Although STI is very important, conventional science and technology are not enough to meet our expectations. We have to make them much closer to society.

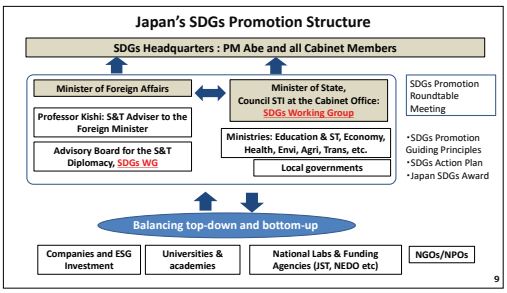


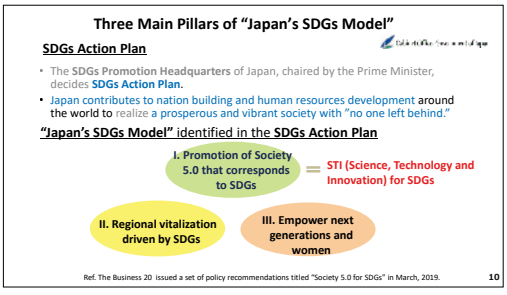
Decreasing the distance between science and society is critical. This is one of the key discussions we have been having. Conclusions are that science in society and science for society are very important, data-driven science and technology are vital for the next decades, co-creation of open science is a new agenda, and diversity and inclusiveness should be taken into account.



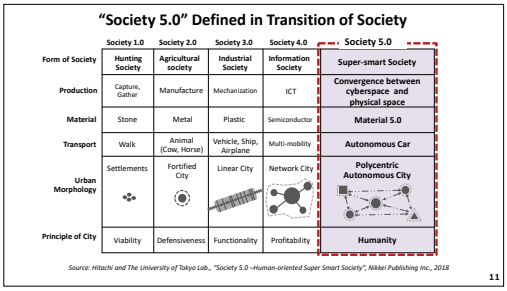


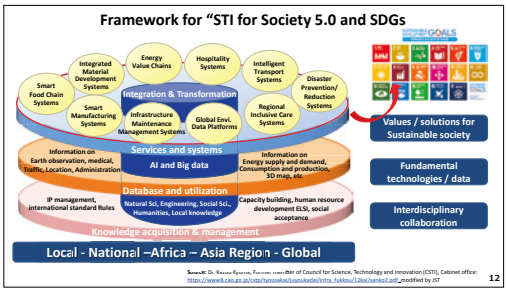
In 2014 three Japanese Nobel laureates were awarded the Nobel Prize in Physics for their achievement of the world's first blue light-emitting diodes. By very advanced, imaginative technology, we can transform society. That is what we are now trying to do. And now Prof. Hiroshi Amano, one of the laureates, is working to use gallium nitride not only for LEDs and lasers but also for electronics such as inverters, and perhaps achieve much more efficient operation of electric cars. Here is a prototype that Nagoya University has recently reported by press release. Yoshino-sensei, a key figure in the development of the lithium-ion battery, was also awarded a Nobel Prize just a couple of days ago in Stockholm. He invented a new type of lithium-ion battery that changed the world. This is how we can enjoy a new society. We can transform society by inventing new technologies. This is why we think frontier research in academia and industry are so important.



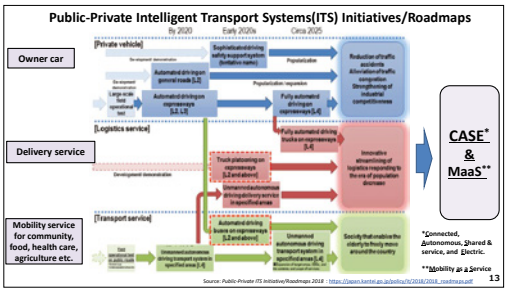


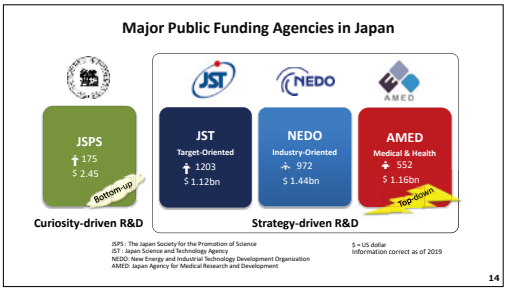
Let me share some cases from Japan. Japan's SDG promotion structure was established in 2016. We've got an SDG headquarters: Prime Minister Abe is its president and all Cabinet members are included in the headquarters, and all the Ministries in Japan are working together to promote the SDGs. Not only government but also companies, ESG investment financial institutions, universities, national labs, funding agencies, NGOs and NPOs—they are all invited to participate in achieving the SDGs. And to do so Japan has SDG promotion roundtable meetings for such multi-stakeholder networks in line with the SDGs.



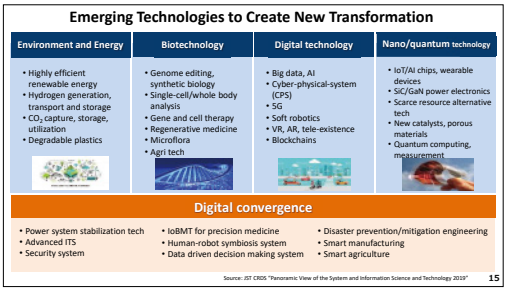


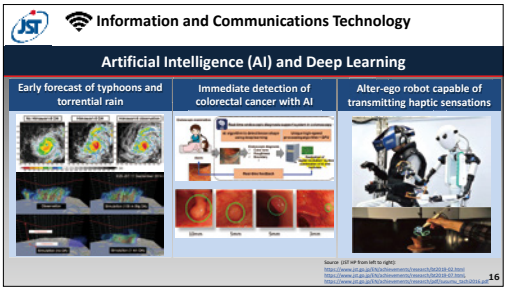
When we speak of the SDGs in Japan we often connect it with "Society 5.0." So this is the framework for STI for Society 5.0 and the SDGs. We have the knowledge acquisition and management layer at the bottom, where we develop new science, invent new technologies and manage knowledge platforms. Database and utilization are the new layer for the digital revolution. The third layer is services and systems using such technologies. We have a number of domains aiming at new transformations. For example, you see the intelligent transport systems (ITS). It's a very fast-moving area. Many stakeholders are involved. How can we manage such a domain? On the ITS, Japan has public-private ITS initiatives, in which the two sides share roadmaps. They revise their roadmaps every year.



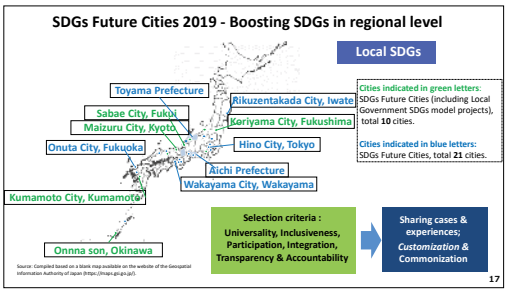


This is the newest version for owned cars, delivery services and mobility services. They draw the pathways, targets, milestones and so on. And every year they revise these charts. Our target is the CASE and MaaS, of course. Such a roadmap provides effective tool for multi-stakeholder's engagement for smart mobility in Society 5.0 and the SDGs. To support science and emerging technological inventions, we have four major funding agencies for curiosity- and strategy-driven R&D.

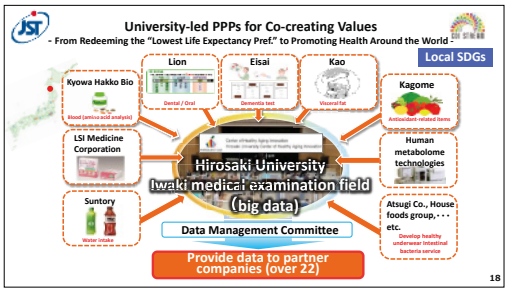




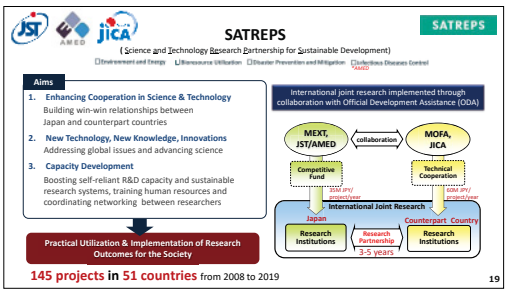
Emerging technologies are very diversified. Every day new technologies emerge; the challenge is how to use these technologies to push society forward. I don't have enough time to go into details, but as an example, using AI and deep learning, we can forecast typhoons and torrential rains early—this is becoming a popular technology in Japan. Immediate detection of cancer with AI is another example. Tele-existence technology is a third.



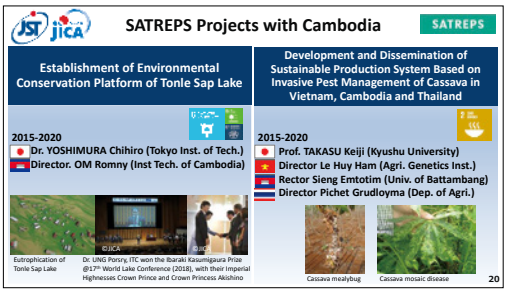
The second point I'd like to mention is local SDGs for the revitalization of local communities. This is a very important theme because everybody comes to Tokyo, Nagoya or Osaka and fewer and fewer people are now living in the rural areas. The gap is expanding. I think this is also the case in Cambodia. How do we activate and revitalize those rural areas? To do so, let's use the SDGs. We call this "local SDGs." The Japanese government has selected "SDGs future cities" in 2018 and 2019, and supports the cities' own initiatives. These are some of the cities selected this year. Under energetic leadership and clear visions of the governors of prefectures or mayors of cities, such local cities are making remarkable transformations.



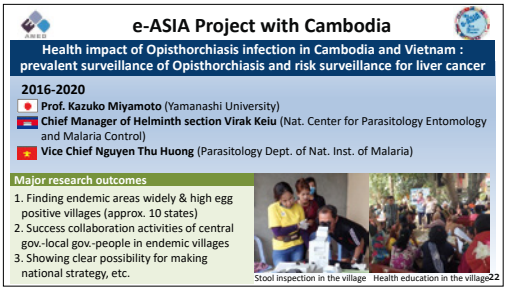
Let me give you an example. Hirosaki is a city in Aomori Prefecture, at the northern end of Honshu. Aomori Prefecture is famous for having the lowest life expectancy in Japan. To improve this situation, they started a large-scale Center of Innovation (COI) study. They use data analysis to determine how residents could optimize their personal medicine. The private sector can use these data to develop new medicines or diagnostic systems. This is one example of how the local SDGs are working.



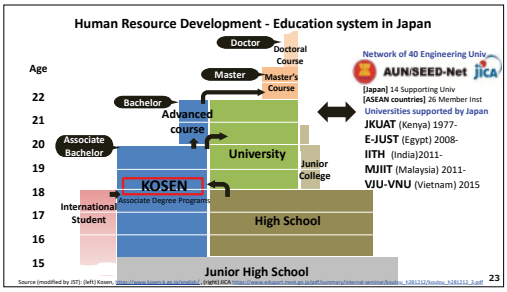
I'd like to touch on the topic of international collaboration. We have a number of programs and tools to do so. SATREPS, the Science and Technology Research Partnership for Sustainable Development, is pretty famous world-wide. Already more than 10 years have passed since it began and we have conducted 145 projects in 51 countries.

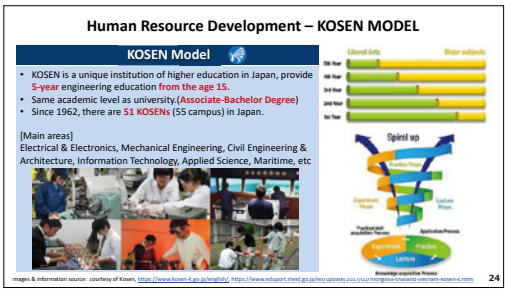


Cambodia is a very important actor in the SATREPS community. We really appreciate your intensive engagement in this project offered by JICA, JST and AMED. These are just a couple of examples of how Cambodia is working in this scheme.

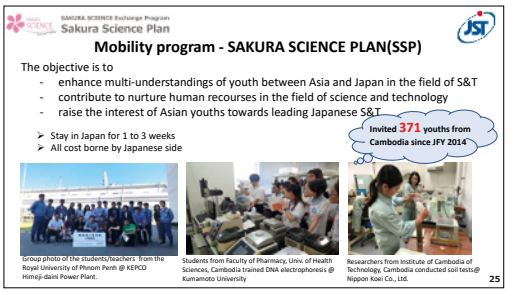


We have also established the e-Asia Joint Research Program, a multilateral cooperation program, so you are also welcome to use this scheme. This is just one example of Cambodia's participation in e-Asia Joint Research Program.





Let me also mention the Japanese educational system. Human capacity development in general education is so critical nowadays. We think we have to improve our educational system from junior high school through high school to university, master's degrees and doctoral degrees. This is a very serious topic in Japan: how to adjust the educational system for such a rapidly changing environment. But anyway, an interesting scheme in addition to the standard educational system is *Kosen*. *Kosen* is a unique, additional educational institute of higher education in Japan. It provides a five-year engineering education from the age of 15, and upon graduation an associate bachelor's degree is awarded to students. The reason why I mentioned this is since Cambodia is going to develop its industries, particularly the manufacturing and civil engineering, you really need engineers and technical experts. The *Kosen* system in Japan has been working very well in this respect.



I have introduced only a few of our activities here—if you're interested to hear more, please contact us. Lastly, let me mention the Sakura Science Plan. We invite young researchers and students to Japan to spend a couple of weeks visiting universities, national laboratories, industries, and so on to know what is happening in Japan and who will be their future partners, expanding their network. This is our aim. Already 371 youths have been invited from Cambodia. This program is really progressing, so please send us more students and more youth. For us in Japan, it's also a good way to understand Cambodia. This is the end of my presentation, so thank you very much for your kind attention.

DAY 1

Session 1

H.E. Dr. Rethy CHHEM, Minister attached to Prime Minister

Dr. Akinori MORIMOTO, Professor, Waseda University, Faculty of Science and Engineering/School of Creative Science and Engineering

Dr. Chanthy LAY, Deputy Head of Research Office, RUPP

Dr. Shizuo IWATA, Chairman, ALMEC Corporation

H.E. Dr. Rethy CHHEM
Minister attached to Prime Minister

Session 1

Inclusive and Sustainable Smart City

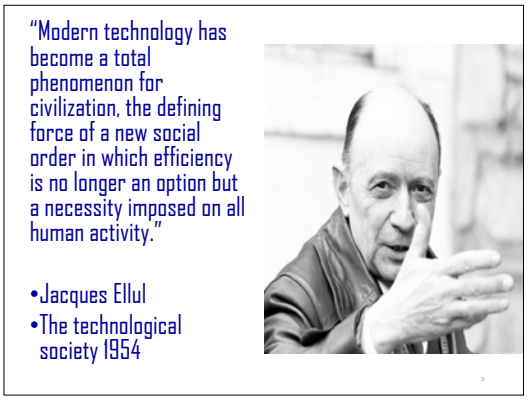
First of all I'd like to take this opportunity to thank RUPP and Dr. Chealy Chet and Dr. Mey Kalyan for inviting me and to welcome our distinguished guests from Japan. Many of you might not know, I worked very closely with the Japanese government and academia for 10 years already when I was at the International Atomic Energy Agency (IAEA). I was sent to Fukushima when the nuclear disaster occurred. Shocked by that time, the Japanese government moved people out of the zone because of safety reasons. My team, we went to the opposite direction. On the shinkansen there were only four or five at that time going there. There is no better way to establish friendship with colleagues than when they are in pain. Until then, using my own time, my free time to teach PhD and master students from Cambodia here by teleconference at the Program of Nuclear Disaster Management at Hiroshima University, at the Institute of Atomic Bomb Disease in Nagasaki, and at Fukushima Medical University. So with this introduction of myself, my deep connection with Japan, we can link the role of technology in bringing good things to people, to society, and sometimes the risk that needs to be managed that are inherent to technology. Certainly nuclear technology, for a medical doctor such as myself, can be used to save lives, curing cancer, but on the other hand it can create disasters like the atomic bombs that were dropped on Hiroshima on the 6th of August 1945 and three days later on Nagasaki. So nuclear technology was a dual-use technology in the 20th century. In the 21st century now we have another technology, cybertechnology, which represents the foundation of smart cities. It's also a dual technology, as we call it. For sociologists of science and technology, it can be very useful, boosting the economy, connecting people and countries, but on the other hand when you say "smart," there's something that in our life is the end of privacy. "Smart city" means more efficient, hopefully better connections, but also a risk for cybercrime, cyberattacks and everything. And when Dr. Chealy invited me I decided to look at the human factor. I know we have distinguished colleagues from Japan who know all about this technology, I'm not here to share that, but I tried to look at the human dimension. At the end of the day the role of science and technology is to serve society. And when I put that title, "Smart cities: Are we ready? The human factor," this morning when I received a brochure of Honda Foundation, I was very delighted to see you used this motto, "Human use of human ideas." So I congratulate you because from the leaders of Honda Foundation the human dimension is still of importance to you.

- "About PNH as garden city:
- There would have been a mixture of density and enough green space for the city to breathe."

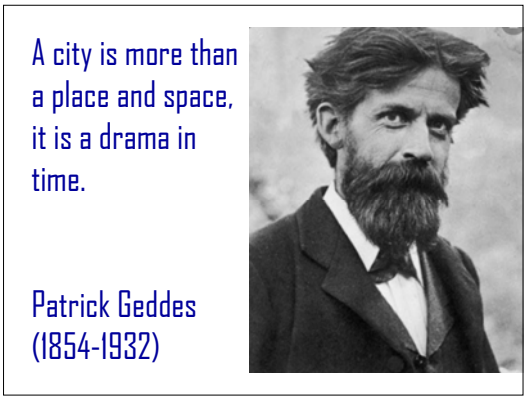
- Van Molyvann
- 1926-2017

So let me start with some quotes. Normally, I don't like to give presentations using PowerPoint, it's the worst tool

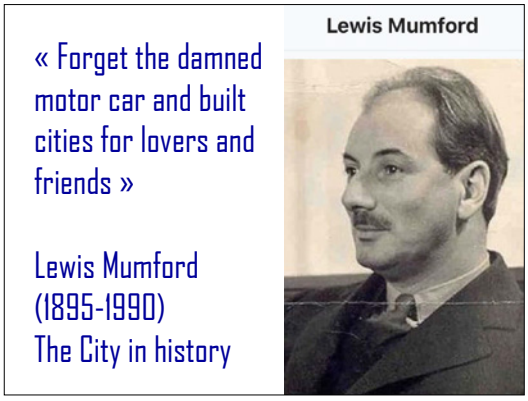
that has been invented for academics because it stops us from looking face-to-face. But because there's a quote, and some of our students do not grasp English properly yet, I took these quotes in English. The first, I'd like to pay tribute to our hero, the first architect and urban planner of Cambodia, who designed this campus, the Royal University of Phnom Penh (RUPP), and to quote him when he talked of Phnom Penh as a garden city. This is in the 1960s, 50 years ago. He said there would have been a mixture of density and enough green space for the city to breathe. Do we have enough green space here in Phnom Penh? I think this time has gone. But maybe this quote will remind us of what to do when we design future cities.



I'll share with you also the thoughts of a few sociologists of science and technology who have thought about the human dimension. And for those of you who are engineers or working in science and technology, you may have heard of the French sociologist of science, Jacques Ellul. And to quote him: "Modern technology has become a total phenomenon for civilization." Like smart cities. "The defining force of a new scientific social order in which efficiency is no longer an option but a necessity imposed on all human activity." This is a very deep thought that was out there for 60 years. It means that he was worried about Technological Society—that's the title of his book. When a technology grows, it comes with benefits and it comes with risks. When Fukushima or other technological disasters happen, we are focusing on trying to fix the issues of technology, to the point that we forget about the human dimension. And I remember when I was at the UN that I was proposing to the government of Japan through the UN to look into the human dimension, my premise for thinking at the time was that a disaster is not only technological, it has a human dimension, and the priority is to address the human need. It was dreadful, they had to leave the city, lost their families and so on. It's not about addressing the technology, and Jacques Ellul understood that very well. Technology is a tool. Use it with wisdom, and when you have a technological problem, don't forget the human dimension.



Talking about cities: Patrick Geddes, he's a Scottish man, he's my hero. I have read many of his books. He started as a biologist then he got training to become an architect and urban planner. There is no better qualification than a biologist to understand the needs of the human body. And to quote him he said, "A city is more than a place and a space. It's a drama in time." What does that mean? It is that the role of the urban planner, since the dawn of civilization when they build a city, the most important is not the buildings, not even the space but an atmosphere, an environment for interaction between the citizens of the society. An interaction is drama. Our life is a drama, made of emotion, using intelligence, using our heart, love, passion, anger, everything is about drama and Patrick Geddes understood very well as a biologist that a city should be a place for spiritual encounter, artistic, aesthetic, scientific, intellectual and political encounter. Therefore a great sphere of drama.



Next one here is Lewis Mumford, an American sociologist. He wrote many books. I have read two of his books again and again. One is called *The City in History*, still very relevant today, and he said, "Forget the damn motor car." He wrote that when Henry Ford put the motor car in the streets of American cities and particularly New York. Those cars kill dozens of children every week, like happens here in Cambodia when you put quickly technology in the hands of people who are not prepared to use those technologies. "Build cities for lovers and friends." Again, very similar to what Geddes has said.

Conditions for smart cities

1. Smart technology
2. Smart citizens
3. Smart governance
4. Smart finance

So with this I'd like to look at what would be the condition for all of us to take advantage of smart cities? Advantage for what? For interaction, and interaction in a very refined way, civilized way. If you have no manners in society, you drop your dustbin in the street, you pass somebody and you don't apologize when you step on their toes, if you are not civilized, a smart city will not make that citizen smarter. And I would tend to think that it is better for you to have wisdom in the mind than to have a smart device in the hand. The technology is actually easy to do. Smart student engineers can build that. But once in the hand, how much wisdom should he have in his mind in order to use this technology in a very civilized way? This smart technology is about, you know, Facebook, the internet, AI, blockchain, IoT, everybody knows these as buzzwords but few people have thought about the impact of the use of them. Look at—I am addressing young students near here in Cambodia. They have skipped the stage of books. Very few read books. Because the internet came in, they have no good habit of reading, and now you have Facebook. Critical thinking not well thought. There are a lot of things on the internet and you know, I know, as a teacher, as an educator, that 90% of the content of the internet is just garbage. Nonsense, ignorance promoting further ignorance. So what would be the best way to educate the students starting from primary school? Certainly to use a smartphone. Actually, they don't need to be taught. If you want to learn a new app on a smartphone, just sit at home and watch your grandchildren, they will teach you. I always smile when you have a committee of top policy makers my age looking at smart cities for the future. No, you should have 9-year-olds, 13-year-olds, 15-year-olds sitting on the committee, they will teach you how to use those tools. The role of the elderly is to provide the wisdom that they don't have, the critical thinking. Facebook is a tool also, a dual tool, it could be good or it could be very bad, you know the dark web, etc. So technology requires wisdom in the mind; before you put the mobile device in people's hands, they need wisdom. In a country like Cambodia, which is developing very fast, we've been using the internet for almost 10 years. There's no law on the internet, you cannot blame the government. Technology is going so fast. The Cambodian population is very young, with a bright future, 70% below the age of 30. Any technology they will adopt it. They don't question it. They don't have the intellectual tools to question that. So they are early adopters. By being early adopters the good and the bad come together and policy comes after. This is a challenge for all governments, not only the royal government of Cambodia, but of any developing country.

So, number two, smart citizens. "Smart citizen" means somebody who can use tools within a society to deal with everyday life, to make a living, to make interactions, to raise a family in good harmony in society. To think of other people. It's unbelievable when you walk in the streets of Phnom Penh, people dump their trash in the street. And we call this country a kingdom of wonder! But many of our citizens don't respect their kingdom of wonder. Nobody would do that in Japan. In Japan the technology has come after the wisdom. There are not many countries like Japan, and I show my respect to the Japanese civilization. Despite all the advancement in technology, you Japanese are still very traditional, still bowing to people, respecting people in the public space. I smiled when I traveled to Japan over the last three months. I saw a banner that said, "Good manners Week in Japan." I asked myself, Do the Japanese need this? I believe that it was not for you. It was for new rich tourists coming to Japan, to educate them. Not for Japanese, you don't need that. I think you Japanese are so polite that, at one point, you are so polite that you get stuck in one corner because of that extreme politeness. But that should be a model and Cambodian people should learn, particularly young people should learn of these civilized manners as good citizens. So, good citizens, let me be more practical. Phnom Penh, if you live in Cambodia, already has some smart-city patterns. Where do you work? My son trained in digital technology, in AI. He has no office. But he has a job, people pay him. He says, "Daddy, I'm a digital nomad. I can work from everywhere. When I'm sitting here with you, I look very impolite, I work with my smartphone here, because I still give some advice to my dear colleagues at CDRI for a few things, I contacted the Ministry of Foreign Affairs this morning for a few things, this is a tool for a smart city already. If you call Grab once, twice, the next time you call you don't need to tell them where to go. They know where you are and where to go. Many of us watch Netflix. When you watch Netflix once or twice, the service makes similar content come. So being a smart citizen is about using these tools to augment your intelligence. Human intelligence is limited. I don't think that artificial intelligence will replace human intelligence. I even think that "artificial intelligence" is a misnomer. There is no such thing as artificial intelligence because no machine ever—I'm a neuroanatomist—would have the flexibility of the networks of billions of neurons in our brains and in our minds.

I'd like to come back to the citizen. I think that as citizens of Cambodia young people have to be aware that they have to learn wisdom from the old sayings, read more books before jumping on Facebook which is full of misinformation. And we are now at the global stage moving into these smart cities, to the point where we get so much data that the reliability of the data is questionable. We even say we are entering the post-truth era. Fake news. You heard about the smart city, Cambridge Analytica, getting data from Facebook illegally. So Facebook provides data for profiling millions of American citizens so the Russians can manipulate their minds to affect the election of the President of one of the great countries of the world. Brexit is the same. So all of these things are the consequences of smart cities. Data, data privacy, huge data, Big Data—What to do with that? Using data is not about AI, is not about technology, and I love technology. Using Big Data is about wisdom. Wisdom is respecting hierarchy in society, respecting teachers, respecting parents. I can share with you a past experience when I was young. Every night on the weekend I spent time with my grandparents. I do massage for them and then I bow to their legs, to their feet, before I go to sleep. Now what do you do before you go to sleep? You kiss your smartphone, you've forgotten your loved ones, and when you wake up in the morning the first thing you do is to reach out to your iPhone. It's called addiction. Addiction to the point where a smart citizen now—a study shows that the young generation now has an attention span shorter than that of a goldfish. You touch your smartphone at least 2,000 times a day. So that is about a smart citizen.

I move now to the next point, which is smart governance. If you have a smart city, you need smart governance. You need bureaucrats who can make sense of data. If you cannot make sense of data on paper, how can you make sense of a huge amount of data that includes quantitative data, text, images and sound. How can a bureaucrat help us in running and governing a smart city? That's very important. I went to Shenzhen, a very advanced smart city in southern China. The most striking example: I met a beggar with a smartphone. If you want to give him money, you scan his QR code and give him five yuan. A smart beggar in a smart city. It's there, it's real. I went to visit my son who works there with my wife. At 4 o'clock, we needed a snack on the campus. New campus, I wanted to buy a banana. It was impossible to buy. "I don't take money." "I don't take credit cards." I had my smartphone, I had WeChat, but I'd forgotten to download the wallet from my son. So you can't do anything. It's interesting how sometimes smart things can block that. So smart governance is important. I believe that smart governance and smart citizens need education and training at all levels, not only at the science and technology level but also teaching values, on philosophy, on the heart matching the brain, augmented by the computer, and most of all a golden heart.

And last, smart finance. Very important. Who will pay for that? So this is good, you have a huge amount of data that the governor of a city can use to collect taxes. Every time you go somewhere they collect taxes immediately. And now, on top of Big Data, on top of AI, on top of the internet, you have blockchain. Instead of sending information to the internet you send value through a blockchain that allows a very clear and transparent transaction and no loss in tax collection or paying debt. One example I just imagined, in the very near future somebody can walk to Aeon—a Japanese investment in Cambodia, thank you so much—you walk in, Sunday morning. Because they have your data, at 9 o'clock there's a Grab waiting in front of your house. You didn't call them, but they know your habits, they know you. They wait there. You go. On the way they know exactly what coffee you want to drink, what grocery store you want to buy at, what clothes you want to buy, and it just says go, and IoT with many sensors put in your bag and you just walk out. The Grab brings you back home. Nobody will talk to you. If you walk out, and there's no sound it's OK, but if you walk out and there's a sound it means your wallet is empty. So this is a new way to live in a smart city, with the good and the bad.

> "Building a smart city from scratch is a lot easier than redevelopment or converting existing cities into smart cities"
>
> C. Babbu 2016

And most of all I look at this scholar from India. He mentions this, that building a smart city from scratch is a lot easier than to redevelop converting existing cities into smart cities. Just food for thought. So overall I'm just sharing with you mostly from my heart about life in a smart city. It's quite good to look through that but still we need a space, a drama in time, with a lot of green space like the late Vann Molyvann said, and an education system. Our education system can equip our children for the future of Cambodia with skills and values.

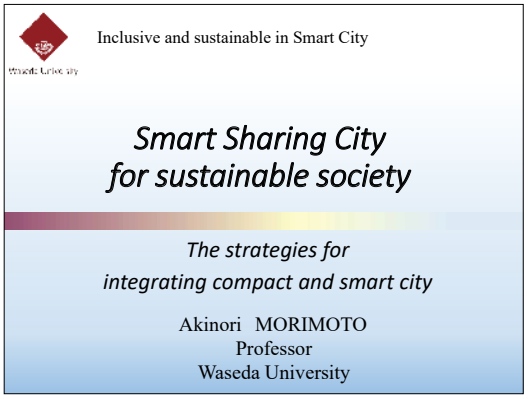
And finally I'd like to thank our distinguished colleagues from Japan. You have all the good things and technologies and marrying them with a great tradition of respect and dignified societal life. We need to learn a lot from you. Thank you very much.

Dr. Akinori MORIMOTO
Professor, Waseda University, Faculty of Science and Engineering/
School of Creative Science and Engineering

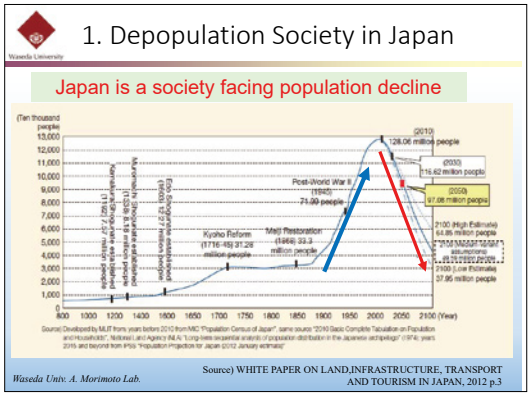
Session 1

Inclusive and Sustainable Smart City

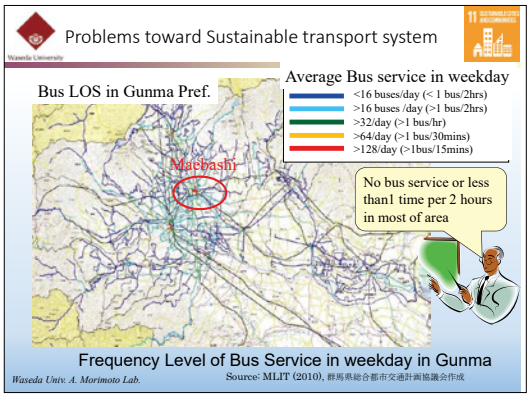
Smart Sharing City for Sustainable Society: The Strategies for Integrating Compact and Smart City



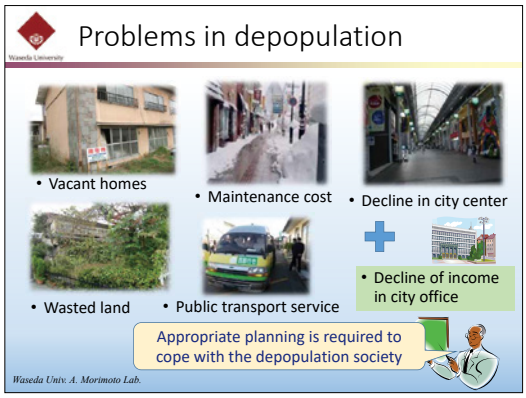
I'm very happy to be here and very honored to make the presentation about smart sharing cities today. I will especially focus on compact cities and smart cities.



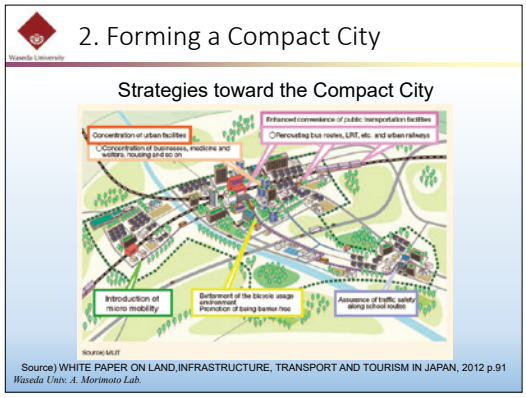
Let me begin by mentioning some things about the Japanese situation. As you know, Japan has had a rapid increase in population until recently. These figures I'm showing you are from the early to middle19th centuries, when people were living near train stations. And they show you the tendency of the Japanese population. Over a hundred years the population of Japan increased rapidly. Now our population is at its peak, and unfortunately from now it is dramatically dropping down and we have many problems. One problem is the decline of the population. That means a decline in the taxpayer base. Governments, especially local governments, are worried about future incomes.



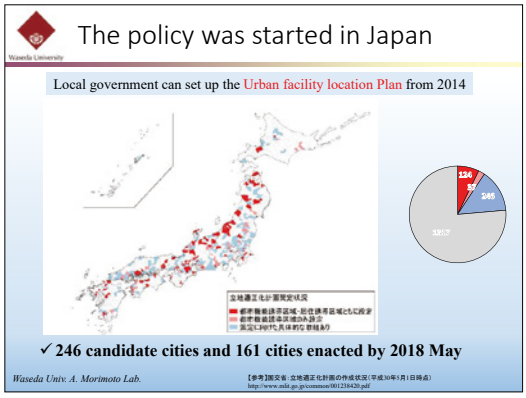
Another problem is vacant houses. You can see that this is a city that has a half million people living in it, 100 km north from Tokyo. The vacancy ratio is 15%. There are many vacant houses. And also there is a focus on public transportation, which is in an awful situation. Of course, when you go to Tokyo there are no problems. You wait just two or three minutes for a train at the station. But if you go to another city, in Gunma Prefecture almost 100 km north of Tokyo—Can you see this network? Maybe most of the transportation network you can see here is the blue one. Blue one means there is no bus service or the buses run less than once every two hours. People have to wait one or two hours to ride the bus system in these local cities in Japan.



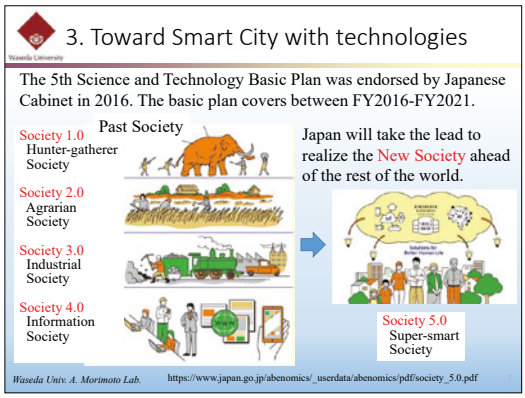
I would like to quickly summarize what the problem is in Japan, especially local cities: Vacant houses, high maintenance costs, and wasted land, public transportation, and decline in population in the city centers. Many big shopping centers appeared in the suburban areas and nobody goes to the city centers. These are kind of ghost towns.



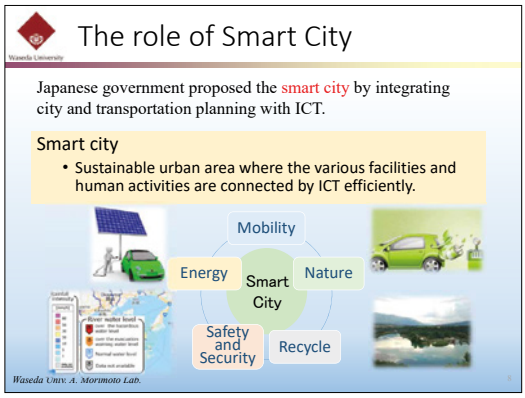
What is the next plan in Japan? The Japanese government strongly recommends compact cities to cope with the decline in population. This is an image of a compact city. You can see that many important facilities are gathered around the train station. That is a concept. Many local governments have enacted compact-city policies called urban facility location plans.



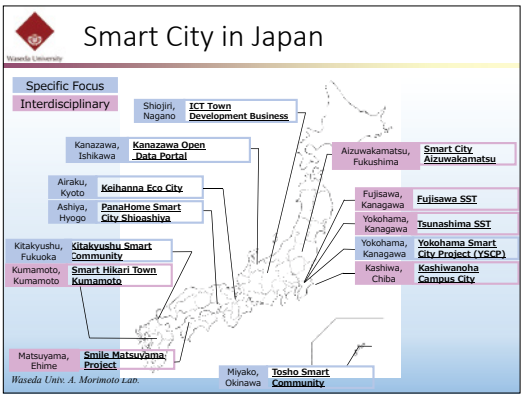
You can see that many local governments have started to promote these compact city policies. That's our real situation in Japan. Of course when you go to Tokyo you don't realize that this problem exists. It's the local cities that are suffering from the depopulation society.



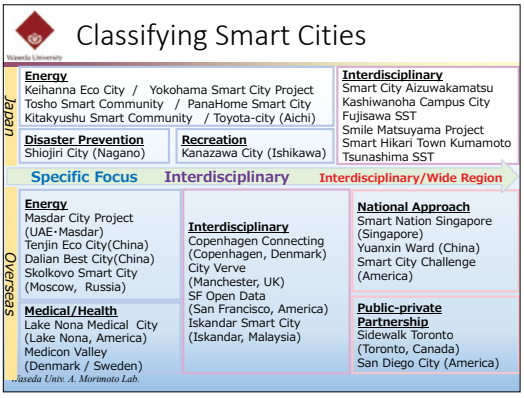
And today I'd like to mention about new technologies such as smart cities. Dr. Nakamura just mentioned about Society 5.0. This slide shows you a quick overview of what a smart city, or super-smart city, is. We divided types of past societies into four types from one to four. Hunter-gatherer society, agrarian society, industrial society and information society.



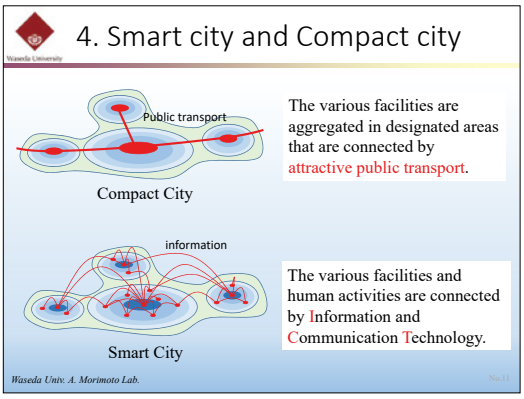
Now we move to a new society. The Japanese government has recommended smart cities using information and communication technology (ICT). This smart city, the sustainable urban area, has various facilities and human activities connected by ICT efficiently: Mobility, energy, nature, safety, security and recycling.



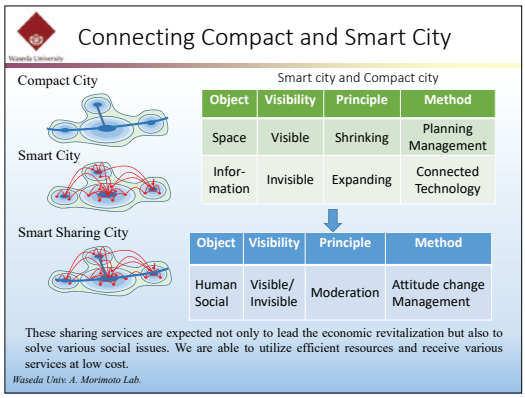
I'd just like to mention about the present situation in smart cities in Japan. Already many cities have started introducing smart-city plans.



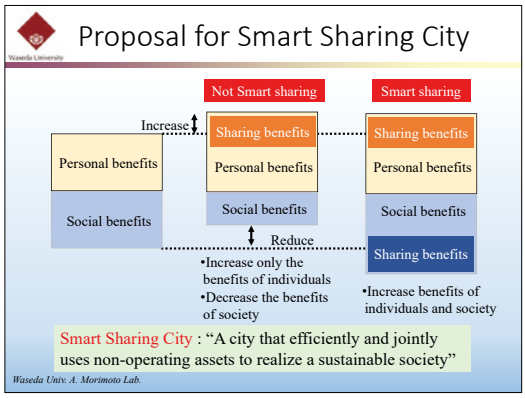
Going back to 10 years ago, this project was started. It mainly started from energy. Smart grid is one of the functions of smart cities. And nowadays we are expanding into the areas of Interdisciplinary and Wide Range, so we are considering smart cities in every aspect.



I just mentioned about compact cities. The second is the smart city. Is it a similar concept? I will quickly summarize the two concepts. A compact city is one in which various facilities are concentrated in designated areas, with attractive public transportation. The smart city is one in which various facilities and human activities are connected by ICT.

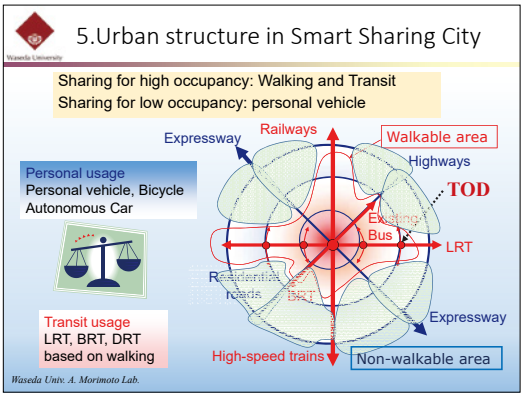


Let's try to compare the two concepts. The compact city is based on space. You can see the compact cities but you cannot see the smart cities, because the smart city is focused on information. The biggest difference is the principle. The compact city is based on a policy of "shrinking" to cope with the declining population. The smart city is based on "expanding" information. The methodology is also different. The compact city is about planning and management. The smart city is about connected technology. Also, the compact city is based on local government, while the smart city is mainly based on private companies. The timetables are different. Compact cities: 20 years, 30 years, it takes a long time. But smart cities focus on one day, one hour, one minute.

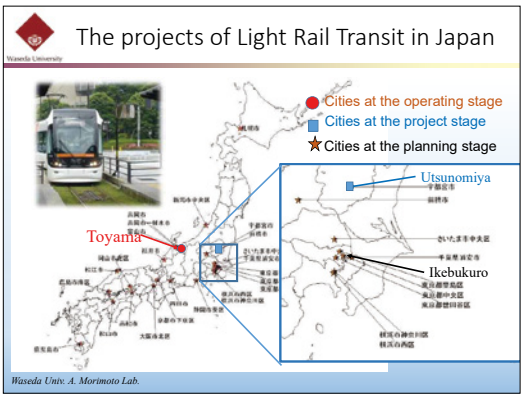


Today I'd like to share with you a new idea, what we call the "smart sharing city." The concept is similar to that of the eco-society, ecotechnology. This is one of today's keywords. Mainly it's focused on the human, social aspects. The principle is moderation: trying to change our behavior to make cities better. I'll give you another definition of the smart sharing city. For example when we focus on the benefits—personal benefits, social benefits—"Not Smart Sharing" just focuses on the personal benefits, for example the Uber system is much better using the smartphone to hail Uber rides. But if everybody is using the Uber system in private cars, or small cars, road congestion becomes severe. Therefore we recommend good public transportation. The right one is the "Smart Sharing" cities, offering not only

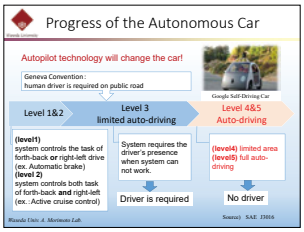
personal benefits but also social benefits, which are very important ones. We can define "smart sharing city" as a city that efficiently and jointly uses non-operating assets to realize a sustainable society.

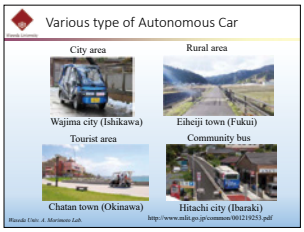


Moving onto a topic of various types of transportation modes: The upper picture is the blueprint from the NACTO. The left side focuses on pedestrians and bicycles and bus systems, with just only one lane, two lanes, through which we can move to other places. But if the focus is on the automobiles, you know 13 lanes are required. If you focus on drone systems, Uber Air, that is reported to use 38 lanes of the highway, it's impossible for big cities. in a local city, it is possible. I mean, some of the characteristics of each vehicle, each transportation mode. I have to mention about two strategies. One strategy is sharing for high occupancy, like walking and transit systems. And the second one is personal vehicles. Inside the red is based on walking and public transportation. Outside the cities the low-density areas are using these autonomous cars, personal vehicles. Much better is bicycles.

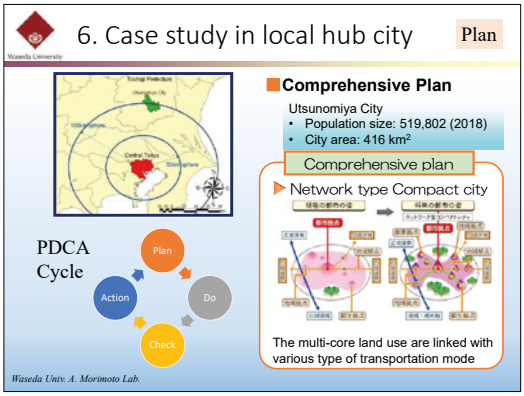


Many cities successfully introduced new tram systems, which people enjoy in the city centers.
The first one is the city of Toyama. The second one is Utsunomiya, my native town.

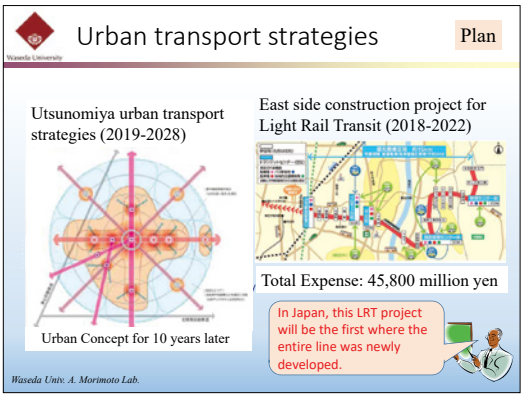




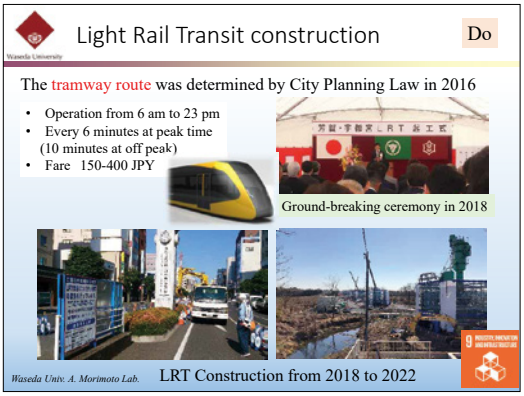
Let's move to the autonomous car, the self-driving car, expanding here and around the world. We will have to use autonomous cars in the future. The method of using autonomous cars is a very important one.



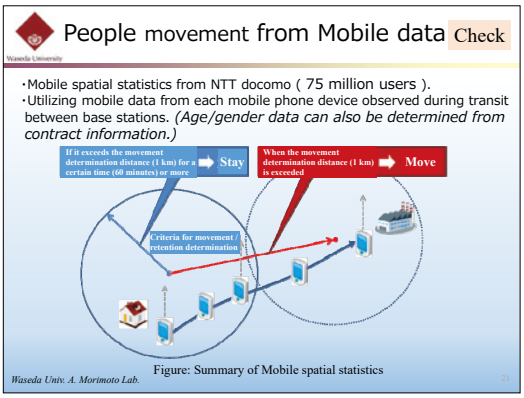
In my laboratory we are thinking about autonomous cars and public transportation: A good balance between autonomous cars and public transportation. My laboratory tried to categorize traffic volumes. There are many kinds of roads in cities: Big roads, small roads, main roads, branch roads. Using a personal computer, we can calculate in the near future how many vehicles can pass through the road and how many people are parking in the drop-off zone on the road. Using this computer model, I try to recommend some future scenarios. That is one of the scenarios. Of course autonomous cars are very important, but at the same time we have to think about where you get in and out of the cars. When you ride in a taxi, where do you get in? In Japan, you just raise your hand and a taxi will stop for you. If everyone, 100% of the people, raise their hands, what happens on the road? I just mention about parking spaces on the road.



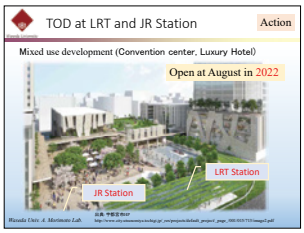
I will give you the example, Utsunomiya's urban transportation strategies.

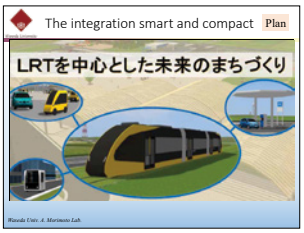


The second one is about a new tram system. Construction has started in 2018 and this will be completed in 2022.

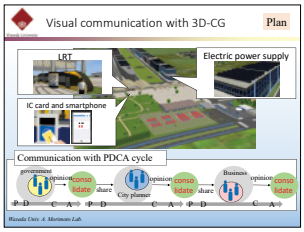


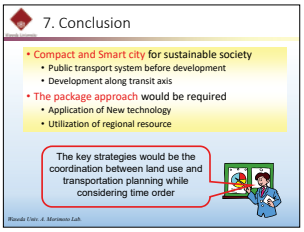
Using mobile-phone data, you can see changes in population. This graph shows you holidays on the right and weekdays on the left, for every one hour. In other words, where people are at now? Where do people move to? We can pick up some of the characteristics of the people. Young people, elderly people, how many people come from neighboring prefectures? Using Big Data, we examine how many people stay here and how many people move to other places. This one is real-time data. Using GPS data on buses, we examine how many buses pass by on the road. When we get the new data, we match it with personal data. The red data is bus data, and the blue data is personal data. When you move around with your smartphones, your movement is automatically captured. Matching with the movement of the bus system tells us who is riding the bus, who is riding the trains and who is riding in personal vehicles.





Now we try to think about the next situation. The new development is also required. Citizens do not know what will happen in the future and therefore we are making these 3D computer graphics.





Using the information shown on the slide, we try to estimate what will happen in the future. In the near future, two years from now, Utsunomiya will introduce the new tram system. What is the future for people who go to the stations and get in the trains? Using these computer graphics, I'd like to mention about the near future.

This slide is about the Shinjuku area. This is a major downtown area of Tokyo. In terms of the volume of passengers on public transportation, it is the best in the world. Now our city has changed from an automobile-based city. It's a walking place.

This slide shows street seats for the pedestrians. That is my presentation. Thank you for your kind attention.

Dr. Chanthy LAY
Deputy Head of Research Office, RUPP

Session 1

Inclusive and Sustainable Smart City

This is my presentation outline. I will give a brief overview on smart cities and then go on to smart cities in Cambodia. And then I will start to review and make an overview of the constraints and propose a solution for Cambodian cities to become smart cities and to sustainable and inclusive smart cities in Cambodia and end with my conclusion.

A smart city is a city that incorporates information and communication technology (ICT) to enhance the quality of performance of urban services and infrastructure such as energy, buildings, transportation and urban utilities in order to reduce resource consumption and also waste and also conserve time and also conserve cost. So ICT using the internet and using collected data input can enhance the quality of urban services and infrastructure to make smart infrastructure, smart services, smart technology, smart citizens, smart energy, smart government and education, and also smart mobility and smart transportation in the cities. I'd like to provide an overview of the situation of cities in Cambodia. In Cambodia, cities are the center of development. Most development activity takes place in the cities, especially in terms of housing construction, real estate, services and infrastructure, utilities, in terms of providing and creating opportunities for jobs and business opportunities. So all the kinds of things that will provide a better quality of life for the people who live in cities are better than for the people who live in rural areas in Cambodia. But the kinds of things that attract people from the rural areas to move to the cities, especially Phnom Penh—to find a better job, to find a job, better healthcare, better education, to find a better business or find a business—keep our cities' populations still growing very fast. Urban services still need to be expanded from town to town, but unfortunately we don't have urban planning or land-use planning yet. So due to the rapid population growth in the cities, particularly in Phnom Penh, we still lack services and infrastructure in some urban areas, especially in the newly established areas, in the suburban areas. So the pace of urban expansion is still faster than the pace of urban service and infrastructure expansion, so there still remains some lengthening of infrastructure and service in some areas. Through the population growth and urban expansion, cities are becoming more complicated and congested in terms of traveling, traffic and so forth, so it is complicated. In terms of waste management also, we have some issues regarding waste management. The issue of solving waste collection still remains because the capacity of the waste collection companies is limited and the waste generation amount is growing very fast.

I would like to highlight the expansion of Phnom Penh. In 1990 there were only five *khan*, five districts. But in 2000 we expanded with another two *khan*, for a total of seven *khan*, and in 2010 we reached 12 *khan*. So the city now is three times as large as it was in 1990. So there has been very fast expansion of the city. In terms of smart cities in Cambodia, in Phnom Penh I observe that the concept of the smart city has been partly introduced and opened in terms of communication. Everyone has a smartphone, they can communicate to everyone, every friend in the country, and they can check their bank accounts through their smartphones, they can check their city bus stations and bus service from their handheld phones. In terms of transportation also, we can request pickup at home by public taxi or *tuktuk*. We just request and then wait at home. The taxi will arrive, don't worry, in about five minutes. And also the traffic and also the energy. We have started to use solar power as well as electrical equipment that saves energy, at home as well as at the workplace. But from my observation there is still far to go for the cities of Cambodia to become full smart cities. We still have a long way to go to reach smart-city status.

We use ICT for transportation and traffic control. For example, we have PassApp applications, to request or order taxis or *tuktuk* for pickup at home. And we've started to install cameras in every intersection of the main roads and other roads, so perhaps soon the police will not need to stand at the intersections, they can control traffic at the office, because the cameras send information to the office.

I think that, for smart cities in Cambodia, to attain sustainable and inclusive smart cities in Cambodia, several things need to be done to improve from the existing challenges of these areas. We have to consider in terms of urban planning. We have to improve urban planning and land-use planning, and also we have to look into existing urban transport because green building and we have to consider about resilient cities, cities that can respond well to climate change, natural resources, natural environment, and look into waste management and energy consumption. From urban planning, in Cambodia, especially in the cities, we don't have urban planning. We don't yet have a comprehensive land-use master plan to guide the short-term and long-term development of the city. So that is our constraint. However, there are a few newly established satellite cities like Koh Pich and Chroy Changvar. But those cities have their own land-use plans. So for the solution I think we have to put into place urban development plans and also land-use planning, to guide and direct city development for the long term and future, and of course to ensure the sustainability of the city in the future. Land-use zoning is very important for urban development, so we have to identify zoning, to allocate land for industrial zones, residential zones, institutional zones, administrative zones, commercial and business zones and so on, so the infrastructure can be applied and accommodate each zone effectively.

Urban transport and traffic: These constraints of urban planning guide transportation development. Traffic and congestion are still complicated. Traffic is very complicated now, in terms of the sidewalks and streets. A lot of people try to use the sidewalk for their business. We also have a lot of street food vendors who use the street for their business. So it's very complicated now. We have beautiful traffic laws at the moment, but enforcement and implementation and respect for the law is still in the beginning. It still needs to improve. So our solution is that we have to put into place an urban transport master plan to apply and correct mass public transport, to get people to change their behavior of using private vehicles, to use public transport such as public buses or taxies instead. Maybe in the short-term future we can have a skytrain or streetcars. We also have to design pedestrian and bicycle paths, because the city streets are very complicated. There's no space to walk. Even if I want to walk from my home to the university, the streets are very complicated. The sidewalks are occupied by people who are parking their cars or doing their business. So we have to improve enforcement and implementation of our existing traffic laws.

For buildings: This is another area we have to consider. Our constraint at the moment is the lack of building standards. The Ministry of Land and Housing doesn't have building standards or building codes yet to check the quality of buildings. Now the Ministry and Department of Housing are still using construction permits. If you want to build a house or building, you submit the documents and the government reviews the documents and provides a permit for construction. So as a solution we have to apply building standards so that we can control the quality of buildings, to accommodate people so that they can live safely and in good health in the buildings. We also need to introduce smart buildings, like green and environmentally friendly buildings, so the buildings will have to save energy, save power and save water.

Resilient cities: Because of the effects of climate change, global warming, the temperature is increasing and becoming extreme. Increasing temperatures and changes in precipitation lead to extreme flooding, drought and other climatic hazards in the future for the cities of Cambodia. And the other constraint that we have is limited capacity for adaptation to climate change and natural disasters. All of these factors increase the vulnerability of Cambodian cities to climate change. As a solution, we have to make our cities resilient to climate extremes and disasters, incorporate climate-change response into urban services and infrastructure development, and we have to conserve our natural environment, like natural lakes and reservoirs, and we have to establish green belts for the cities. So for the resilient cities, maybe we have to learn a lot from Japan, because Japan has very good experience with resilient cities and has faced disasters, such as floods, earthquakes and tsunami. But Japan can do some remarkably quick recovery after disasters.

Natural resources: Our natural resources in Cambodia's cities have been encroached by development activity. Some natural lakes and natural reservoirs that we have reserved as storm-water reservoirs have been filled up for development. Some of the lakes to the north and south of Phnom Penh have been filled up to convert into residential and commercial areas. So as a solution we have to stop the encroachment and respect and conserve existing natural lakes and reservoirs, and clearly

identify and conserve green urban space and enrich urban ecological zones, and enhance the functions of the natural environment for the health and safety of the city and its citizens.

In terms of waste management, we also have some problems that we have to consider. We don't have sufficient sewerage and drainage to drain the storm water during periods of intense rainfall. Most of the natural reservoirs have been plugged, so during intense rainfall all the water has to go into the drains and sewers. They do not have enough capacity to drain all that storm water during intense rainfall. So our cities are still vulnerable to flooding during intense rainfall because of the low capacity of the drainage and sewers. Waste collection has also become an issue. Assisting waste collection companies that still have limited capacity to collect all of the booming of the waste generation. And since our city is expanding very fast, to very big boundaries, we have to improve that. Our solution is to control encroachment; strictly conserve the natural lakes; increase the capacity of sewers and existing drainage systems; and decentralize waste management services. Until now waste management services have been provided by one company only. We have a very good recommendation from our Prime Minister that we can solve the problem of existing centralized garbage collection by dividing Phnom Penh into four zones for waste collection and each zone will be handled by individual waste collection companies.

In terms of energy, yes, we still have problems, because we still depend on energy supplied by generators and still use conventional meters for power consumption. As a solution, we have to change the behavior of power users to use energy-saving electrical and electronic equipment. Also we need to introduce renewable energies such as solar and wind power.

In conclusion: Cambodia's cities are still far from reaching the status of smart cities. But we have to consider about smart city managers and smart people and smart citizens as H.E. Dr. Chhem Rethy mentioned. And also we have to consider about smart systems in cities to enhance mobility, safety, health and the economy. Urban planning is very important for smart cities. We don't have urban planning and we don't have sustainable development for the whole city.

The last one is population growth in the cities. We have to control population growth. We have to develop smaller cities, maybe in the suburbs or in rural or provincial areas, and increase development activities in the rural areas. So the tendency is to stop movement of people from rural areas to the cities to find jobs, to find better education and so on. Thank you very much for your attention.

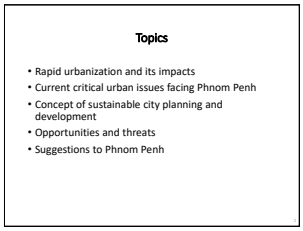
Dr. Shizuo IWATA
Chairman, ALMEC Corporation

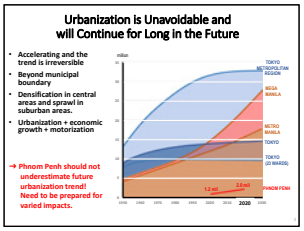
Session 1

Inclusive and Sustainable Smart City

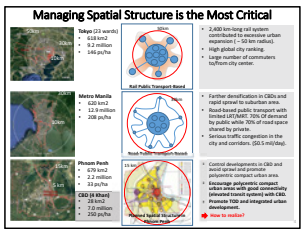
A Practical Approach to Sustainable City Planning and Development

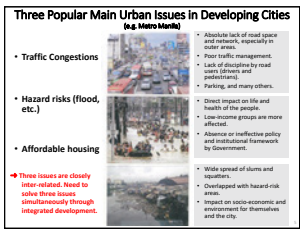
Good afternoon ladies and gentlemen, I hope you don't get tired. Be patient, another 15 minutes. My presentation today is a practical approach to sustainable city planning and development. Thanks for good information about Phnom Penh before my presentation. I run a private consulting firm and I've been working as a consultant on urban transportation development in developing Asian countries such as Vietnam—Hanoi, Danang, Ho Chi Minh—and especially in the Philippines—Manila, Cebu, mainly for JAICA funding. So my presentation is very practical. We have talked about a lot of ideas and policies, but our role is to determine how we can make a doable project. Because whenever we have beautiful ideas, unless we can implement them and transform them into tangible projects, the government cannot do them and the people cannot benefit.





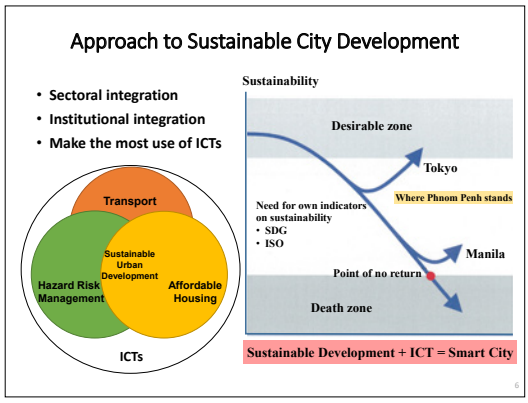
So today I'd like to touch on the rapid urbanization that is taking place everywhere in developing countries. What are the critical urban issues facing Phnom Penh? And to define the concept of sustainable development in practical terms and where the opportunities are to promote sustainable development, I dare to suggest some proposals for Phnom Penh. Let me try.



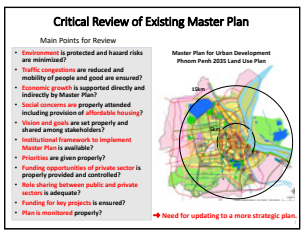


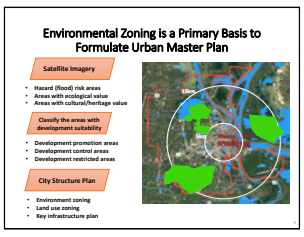
I have picked up three cities with different urbanization processes and socioeconomic backgrounds: Tokyo, Manila and Phnom Penh. Different size. But I'd like to focus more on the similarities among the three cities rather than differences.

One is speed of urbanization. A latecomer like Manila is urbanizing faster than experienced by Tokyo. Second, the growth goes beyond the existing administrative boundaries. The Tokyo central area sees a population increase, then the suburban areas grow, and finally the metropolitan area is still growing. Number three is densification. Population density in the central area is going to move further. At the same time suburban expansion of the cities will continue. So Phnom Penh has just started urbanization. So in which direction is Phnom Penh going? You have a lot of experience from other cities. So you should make the right choice.

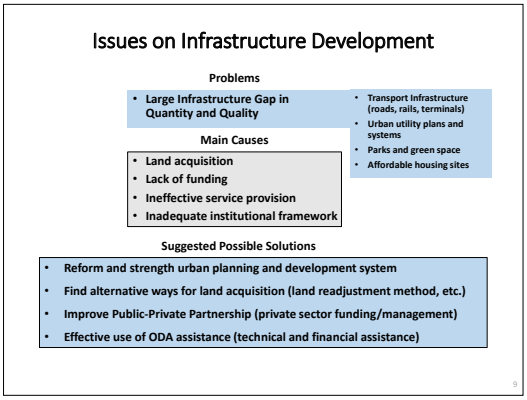


Let's look more closely at these cities. First, you may be surprised to learn that Tokyo and Metro Manila have common features. Over 70% of the people are served by public transport. Tokyo is one of the largest urban areas in the world, with a population of more than 13 million. Tokyo ranks as one of the top-ranked cities in the city rankings of the world. Although the urban area expanded to the range of 50 km, people can still commute with an average of one hour. So Tokyo has sprawled to a very big size, but because of its 2,400 km of railway network, people can still commute to workplaces in the city center. On the other hand, Metro Manila has an urban area similar in size to Tokyo, slightly lower than the Tokyo metropolitan area. Because it is congested, more than 70% of the population is served by public transport, but mobility is extremely constrained. There are three urban rail lines, all located in the city center, but they have limited capacity. Therefore the people who can only afford to own houses in suburban areas, where property prices are low, spend a lot of time commuting. One research study indicates that people have to spend from 2.3 to 5 hours a day commuting in Manila, creating a $0.5 million economic loss every day. That means congestion costs Manila almost PHP100 billion a year. So that is the cost of congestion.





It is said that now Phnom Penh does not have a city plan. But I found in a past JAICA study this spatial structure of Ho Chi Minh City. This indicates a polycentric pattern rather than a monocentric pattern. So this plan indicates the development of subcenters. In the same study, it is also indicated that the subcenters are connected by mass transit. So I think that is good enough as a start for Phnom Penh, because in Phnom Penh's urban area, the four khan in the city center with a size of 280 square km already accommodate 7 million people. That means the average population density is 250 people per hectare. That is far more than Manila and Tokyo. Tokyo's population density within the 23 wards is only, as you see, 146 per hectare. So 250 people per hectare in Phnom Penh's four khan, so you can imagine without any transport infrastructure provision . . . So, we would like to suggest that the government should look into establishing subcenters in the outer areas. How to realize that?



Urban problems are complex and wide-ranging. That makes city planning very complicated. To simplify congestion, what are the key urban issues? So this is the case of Manila. We have narrowed down to three issues. One is traffic congestion. The second is hazard risks and floods. And the third is affordable housing. Many people come, you cannot control the people coming into the cities. It's easy to say, "we control the population." But that can only be done in some countries. So once people come, we have to provide them with affordable housing.

Another complicated thing about urban planning is that all three of these issues are interrelated. So we have to fit the three into one. We can find projects or policy activities to address these three issues at the same time. Of course, we can do traffic signalization and flood control sector by sector, but this is not the solution.

Sustainable development: Before we go into detail about what we are going to do we have to define what sustainable development is in the urban planning context. We have, as I said, transport, affordable housing and hazard risk management. All of these areas overlap with the area of sustainable urban development. But today we have strong help from the ICT. So if you have sustainable urban development with the help of ICT, that is a smart city. That is how we have interpreted it.
If you look on the right figure, the side indicates that when sustainability goes down to a certain level it cannot return to a sustainable level anymore. Where does Tokyo stand? Tokyo is close to the desirable zone, according to the world ranking report. Manila is very close to the death zone. Where does Phnom Penh stand? We have to define this.

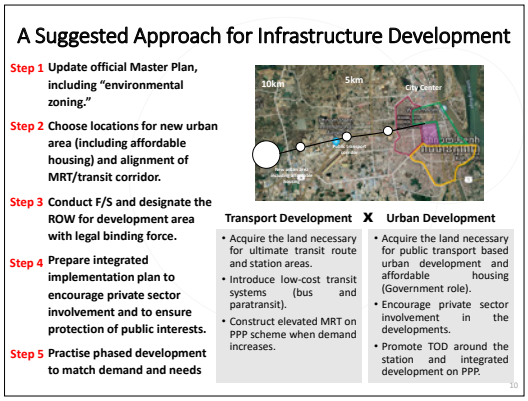
Once you go beyond the point of no return, you go into the death zone. Manila is very close, Bangkok is close, Jakarta is close.

I have found the Phnom Penh master plan for the target year 2035. At present, all urban activities are concentrated within a 15 km range. But this plan must be reviewed from the environmental viewpoint. Whether the environment is protected, traffic congestion is reduced, economic growth is supported as directed by the master plan, social concerns are appropriately attended—especially the provision of affordable housing—and the vision and goals are set properly to share among the stakeholders. It is not only the availability. The master plan must be supported by the people. Otherwise we cannot make a move. An institutional framework to implement the plan is available. Making a plan is one thing. But how to implement the master plan is another thing. So for this one we have good regulations and control measures. So, while many possible projects can be identified to improve the cities, we have to assign the proper priorities. The funding opportunities in the private sector, if properly provided and controlled, should be used because the money is there in the private sector. Government should make use of that money. The role-sharing between the public and private sectors is adequate. Now, the private sector is much stronger than before, not only in funding but also in management of operations. On funding for key projects, especially this one, I'm talking about on the government side, for the key projects we cannot implement hundreds of projects at the same time. We have to prioritize and we have to focus our attention on key projects. Then the plan must be monitored properly.

Then, what to start. I'd like to put environmental zoning first on a priority basis to formulate an urban master plan. First of all, the environment should provide the basis of urban planning. A practical approach is to identify those environmentally sensitive areas such as high hazard risk areas, areas with ecological value and areas of cultural-heritage value. Here I'm using a satellite image. Thanks to these satellite images, we have a good database of things that have to be protected. Then we go to the so-called "environmental zoning." Then we classify the areas suitable for development. So areas will be classified by their development suitability, such as areas where development is allowed and promoted. The second one is one where development is allowed but controlled, allowed under certain conditions. A third one is a zone where developments are restricted. This kind of broad zoning provides a basis for the city structure plan—land-use zoning, key infrastructure plan and so on.

But in reality the problems and issues in infrastructure development are very critical. There are large gaps, not only in quality but also in quantity. This is because of the difficulty of land acquisition, lack of funding, lack of effective service provision and lack of institutional framework, as was already indicated.

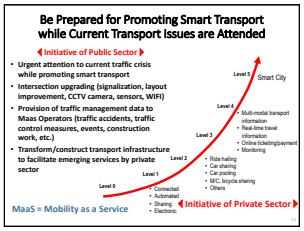
So there are four possible solutions. One is reform and strengthening of the urban planning and development system. It is commonly understood that there is no master plan. In fact there is a master plan, but it should be more firmly updated and shared across departments and even among the people. The second point is with regard to attending the difficulty of land acquisition. We have to find alternative ways of land acquisition. In Japan we have a kind of land pooling, land adjustment and renewal, so the government doesn't just focus on purchasing all the land. So there are alternative approaches in other cities. The third is an improved public-private partnership (PPP). This is the fashion among developing countries. But balance between the public and private sectors is difficult. Especially in urban infrastructure planning, the government should take the lead before the private sector proposes infrastructure, activities, and so on. And finally there is the effective use of ODA assistance. ODA is quite neutral, especially Japanese ODA. I don't know about the other countries, but Japanese ODA is quite neutral, technical and financial. So these are the possible solutions or modalities to make policies move on.

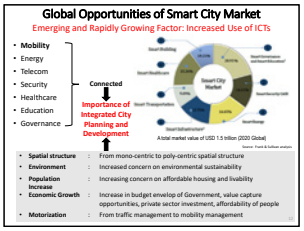


So I'd like to explain my suggested approach to infrastructure development. Step one: the difficulty in making this slide is how to integrate transport, urban development and the environment. We have to always consider the sustainable-development concept. The first step is to update the official master plan, including the environmental zoning. So, this is where development and the environment are closely linked. Step two: Choose locations for new urban areas, including affordable housing sites and alignment with MRT and transit corridors. And so also this will relate to consideration of the land support for urban development and the urban environment. Step three: Conduct a feasibility study and

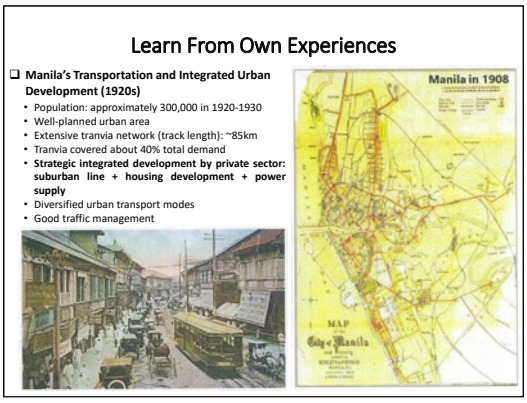
designate the rights-of-way (ROWs) of all development areas with legal binding force. So that assures the land acquisition for the land we need for development and the space for mass transit. We need an official master plan at that time. With a GIS map we can identify the locations of the ROWs very precisely. Whether the land is owned by the private sector or public sector, where it is necessary we will specify the areas for development. Number four: Prepare the integrated development plan, to encourage private-sector involvement and ensure the protection of public interest. The private sector has its own interest for getting involved, which is making money. The government must control that, from the viewpoint of protecting the public interest. Public interest and private-sector profit should be coordinated. Then practice phased development to match demand. That means that land acquisition comes first, then as demand increases over the due course of time, mass transit or public transit can be constructed. This new approach will help with the shortage of government funding, but it requires good enforcement. Clear policies of carrot and stick are necessary.

In this process we have new technologies, new areas of services which are the main topic of this symposium. On the right side, on the private-sector side, there are a lot of services that are already there, such as ride sharing, carpooling and even multimodal transport arrangements and real-time travel information. These kinds of technologies and services can be automatically developed by the private sector. The government doesn't have to get involved much, the private sector can do it. What the government should do is determine how to facilitate the private sector's activities into the government project. So there is information that only the government can provide. For example, traffic accidents, traffic control measures (one-way or by city cop), parking control, events, construction work, those kinds of information the private sector is not interested in collecting. So the government can do a lot of things to develop infrastructure in a way that enables private-sector services to function properly.

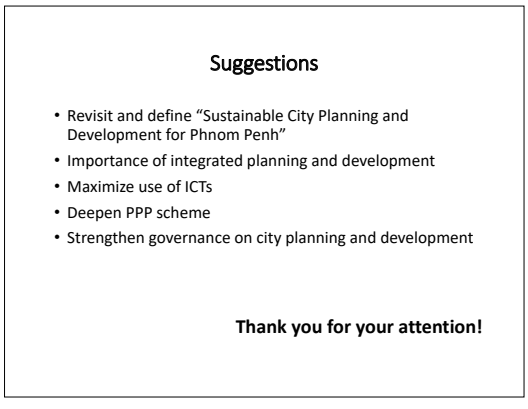




So this smart-city market is global and very big. One consultant estimated it is worth US$1.5 trillion in 2020. But the important thing from the government side is how to integrate these services and technologies into the city planning and development.



This is the case of Manila. We have to learn from many countries' experiences, not only from Japan and other developed countries. This is Manila in the 1920s, around 100 years ago. So in red you can see the streetcar network. At this time the population of Manila was about 300,000. But this extensive rail network, with a total of 85 km, covered about 40% of the demand. The important thing is that this railway line was developed and run by the private sector. Then out in the suburban areas they also developed housing areas and sold houses. And at the same time they provided the power. This is a power company. The power company developed the electric cars, streetcars, and then housing developments. All we need is already realized here. But Manila unfortunately forgot this model. But therefore the spirit of the private sector's role is significant; there is a very strong and active private sector. The streetcars and also the streets were very well managed. There were wide sidewalks, tram vehicle transport and private cars. So this is a situation we are trying to emulate.



I'd like to make some suggestions for Phnom Penh. Whether they are correct or not, please discuss in the panel session. First, revisit and define sustainable city planning and development for Phnom Penh, recognizing the importance of integrating the land, not isolating it. Maximize the use of ICT, deepen PPP schemes, and strengthen governance in city planning and development. Government has to take the lead. Thank you very much.

DAY 1

Panel Discussion Following Session 1

Dr. Soth SOK, Moderator, Dean, Faculty of Education, RUPP

H.E. Dr. Rethy CHHEM, Minister attached to Prime Minister

Dr. Akinori MORIMOTO, Professor, Waseda University, Faculty of Science and Engineering/School of Creative Science and Engineering

Dr. Chanthy LAY, Deputy Head of Research Office, RUPP

Dr. Shizuo IWATA, Chairman, ALMEC Corporation

Participants:
Dr. Soth Sok, moderator (SS)
H.E. Dr. Rathy Chhem (RC)
Dr. Akinori Morimoto (AM)
Dr. Chanthy Lay (CL)
Dr. Shizuo Iwata (SI)

Panel Discussion Following Session 1

SS: I'm very honored to be here to moderate this session. When I listen to the speech given by the Excellency and the ambassador, it reminds me of the time that I came to Phnom Penh in 1995. Phnom Penh was a low-rise city in the 90s. Japanese participants say Tokyo was a low-rise city in the 1950s and how Japan in 50–60s is similar to Cambodia. I'm just hoping that in the future Cambodia will work itself out and then we get rid of all these challenges that we face every day and from there we will be able to have a country that focus on human safety and human centric approach. Now I would like to start this panel discussion by asking the panelists to share a few words on whether this is possible and what else we have to do especially as a Dean of the Faculty of Education, I would like to have insight into what we can also do in order to make this a reality and after that I especially encourage the student to ask questions.

Question: Can Cambodia evolve in the same direction as Japan in terms of development and care, becoming human-focused, safer and more moral?

AM: "Smart city" is only a concept; to become substantial, the important thing is a combination between land plan, digital (ICT) plan and budget plan. Many young people here have to learn how to improve based on the culture, "city forms" and transportation.

SI: City planning is the key issue. Planning is a way of maximizing the future value of a city; ad hoc development has its place but without planning it can compromise the city's future value. The key to effective city planning is appropriate role sharing between the public and private sectors. This sharing has both benefits and risks: The burden of planning is too great for government to handle alone, so it requires two types of support, private-sector support and ICT. However, care must be taken because the private sector's motivation is to make a profit, not to serve the public. In sum, the role of the private sector is to provide the operational and management capabilities that government can never match, while the role of the public sector is to plan, to guide and supervise with a carrot-and-stick approach, as well as to provide certain critical infrastructure that only government can provide.

RC: Sustainability springs from a shared commitment in a community to live together with mutual respect. This shared commitment requires a two-track approach: effective policy and civil culture/respect for the rule of law. As asserted by 19th-century German biologist and politician Rudolf Virchow, policy is like medical treatment, with the general public as the patient. Medicine/policy must be sound and focused on the needs of the patient/public. On the second point, education is necessary to

make citizens aware of their responsibilities as well as their rights. Here the Cambodian people are held back by the trauma of the Khmer Rouge era, in which children grew up learning that lying, cheating and betraying were the key to survival. As a result Cambodians do not respect the public space, breaking the law (throwing trash on the street, misusing public space, etc.) and being uncivil toward fellow citizens. However, considering that Japan overcame its trauma from the nuclear bombings, Cambodia can and must do the same. Social justice must come from the government but it also must come from within the individual in the form of respect for law and the common space.

CL: Creating sustainable smart cities requires robust planning, including urban planning, land-use planning and zoning, coupled with development of the necessary traits in the citizenry ("smart people"). A key reason for the need for planning is the need for resilient cities. Cities are exposed to disasters, such as earthquakes. Also, climate change exposes cities to dangers such as rising temperatures (temperature is forecast to be 2.5°C higher in 2100 than today), flooding and changes in precipitation; cities must be made resilient against these threats. Drainage is a problem in Phnom Penh, where the filling-in of natural reservoirs for development projects has left the city increasingly vulnerable to flooding. Regarding "smart people," education and awareness-raising will take a long time. Phnom Penh has excellent traffic laws but education is needed, because enforcement is lax and compliance is poor. Cambodia is thus a long way from achieving true smart cities.

Questions from the audience

Background to Q: Basic study for a smart-city project in Siem Reap is under way with assistance from CIAJ. Siem Reap municipal government does not know what a smart city is. The city's specific needs need to be clarified. Smart cities are about more than technology but the institutional framework is not yet in place. Companies are ready with technology but the national government is not yet ready with policy.

Q: How should Cambodia start to proceed with smart cities? Cambodia's technology is far behind Japan's. Cambodia lacks the necessary institutional framework and lack of general understanding of what a smart city is. What should the government do first?

RC: Three things are needed. First, a public-private partnership, because the private sector has the technology and the drive. Second, a public sector that is clean, has sound policy and has people who are good at math and statistics. Third, get the people involved, with education and leadership. So the public sector has to do the analysis, use it to create a story that will inspire the people, then have the leadership to keep the people engaged. The smart city will be built by the young people, who are savvy about the technology.

SI: Before moving on to the smart city the city must finish the unfinished work on the basics. Take care of the poor by providing conventional infrastructure and services first.

AM: Smart cities aren't necessarily about high technology. The most important thing is face-to-face communication and the smartest transportation is walking, in a walkable city. Some says a smart transportation is a self-driving car. I don't think so. That is walking and walkable city is the best because one goal is a sustainable society.

Question and comment from H.E. Dr. Mey Kalyan: Talk about smart cities is too vague. It is pie in the sky until Phnom Penh has working traffic lights, a power grid without frequent brownouts, zoning and so on. Similarly, the moral dimension must be established first.

DAY 1

Session 2

Mr. Hong Kok CHEA, Director of Macroeconomic and Fiscal Policy Department, Secretariat, Entrepreneurship Development Funds, the Ministry of Economy and Finance

Dr. Tomohiro FUJITA, Founder & CEO of Chitose Group/(Member of Bioeconomy Strategy Council, CABINET SECRETARIAT)

Mr. Sopagna SEANG, Vice-President of Young Entrepreneur Association of Cambodia

Mr. Kei IINUMA, Incubation and Investment Manager from KSP, Inc.

Mr. Hong Kok CHEA
Director of Macroeconomic and Fiscal Policy Department, Secretariat, Entrepreneurship Development Funds, the Ministry of Economy and Finance

Session 2

Private Sector Involvement in Human Resource and Career Development for Future Eco-society

Your Excellencies, ladies and gentlemen, students, this is my great pleasure to be able to speak today, to introduce the Skill Development Fund (SDF). This is a mechanism that my team at the Ministry of Finance (MOF) has initiated to solve economic problems. So why us? Why did the MOF initiate this program? Let me give you a little bit of background. I'm the Director of the Macroeconomic and Fiscal Policy Department. At my department, we focus on, we evaluate economic issues and then provide recommendations to the management of budget planning in order to support growth. As you may know, our economic growth for the past two decades was very much reliant on traditional sectors: Agriculture, industry, mainly driven by government. But since 2015, in 2016, the ADB upgraded our status from "low-income economy" to "middle-to-low-income economy." Becoming a lower-middle-income economy means you have to deal with a lot of challenges. So what are the challenges? You would see an increase in the number of diversified sectors, meaning you see production of electronic products coming in, you see sophisticated construction materials coming in, you see technology, digital, ICT coming to the financial sector. On the one hand these things come in to take advantage of a growing economy, but on the other hand they further boost economic growth. But our challenge is that we do not have enough skill to support this foreign direct investment (FDI). Our labor is very much low-trained. Given the context, that we have a 70% dropout rate in Grade 9, it makes it very difficult to upgrade our young labor force. So what is the problem here? We looked around and we traveled around the whole country and we reviewed and evaluated our institutions and we realized that the private sector is one of the key sources of training. So why don't they train? There are many issues, many market factors, and I will go through them one by one.

Because of that we think an SDF is a good tool to at least kickstart, to test and to stimulate more investment in training, so that we can support FDI and also we can boost and sustain growth at the rate of 7%. Because going forward, to sustain growth at a 7% rate for the next 10 years, we need to boost the skills of our labor force.

So why collaboration? For the government, of course, social welfare, job creation, economic growth are so important. We have the strengths of public policy institutions, we can organize and connect on a larger scale. These are the government's strengths. While the private sector has industrial strength, it has technology, it has innovation. These are the types of training the public sector can never match. So the two sectors can work together to provide synergy, promote technology and innovation, and of course we can scale up the training of our labor. So I think it is very economical and very synergistic when the private and the public work together.

Why should we work together? Here's the challenge. Based on our research over the last three years, we found out why there is so little skills training in the market. First of all is market failure, quality mismatch. Training providers can never provide the skills that the private sector wants. There are many reasons. Because of technological change, we see different tools, different equipment acquired by the private sector, that make the public-sector training institutes obsolete, because they are using old equipment. This will continue to create a mismatch if we continue to follow the same model.

The second is weak incentive to train in the private sector. Because right now the private sector has to compete, anyone who comes along later can pay a higher price, to poach. So they are very reluctant. They want someone to jump in to help reduce the risk.

Third is inadequate information from the private sector and public sector and also our young labor force here. There's a lot of funding coming in but there's no interest in coming to get training. Also of course institutions' understanding of the private sector is weak. Our curriculum alignment is quite slow, it is not flexible. And of course culture. The cultural collaboration and trust needs to be built as a foundation.

So these are the problems going forward without any mechanism to fix the problem. We continue to see lack of trained labor and lack of investment. So what are the initiatives we need to solve this problem? To solve this market failure and lack of trust, the government came up with this SDF in 2018. It's a $5 million fund. The ADB has just put in another $9 million. And now the government has just allocated another $5 million for 2020. So we have nearly $20 million. IFAD just provided another $6 million for rural training activities.

So to fix the problem we want to make sure that all industries that participate in the program will ensure the quality of training. So this is a form of quasi-subsidy, productive subsidies, to ensure that the private sector and public schools work together to commit to deliver key performance indicators (KPI). So what is KPI? Training must be of very good quality so they have to pay a higher salary after the training costs. They have to ensure a dropout rate no more than 15%. And they have to also ensure that after the training, industry has to provide higher salaries. So this KPI actually forces all key players to ensure quality control. So if they come up with this commitment letter, they can get the funding from the government. Right now it's co-financing. So in 2019, there was the entrepreneurship development fund (EDF), it's right in front of our university. The SDF is for training labor. The EDF was initiated in 2019, this year, to solve the problems of entrepreneurs and SMEs, because SMEs lacked the networks, lacked the skills and capacity to manage and run their companies. So the fund we are creating builds the entrepreneurial ecosystem to ensure that investment, FDI from abroad will access the network so they can access SME and equity investments with lower risk.

So let me summarize again. The aim of the SDF is to boost the skill level of the workforce. The aim of the EDF is to boost the skill level of the entrepreneurs. The first is for the soldiers and the second is for the generals. We need to have these two groups of people very well trained, so that we can support FDI and sustain the economy in the long run. We've been running the fund for about a year now. This is our vision: We want to become a trusted financing platform, because of the market's lack of trust. The training providers cannot ensure the quality and that's why the private sector doesn't want to invest. Any industry that comes to an agreement, that works with the public sector, has to ensure quality. We have to make sure that we create trust through the market.

So who are the beneficiaries of this training fund? Large firms, SMEs and trainers who want to train can come up with a proposal to be a service provider. And then here are the criteria, our paid-up subsidy up to around $8 million, around $2,000 per student. We have the first round, calling, we have about 529 students, our labor force, our trainees, so nine programs, 23 companies, collaborating six training institutions, so these are the skill sets that we fund. That is the model. The private sector has to commit and the government has to also fund.

Policy in focus: At the macro level, we tried to test this total of SDF initiative and EDF, to boost innovation and support growth. Going forward we are looking forward to building up the institution to run these two funds so that later on we can scale up. This is our idea of how we can solve our economic challenges. Thank you very much for listening.

Dr. Tomohiro FUJITA
Founder & CEO of Chitose Group/(Member of Bioeconomy Strategy Council, CABINET SECRETARIAT)

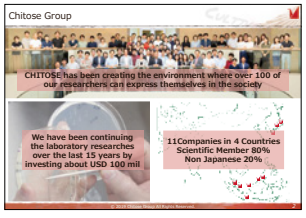
Session 2

Private Sector Involvement in Human Resource and Career Development for Future Eco-society

Creation of a New Business with Cambodia

Thank you for inviting me and thank you for giving me presentation opportunity for the Cambodian younger people. I'm very proud to show my experience to the younger people in Cambodia.

My company is named Chitose. "Chitose" means "One thousand years" in Japanese. Chitose has more than 100 members, and we see one thousand years from now, so I made our company name "Chitose."



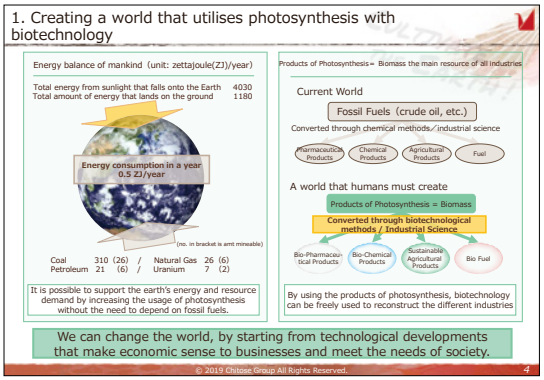
I was born in 1973. I'm 46 years old. I think my age is double that of your members. My vision, my dream, is that we human beings no longer use fossil resources. We can do it. But even your younger-aged members, in our generation, we have to use fossil resources. But after several hundred years we human beings will be living only on biomass. Now we are living in the 21st century. We have to do something for the 22nd and 23rd centuries. But we have to do something in the 21st century. So making this kind of society, biotechnology-dependent society, I made 12 companies and 10 businesses. To change society we need to make a new business.

I made more than 20 businesses. To make a new business, every business needs a will. Every business needs younger people who are eager for success. So I want to make a society, not only in Japan but around the world, where everyone can do what they are eager to do, not the things society wants them to do. So this is my challenge, not only mine but for every member of the younger generation, I think.

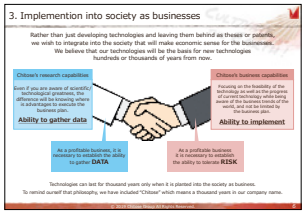
These are our members, more than 100. Actually about 120 members. About 20% of us are not Japanese. We have Singaporean, Malaysian, Iraqi, Taiwanese … right now we don't have any Cambodian people, Brunei people or Chinese. Most of them are scientists, from agricultural faculties and so on. Most are scientists and 37 have a PhD.

I have gathered more than $100 million from big companies and the Japanese government over 15 years. I'm not a rich man myself, but biotechnology requires a lot of money. Lots of money. So I have to gather from everyone, and I always say thank you to the people (investors). I've gathered more than $100 million. Now I want to make a fund of more than $500 million to make a new world in Southeast Asia. Actually I live in Singapore now and my members live in Malaysia and Indonesia, so I want to make a new world in Southeast Asia because Southeast Asia has lots of land and water and good (lots of) sunshine, and we need those things to make a new business.

Our vision is, first, as I said, to make a new society that does not use fossil resources. Second, we want to make new technologies using microbes, algae, cells and that sort of biotechnology. Third, we don't just want to create technology and write articles and patents. We want to make a business to change society. So the third one is our pride. We want to make a continuously profitable business in Southeast Asia.



This is my vision. We human beings use 0.5 zettajoules per year, all human beings. But the amount of sunshine that comes to the earth every year is 4,000 zettajoules. So I think we can do it. Because 4,000 zettajoules come from sunshine and we use only 0.5 zettajoules per year. So after biotechnology develops, I think we can do it, we don't need fossil resources.

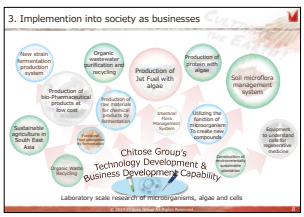


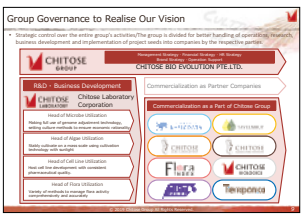
Now every industry—pharmaceutical, food, chemical, fuel—comes from fossil resources. Even agriculture comes from fossil resources because we use many chemical fertilizers and we use gasoline in tractors for farming. So I want to change to a world in which every industry is powered by biomass. Cambodia is a very good place for this because you have a large flat land, very good soil and good sunshine. And you have good younger people. So Cambodia has many chances.

We developed technology using microorganisms, algae, cells, and flora. We always think not only about making technology but also about the market size: How large a business can this technology be used in? Even when we're working in a laboratory, we have to think about how much money this technology can make for us. This is a very important thing, I think.

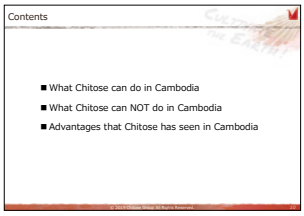
Most of our people come from the scientists' side, but many people are going into the business side. CHITOSE GROUP is in the center between the scientists' side and the business side. This is our strength and our capability.

This is Malaysia. We have made many businesses, all of which come from our laboratory in Kawasaki City. But we made many businesses in Japan, and not only in Japan but also in Singapore, Malaysia and so on, and I'm now thinking about making something in Cambodia.

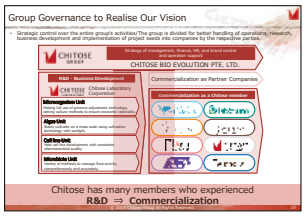


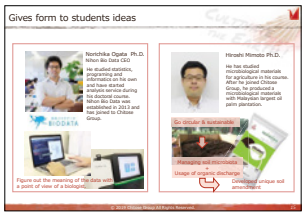


This is our group. The holding company is in Singapore. The laboratories are near Tokyo. We do a lot of business with large Japanese companies and the Japanese government. We also have our own subsidiaries. They do their own businesses. This is our laboratory and we bring technology developed there to the market (through our subsidiaries).

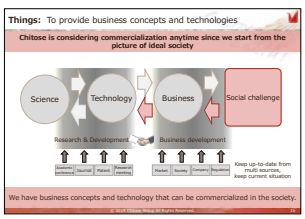


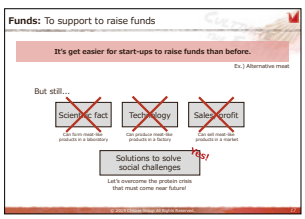
What can Chitose do in Cambodia? Our capability is human resources, doing commerce and raising funds. This is our experience. The biggest thing we can do is organization to make a new business. This is very difficult and rare, not only in Japan but also in Southeast Asia. Making new organizations is very difficult and this skill is very rare. So we can share our experience with you.



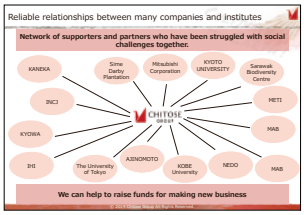


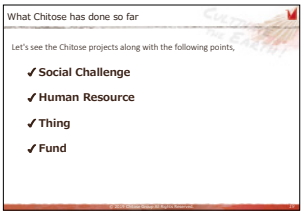
Many of our members stand on the intersection between R&D and commercialization. Going from commercialization to R&D and from R&D to commercialization is very important. Every scientist is thinking not only about science. On the right side there should be business. How much money can we earn? This is important because after we earn money, we invest it in science, which we use in turn for business. From our generation we have to always think about both science and business. They are our members. This man is one of our members and one of the most famous bio-informaticians in Japan. He has many business ideas, and I support him to make new businesses. He has an idea to create a microbe things (compost) for farm plantations. I'm helping him to make a new business in Malaysia.



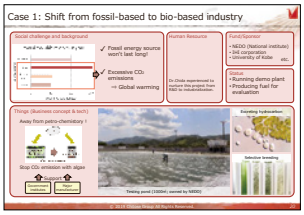


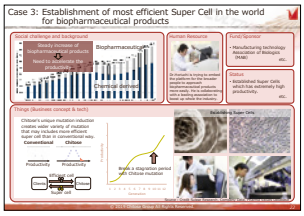
Science and technology are different. Science is the study of what is happening in our world. Technology is what we use when we want to do something. They're very different. Many students stand here (between science and technologies), but society is changing. Society and business are very close. Society contributes to business and business contributes to society. We have to stand here (between business and social challenge). If someone is standing here (points to a spot on the screen), science and society can connect with each other. That's how I can help you create a new business in Cambodia.

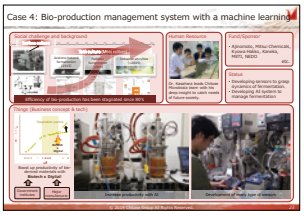




It's getting easier worldwide to obtain grants and funding. Actually I think it's not easy to raise a lot of funds in Cambodia, but every year it gets easier to raise funds. Many investors want to invest not in scientific fact, technology, nor sales profit, but in solutions to solve social challenges. If some people want to make artificial meat, somebody will invest. If somebody says they want to make a new solution for mobility, investors will invest in the new mobility world. Nobody invests in scientific fact as such, technology as such. Investors invest in solutions. This is very important. But many Japanese people confuse these things. This is the reason why I am able to raise a lot of funds in Japan and I think Cambodia can do the same. Many Japanese want to invest in Cambodia because Cambodia has great potential. But if you just say, "I can do something," it's very difficult. Instead, if you say, "I want to solve a particular social issue," you will be able to find investors, and I can help you.



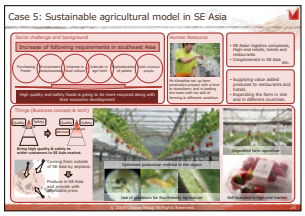


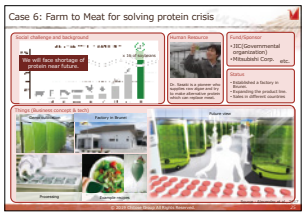


I have engaged in many collaborations with the Japanese government and companies and also Malaysian companies and the Malaysian government. I have a lot of experience in connecting with them. But I can't say that I

can teach you; rather, I can share my experience. The question of how to make lots of money is important, and only younger people can do that. So you have many chances to raise a lot of funds and create a new business in Cambodia and contribute to Cambodian society.

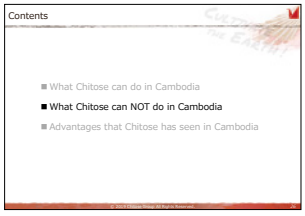
This is our case, our experience. This is a project to make fuel from algae. This is one of the biggest test plants in the world. Next one: We want to make a sustainable palm plantation. We made a sustainable palm plantation in Malaysia and we want to expand throughout Malaysia and Indonesia also.



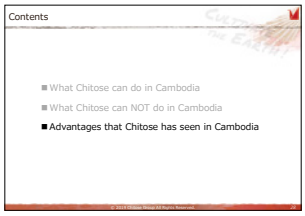


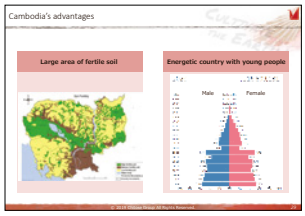
We also have the best cells for making biopharmaceuticals. Our cells are the best cells in the world. So we try to expand our cells to pharmaceutical companies all over the world.

This is a new AI machine learning bioproductivity system. We collaborated with a machine learning company and a sensor company to create a new business in Japan. Also we have a farm in Cameron Highlands, Malaysia. Our members come from Malaysia today. We made a sustainable farm (in Malaysia) and sell strawberries, mini tomato and corn in Kuala Lumpur and Singapore. We can also make a sustainable farm in Cambodia. Before we went to Malaysia, Malaysian farming was not so good. They used many pesticides and chemicals. The water pollution was terrible. We tried to make a good plantation in Malaysia. We also have a farm in Brunei. We want to make protein from algae, so we built a factory in Brunei. The country of Brunei invited us.



So what we cannot do in Cambodia? Actually, we have no operations in Cambodia right now. We're coming here for the first time. But we have experience and knowledge, so we can share that with you to help you to do something. I can't say "teach," but rather we can share with you, learn with you. The most important thing is eagerness for success in the younger generation. We can learn with you. We want to see who is eager to succeed, eager to make a business. This is the most important thing, I think.





Cambodia has some very big advantages. Cambodia has very fertile soil. This is one of the rarest resources in the world. The USA, Argentina and Ukraine had good soils, but they lost them. This is actually a very good point in Cambodia. Also you have a younger generation. This is also a very good point. You know our situation in Japan: Our population over 60 years of age is double our younger population. This is Japan. If you come to Tokyo, you will see few children or young people. I'm 46 years old—in Tokyo I'm one of the young ones! Can you imagine? No children, no younger generation in Tokyo. The younger generation is a kind of treasure in Cambodia, I think.

So you have good land and good younger people. We can share our technology and how to make a business, how to do commercialization.

We can share our technology and our experience and if you have someone who wants to make a business, I can help you. I took two members from Japan to Malaysia and (pauses for applause for the two members). They want to have conversations, they want to have a discussion with you. We will be in Cambodia for three days, so please talk to them. I am a little bit older than you but they are in their thirties, so it is easy to have a conversation with them. Thank you very much.

Mr. Sopagna SEANG
Vice-President of Young Entrepreneur Association of Cambodia

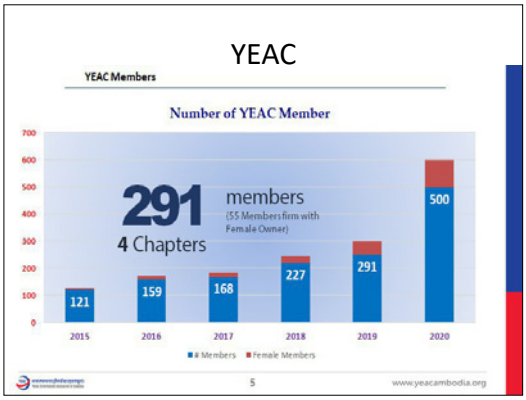
Session 2

Private Sector Involvement in Human Resource and Career Development for Future Eco-society

Ladies and gentlemen, good afternoon. Students at the back, are you still awake? OK.

The Dalai Lama once said, "When you talk, you only repeat what you know. But when you listen, you learn something new." So you all are very lucky today. You have come to this symposium and you have listened. You will be hearing from prominent researchers in academia and experienced people. So take this as a very valuable session for all of you and try to pay attention and ask as many questions as you want. OK?

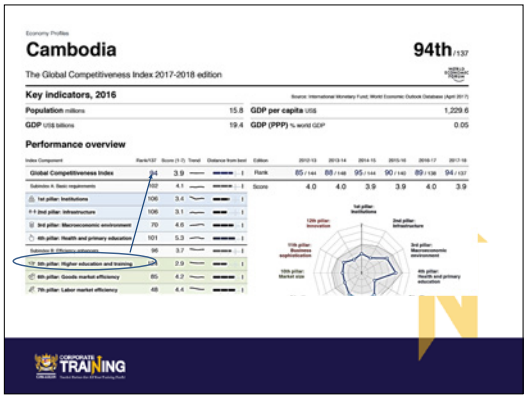
Twenty years ago I was a student at this university, and around 20 years ago as well when I was studying here I was trying to apply for a scholarship for an exchange program. Luckily I won the exchange program, funded by Honda Foundation. So today I am grateful for both Royal University of Phnom Penh (RUPP) and Honda Foundation for their support. I went for its Forum in Suzuka, Mie Prefecture, around 15–16 years ago. And I learned enormously from that very good program. And today what I'd like to share with you—but before that, actually this morning I was very nervous listening to the eloquent speakers before me because they are very sophisticated in their research and they have in-depth presentations. And from a business side, from the private-sector side, I probably do not have anything that is so in-depth, but I do have something that is really practical at least in the context of Cambodia and I think that young people must know about that, and it is good that we do it in a university because the university produces people for the private sector. Of course for the public sector as well but we private-sector people want quality human resources from the universities. We do not want to see a big gap from the university graduates and the employees in the companies. We want you to be very well prepared when you get to the university and then you are poised to be successful in your corporate life and you can also start something up yourself. In fact now we have a lot of support from the government and from other support institutions on startups.



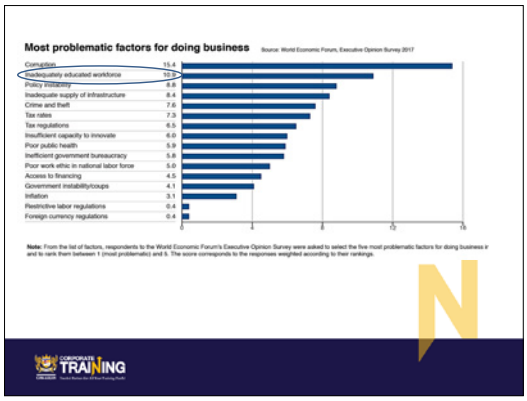
OK. I am Vice-President of Young Entrepreneur Association of Cambodia (YEAC). YEAC has almost 300 members now, and we have our chapters, our branches, in Kampong Cham, Siem Reap, Battambang and Banteay Meanchey Provinces. By 2020 we want to increase the number of young entrepreneurs to 500. So this business association is one of the most active business

associations in Cambodia. If not the most, it is among the most active in Cambodia and I hope that some of the young people here will become our members in the future, because I am going to graduate from YEAC in the next few years. It's your turn, actually, to join.

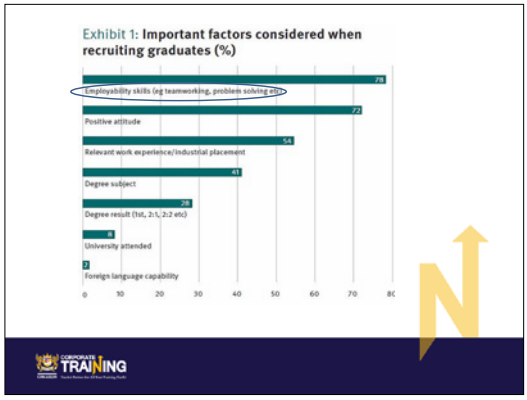
We have a wide range of businesses in our association, but a big chunk of it is in construction and in real estate, followed by tourism and hospitality. We also have trading and technology as well. We're going to discuss more on technology because this is really important. It's the topics today. It's timely and really important.



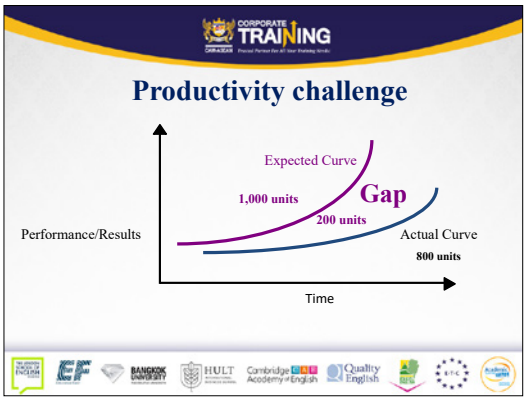
By the way, before I came here I decided to look at what other people say about Cambodia, particularly about the Cambodian labor force. So I went to this World Economic Forum (WEF) back in 2017 and 2018 and they had a statistic from the Global Competitiveness Index. They ranked Cambodia 94th out of 137. Are you happy about that, everybody? Do you agree, that we are ranked so low in terms of our competitiveness? So 94th out of 137. But look at the pillar on higher education and training. Our rank is even way lower. It's 124. Out of 137.



Now, the WEF conducted an opinion survey with executives in the same year and they asked executives in the companies to rank the five most problematic factors in doing business in Cambodia. Number two was an inadequate educated labor force, followed by corruption. I don't know whether or not you all agree with all of this. I don't know whether you agree or disagree with this finding, but this is something that probably we in the university will have to look into and try to do something about. Maybe we can move our rank a little bit further over the years. OK? Sorry to block that.

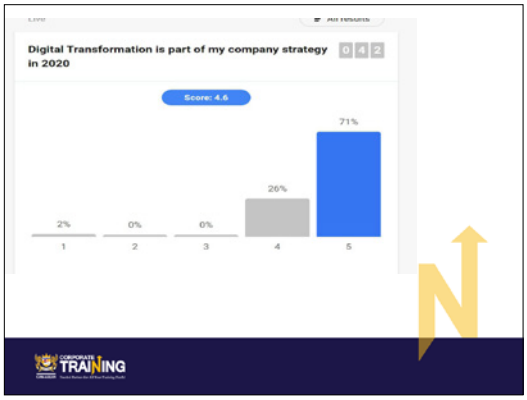


But anyway, as a private-sector representative, when we look for graduates to come and join the companies, currently in Cambodia, we do not ask so much what university you graduated from or what degree you are holding. Mainly it's all about your employability skills. Your ability to solve problems, your ability to work in teams, your ability to work together to bring the company forward. This is more important. Because generally you will be trained in the companies. Companies train people's minds. The university trains you to be ready for the workplace, but you do not necessarily hold the skills you need to do the job. But so long as you are well trained and well-groomed in the university you are ready. You become a seed that can grow anywhere it is planted. OK? So usually companies ask for this and follow with positive attitude. Once again, positive attitude is an attitude that you guys can get along with everybody in the workplace.



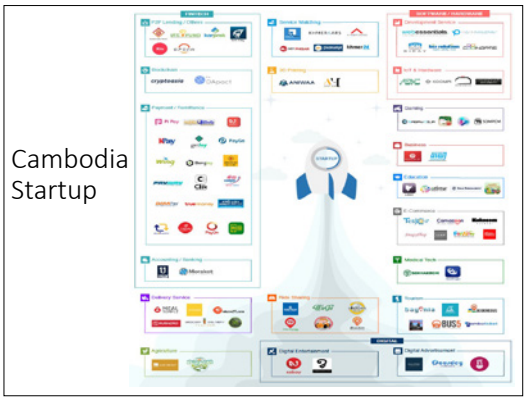
So the problems we are facing generally in the private sector is about the productivity challenge that we have in our labor force with young people. For example, this is the expected curve. We want to produce 10,000. Expected curve is 1,000 units. Generally, over a certain period of time we can only produce about 800 units and the time is even longer. That is the productivity gap that we have. And we want to bridge that gap. And only universities and the private sector—and of course the role of the private sector is also important in bridging that gap. OK? Now I will show you more. Because I work in this Association and I'm very worried when I'm asked to speak in this symposium because I know I'm going to be talking to professors and university students and they will require a lot of empirical data.

But then we ask the question: What are the challenges you face in digitalizing your business? And then you see that the majority of them says that they themselves either have limited knowledge of digital technology or they have a shortage of expertise in digital technology. So that is a problem with our SMEs in Cambodia, when it comes to their readiness to embrace digital platforms and technology overall. So we are working very hard now to get them to try to move to digital platforms. Because this is one of our strategic objectives in the Association. Because we know that going forward if we do not embrace, do not incorporate digital technology, if we do not go digital, our company may be marginalized. It will be taken by big companies. OK, so maybe we will have to go faster now. And this is one of the main roles.



So I asked my members: Please conduct surveys of our members with regard to their readiness to adopt technology or to go digital. So we asked them some questions and these were the findings with some 200 companies, 100 in Phnom Penh and 100 in Siem Reap. We asked them, first of all: Is digital transformation part of your company's strategy in 2020? So without any surprise the answer is yes, almost 100%. On the rank of five, 71% say "Absolutely, it is really part of our company's strategy to go digital." Another 26% say something about that as well. So almost 100% say that they want to go through a digital transformation for their company.

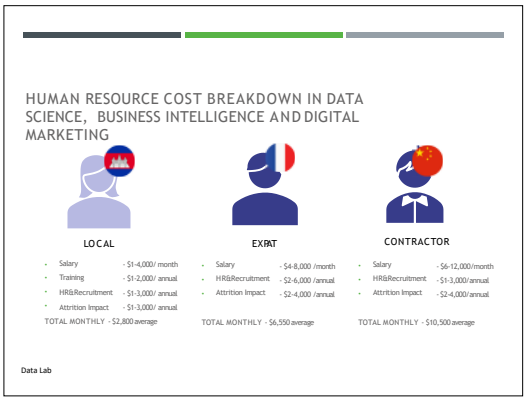
And then we ask them a further question, the last question, that is interesting as well: Which aspects of business have you digitalized? So generally our members say that they only digitalize mainly on the business process, but not on the business model. So they can digitalize processes and operations but they do not know how to digitalize their business model, or they may not be willing to invest, because the costs may be really high.



OK. So I would like to, at this point, to draw your attention, particularly the young people, to the efforts on startups in Cambodia. There are a number of startups, from fintechs to service matching, education, e-commerce, medical, medical tech, and many other startups. And I take the opportunity to tell the young people that you should try to understand this. Many startups fail. Because you can imagine, many of you want to own your own business, right? Out of 10,000 ideas you might have today, probably only 100 can come up into the business plan stage, business ideation stage. And then probably only 10 can go into startup. And out of 10, probably only one or two can survive for a few years. But it is worth knowing and worth studying that you should actually try to get to know all of these startups. There are a few places you can go. There is Packup, there is Rentree, and a few other places and you can actually go and find out what is there. OK? For young people.

Now I would like to touch briefly on the job demands in terms of data analytics and digital jobs. You can look at the market from the link in here. Over the past 20 years the demand for data jobs has increased 10 times over the past 20 years. But if you look at the job announcements in major Cambodian job advertisement pages, you can see that over the past three years, from 2016 to 2019, they have increased by only 2.5%. Which means that in Cambodia the demand for that job is rather low. That's why some of the young people do not actually want to go into that field. But I will tell you how much it will be needed.

Generally those skills are very much needed, but they require a lot of technical skills in the area and we still find it very hard to find qualified people. OK? In Cambodia right now. But these fields—data science, technology as well as digital marketing and business intelligence—the demand in this area is still growing every day. So what does that mean? It means that the jobs in this area are going to be growing for you all. There is growing demand for these jobs. In Cambodia typically we hire some foreigners to do these jobs. But I believe that in the future you are going to replace them.



You see now if you ask a company if they want to engage an expert in business intelligence and data science, generally the expense is US$2,800 per month. But if you engage an expert in Cambodia you have to incur a cost of about US$6,000 a month or so. If you engage a consultant, if you engage a contractor, the cost will probably be double the price per month. If you engage them in this area of data science, business intelligence and digital marketing. So you see, this area is really much needed in Cambodia, now and in the future, if you want to look at that.

So basically the training areas that we need are all the things that young people should look into, including data, architecture, digital marketing, business case management, project management, data analytics, machine learning or artificial intelligence (AI), and software development. So these are the areas that young people may want to look into if you really want to catch up with the trends in this eco-society and ecotechnology.

In YEAC, because we see the gap between what the universities produce and what the industry really wants, the skills that industry really wants, we generally advise our member companies to introduce in-company training. In-company training is systematic training that follows a specific standard in the company, to train existing staff or new staff on certain skills so that the company can ensure stability in production and ensure the continuity and sustainability of the company's operations as well.

So we introduce this idea to our companies. So given this opportunity I would once again like to emphasize that there is a need for collaboration between industry, private sector like us, universities, and of course luckily today we have government representatives from the ministry as well. So we need to work together in order to bring this forward and to make our young people, young labor force, more competitive in this very competitive world. With that, thank you very much for the opportunity once again. Thank you very much and I apologize for any misrepresentation or any inappropriate gesture or anything, Thank you very much indeed for your attention.

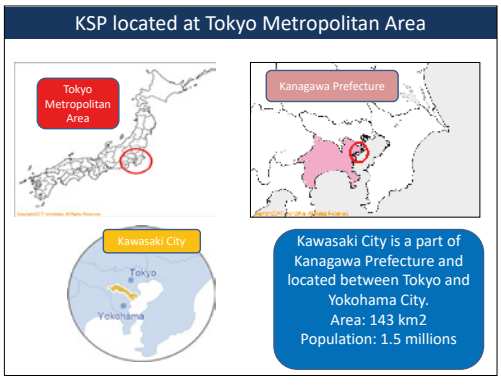
Mr. Kei IINUMA
Incubation and Investment Manager from KSP, Inc.

Session 2

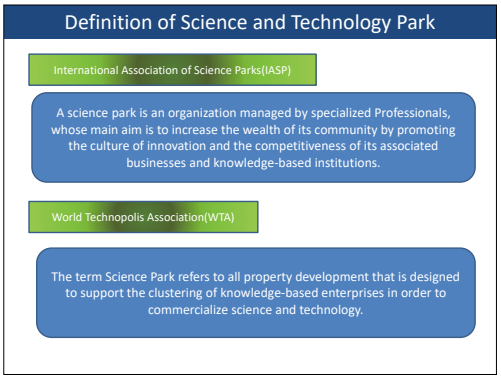
Private Sector Involvement in Human Resource and Career Development for Future Eco-society

Human Resource Development through Japanese Science Park's 30 Years of Accumulated Practices for Kanagawa Science Park (KSP)

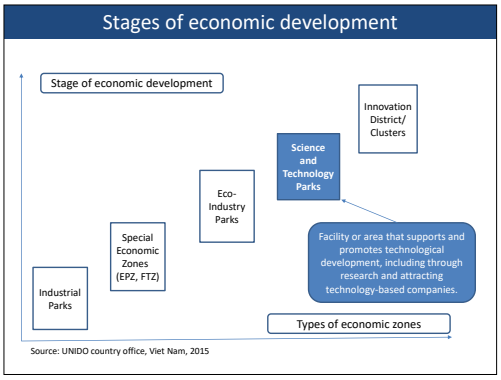
We are from the city of Kawasaki. This is the Tokyo metropolitan area.



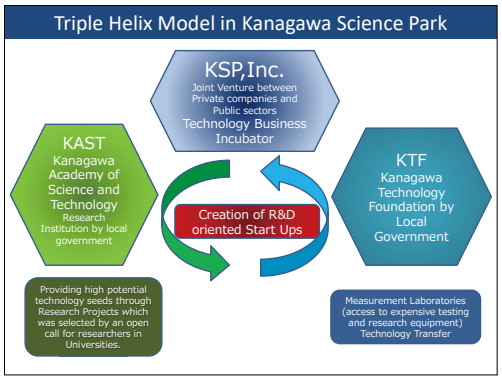
This is Kanagawa Prefecture. Kawasaki is a part of Kanagawa Prefecture. Kawasaki is between Yokohama and Tokyo. Its area is 143 square km, so much smaller than Phnom Penh. But the population is about 1.5 million, very similar to Phnom Penh. 30 years ago few Japanese knew about science parks and business incubators.



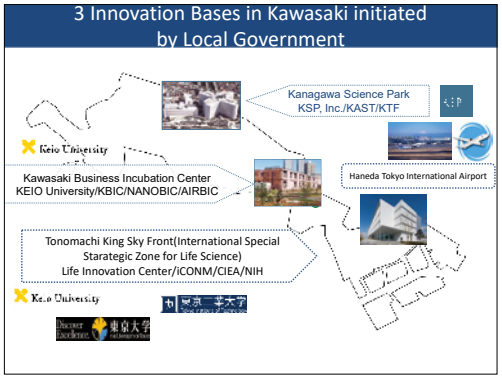
Now here are some definitions of "science and technology park." I like the second one. "Science park" refers to any property development designed to support the clustering of knowledge-based enterprises in order to commercialize science and technology.



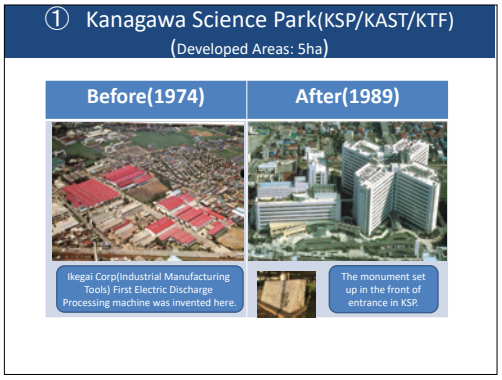
This is a stage of economic development. It's a kind of economic zone. Industrial park, special economic zones such as free trade zones, and eco-industry parks. And here, science and technology park. This is an innovation district and cluster, such as Silicon Valley and, in Japan, Tsukuba City.



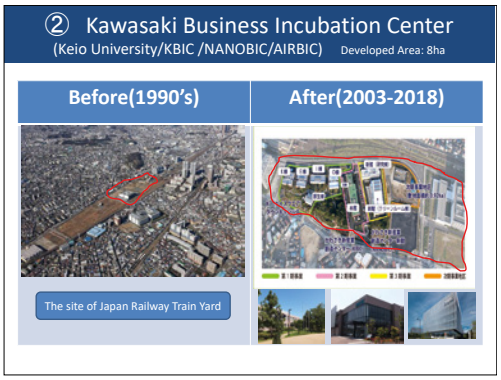
This is a triple-helix model in Kanagawa Science Park (KSP). KSP consists of three different functions or institutions. One is Kast. This function is a research institution providing high-potential technology seeds through research projects. And also, Kanagawa Technology Foundation (KTF). This functions as a measurement laboratory and in technology transfer. KSP Inc. is technology business incubator. So the main purpose is to create R&D-oriented startups.



These are the three innovation bases in Kawasaki. The first is KSP. The second is Kawasaki Business Incubation Center. The third is now Tonomachi King Skyfront (TKS). This is an international special economic zone for life science.

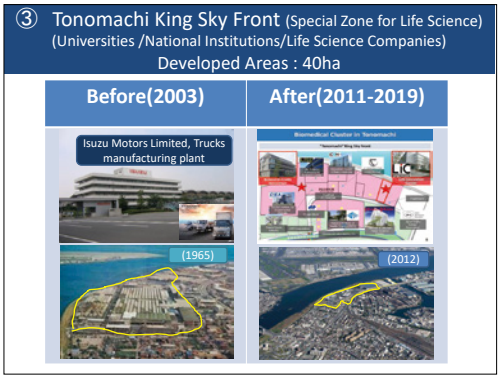


This is before and after. First, KSP used to be a manufacturing plant like this. In 1989 the science park opened, the first science park in Japan.



This is the second one. This was a railway train yard. Now it is a science park like this.

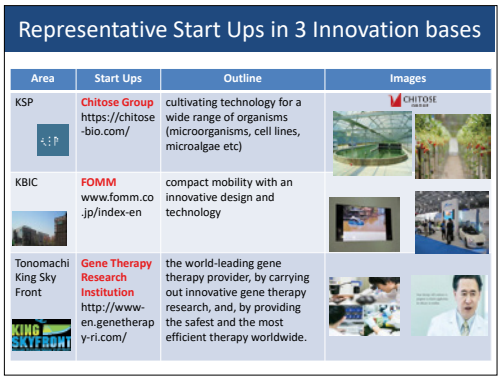
The third one is the TKS special zone for life science related companies and universities. This one used to be an Isuzu Motors truck manufacturing plant.



This is the Tama River, a famous river in Kawasaki. Now it has changed into a life science cluster. TKS is in front of Haneda International Airport. So Tonomachi will be a gateway for Asian life science communities in the near future, I think. So now a bridge between the Tonomachi area and Haneda airport will be completed next year, in the year of the Tokyo Olympics.

These are some representative startups in the three innovation bases. KSP, Chitose Group; Kawasaki Business Incubation Center (KBIC), FOMM. This is a compact mobility business. But FOMM's main target is Southeast Asia. This vehicle is an electric vehicle, but it floats, so it is

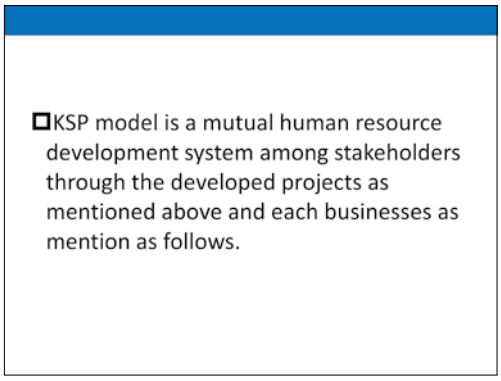
to be used in Bangkok, Thailand, where there are lots of flood. They made a vehicle that can float. Now it is mainly supported by Thailand's central government. This year they started to sell the vehicle in Thailand. And also TKS: Gene Therapy Research Institution. This is also a good startup company.



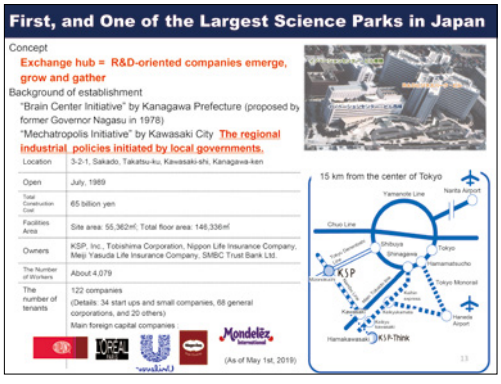
Representative Start Ups in 3 Innovation bases

Area	Start Ups	Outline	Images
KSP	Chitose Group https://chitose-bio.com/	cultivating technology for a wide range of organisms (microorganisms, cell lines, microalgae etc)	
KBIC	FOMM www.fomm.co.jp/index-en	compact mobility with an innovative design and technology	
Tonomachi King Sky Front	Gene Therapy Research Institution http://www-en.genetherapy-ri.com/	the world-leading gene therapy provider, by carrying out innovative gene therapy research, and, by providing the safest and the most efficient therapy worldwide.	

The KSP model is a mutual human resource development system among stakeholders through the development projects as mentioned above and each business as follows.



- KSP model is a mutual human resource development system among stakeholders through the developed projects as mentioned above and each businesses as mention as follows.



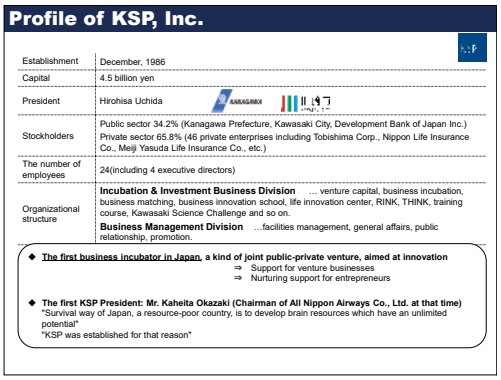
First, and One of the Largest Science Parks in Japan

Concept
Exchange hub = R&D-oriented companies emerge, grow and gather
Background of establishment
"Brain Center Initiative" by Kanagawa Prefecture (proposed by former Governor Nagasu in 1978)
"Mechatropolis Initiative" by Kawasaki City The regional industrial policies initiated by local governments.

Location	3-2-1, Sakado, Takatsu-ku, Kawasaki-shi, Kanagawa-ken
Open	July, 1989
Total Construction Cost	65 billion yen
Facilities Area	Site area: 55,362㎡, Total floor area: 146,336㎡
Owners	KSP, Inc., Tobishima Corporation, Nippon Life Insurance Company, Meiji Yasuda Life Insurance Company, SMBC Trust Bank Ltd.
The Number of Workers	About 4,079
The number of tenants	122 companies (Details: 34 start ups and small companies, 68 general corporations, and 20 others) Main foreign capital companies

15 km from the center of Tokyo
(As of May 1st, 2019)

KSP is the first and one of the largest science parks in Japan. This project is a strategic project initiated by local governments, The number of employees inside it is about 4,000 people, and 122 companies are located here.



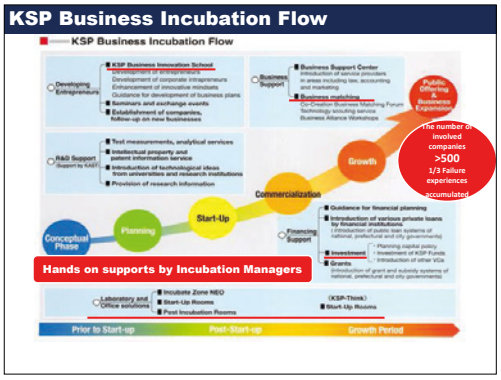
Profile of KSP, Inc.

Establishment	December, 1986
Capital	4.5 billion yen
President	Hirohisa Uchida
Stockholders	Public sector 34.2% (Kanagawa Prefecture, Kawasaki City, Development Bank of Japan Inc.) Private sector 65.8% (46 private enterprises including Tobishima Corp., Nippon Life Insurance Co., Meiji Yasuda Life Insurance Co., etc.)
The number of employees	24(including 4 executive directors)
Organizational structure	**Incubation & Investment Business Division** …venture capital, business incubation, business matching, business innovation school, life innovation center, RINK, THINK, training course, Kawasaki Science Challenge and so on. **Business Management Division** …facilities management, general affairs, public relationship, promotion.

◆ The first business incubator in Japan, a kind of joint public-private venture, aimed at innovation
⇒ Support for venture businesses
⇒ Nurturing support for entrepreneurs

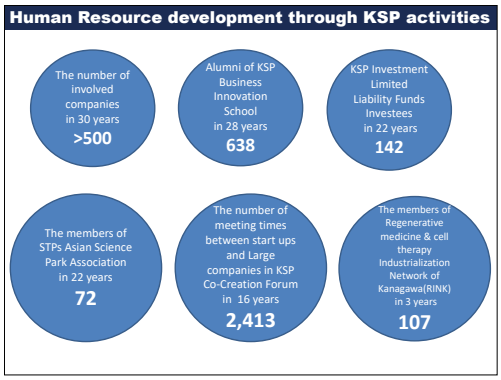
◆ The first KSP President: Mr. Kaheita Okazaki (Chairman of All Nippon Airways Co., Ltd. at that time)
"Survival way of Japan, a resource-poor country, is to develop brain resources which have an unlimited potential"
"KSP was established for that reason"

This is a profile of KSP Inc. We are a joint project. One third of stockholders come from the public sector and two thirds from the private sector.

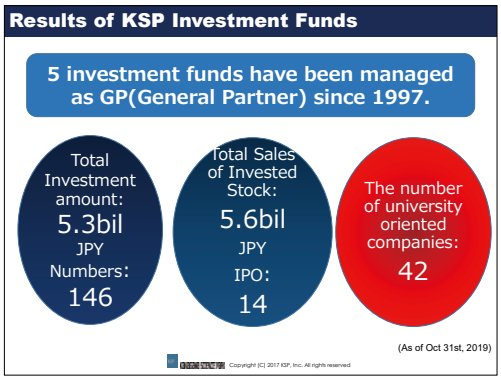


This is the KSP business incubation flow. This is a company like that. So conceptual phase, planning, startup, commercialization and growth. Some companies make an initial public offering (IPO) for business expansion. It takes about 10 or 15 years. Hands-on support by incubation managers takes such a long time together with an entrepreneur.

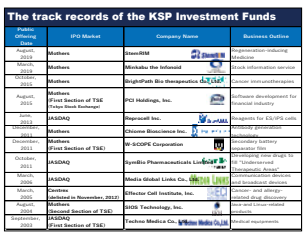
These are the KSP incubation managers with a variety of backgrounds.

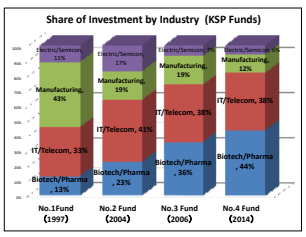


This is human resource development through KSP activities. The number of involved companies in 30 years: More than 500. Alumni of KSP Business Innovation School: In 28 years, 630. This is the KSP Investing Limited Liability Fund. Investees in 22 years: 146 right now. These are the members of the Science and Technology Park Asian Science Park Association. In 22 years, now 72 members. The number of meetings between startups and large companies in KSP Co-Creation Forum in 16 years: More than 2,040. This one is the members of the Regenerative Medicine and Cell Therapy Industrialization Network of Kanagawa (RINK). In three years, the number of members has grown to more than 100.



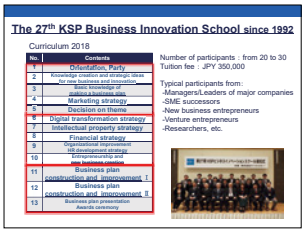
This one says: Five investment funds have been managed as general partners (GPs) since 1997. This is in Japanese yen, but the total investment amount is US$53 million. Now total sales of investment stock is US$56 million. Out of 146 in which we invested, the number of IPOs is 14. The number of university-oriented companies is 42 out of 146.

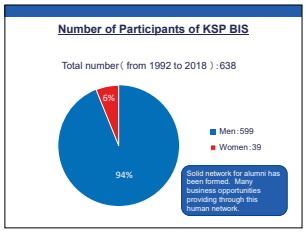




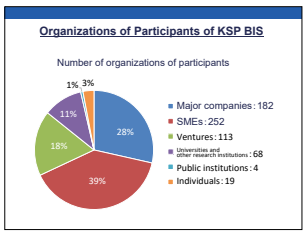
This is the track record of our investment funds. This is share of investment by industry. You can see that biotech/pharma is increasing.

This is fostering entrepreneurs by Business Innovation School (KSP-BIS). Last year we visited Huawei in Shenzhen, China for overseas training.



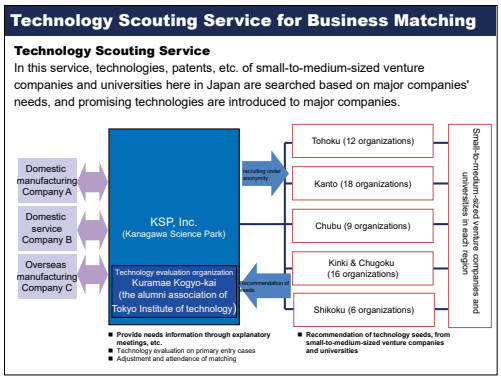


This is a solid network for alumni that has been formed. Many business opportunities are provided through this human network.

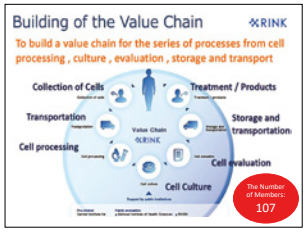


These are the participating organizations in KSP-BIS. 28% come from major companies; 39% are SMEs; 18% are ventures; 11% are universities and other research institutions.

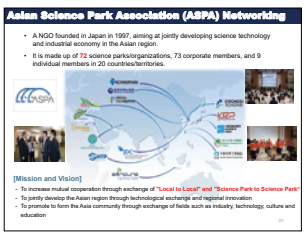
This is the Accelerator Program based on BIS experience. We call it the Kawasaki Deep Tech Accelerator. Now one of the staff of the Chitose Laboratory joined this Accelerator Program.

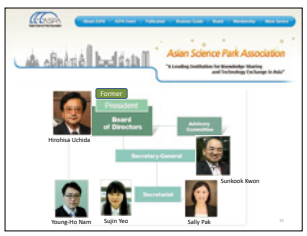


This is a technology scouting service for business matching. This is based on the needs of large companies. We try to find technology from smaller and medium-sized venture companies. Maybe in your country, like Cambodia, these needs may come from social issues or social problems. But I think you can find technologies from the startups to solve the problems.



This is a life science network. Now it has 107 members, but in this slide Hitachi and Sony are not pharmaceutical companies, but they joined our network.



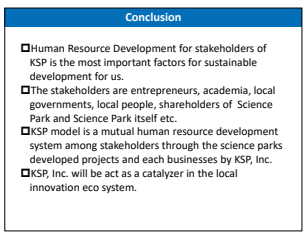


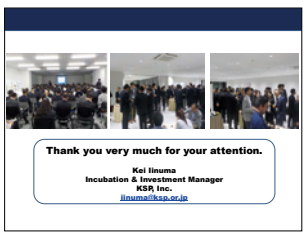
Okay, this is the Asian Science Park Association (ASPA) networking. This is a non-governmental organization founded in Japan in 1997. When it started, its purpose was networking in East Asia, like Korea, China, Taiwan, and Japan. But now it has spread to Southeast Asia and also West Asia. So now its board members are coming from Vietnam (Hoa Lac Hi Tech Park, from Hanoi; Saigon Hi Tech Park) and also from Thailand (National Science Park). These are also members. This is a local-to-local and science-park-to-science-park network.

This is the Secretary of ASPA, located in Daegu, Korea. History of the President: Dr. Hirohisa Uchida is a former President of ASPA.

ASPA was granted special consultative status with the United Nations in 2016. This year ASPA held its 23rd annual conference. Last month, November, it was held in Hsinchu in Taiwan. The president of ASPA is from Hsinchu Science Park in Taiwan.

This was also last year, almost one year ago, United Nations ESCAP, UN ESCAP, invited experts from science parks from Russia, Taiwan, Indonesia, Iran, Korea, Thailand and Japan. This summer—this is a public issue. Establishing Science and Technology Parks: A Reference Guidebook for Policymakers in Asia and the Pacific. So, you can refer to this guideline.





Conclusion: Human resource development for stakeholders of KSP is the most important factor for sustainable development for us. The stakeholders are entrepreneurs, academia, local governments, local

people, shareholders of the Science Park and the Science Park itself. The KSP model is a mutual human resource development system among stakeholders through projects developed by the science parks and each of the businesses of KSP, Inc. KSP, Inc. will act as a catalyst in the local innovation ecosystem.

OK, thank you very much for your attention.

DAY 1

Panel Discussion Following Session 2

Dr. Hirohisa UCHIDA, Moderator, Executive Director of HOF, Distinguished Professor, Tokai University/President and CEO, KSP Inc.

Mr. Hong Kok CHEA, Director of Macroeconomic and Fiscal Policy Department, Secretariat, Entrepreneurship Development Funds, the Ministry of Economy and Finance

Dr. Tomohiro FUJITA, Founder & CEO of Chitose Group/(Member of Bioeconomy Strategy Council, CABINET SECRETARIAT)

Mr. Sopagna SEANG, Vice-President of Young Entrepreneur Association of Cambodia

Mr. Kei IINUMA, Incubation and Investment Manager from KSP, Inc.

Panel Discussion Following Session 2

HU: Before starting, I want to shortly introduce myself. I've been in University around 40 years long and I've been involved in government-academic collaboration started in the 80's in Japan. The government provided funding for academic research, but when the research was done and the report was submitted, its story came to an end. Academic studies should benefit the public, as the money for them comes from taxpayers. In this sense, I myself think starting a venture company or new industry is very important. For example, Kanagawa Prefecture, in 1980's. That local government started to fund to launch a Science Park for the first time in Japan, that was Kanagawa Science Park. In that light the development of venture businesses as a result of academic studies is highly positive and encouraging. Kanagawa Science Park (KSP) achieved such results, giving rise to over 500 venture companies over 20 years, 40 of which became especially successful. I think starting a venture or a company is very important. This is the background against which to frame the forthcoming panel discussion.

Question: What is important for starting a venture company?

HKC: In the capacity of a director of the entrepreneurship development fund (EDF), I think an entrepreneur is a person who sees an opportunity to innovate and brings that opportunity to the market.
Many entrepreneurs fail in this process, for the following reasons:

1) Ability to spot opportunities is not sufficiently refined due to **lack of mentorship**. About half of entrepreneurs lack mentorship. Often this is a cultural problem, as beginning entrepreneurs are wary of sharing their ideas, then when they gain some success their ego prevents them from seeking mentorship.
2) Ability to innovate is hampered by **lack of networks**. Government has a duty to create mentorship networks and platforms so entrepreneurs can prosper.
3) When the innovation is brought to market, different skills come into play, including managerial, fundraising and HR skills.

HU to HKC: Why are you working in government instead of starting your own company?

HKC: I consider myself not an official but a **policy entrepreneur**. I am "testing the product," developing the network and then seeking funding. Japanese investors are interested in Cambodia; my job is to build infrastructure to lower investor risk.

SS: First, understand the market, so you can recognize unsolved problems, find ways of solving them or doing things cheaper or easier. Second, young entrepreneurs

need mentorship as they lack knowledge and experience. They need three "sets" to start a business:

1) **Mindset:** Passion, correct identification of the problem, knowing that you can address the problem
2) **Skillset:** Skills to address the problem, which may be leadership, managerial skills, technology skills, people skills, etc.
3) **Toolset:** Team members, peers and other resources to conquer the market and sustain the business

Young entrepreneurs should not fear failure. Even failure is valuable because it teaches lessons. Young people can pick themselves up and start again.

TF: Starting a business brings **hardship**. It is hard, every day, every moment. Once you start you can't stop, because employees and their families also depend on the success of the venture. Many says passion is very important, but what is passion? I think **Passion** comes from what kind of society you want to make. Passion is the ability to see the changes in society that create opportunities and the determination to capture those opportunities by solving problems. The hardship and passion of starting a business are always in conflict; there will be times when an entrepreneur wants to quit but knows she cannot.

KI: Most important factors are:

1) The spirit of **never giving up**
2) Understanding of **needs:** customer needs, society's needs and who is really paying for their product or service

Questions from the audience

Q1: For entrepreneurs who need skills in multiple disciplines but do not have all of those skills personally, how can they network and find the people they need?

TF: Entrepreneurs should not try to do everything alone. They need to clarify what they can do themselves and what they cannot do themselves and so need others to do for them. When entrepreneurs are clear about that division, they can find others to fill other roles easily and spontaneously.

HKC: The need to differentiate roles is common to every field. Every entrepreneur needs a team. When the venture becomes successful one shares the hard work with the team.

HU: Find your strongest point.

Q2: How to find and recruit a team?

SS: To assemble a team, an entrepreneur needs:

1) People with the same passion
2) A good business model: Conduct SWOT analysis and make sure all members understand and agree on the analysis and the business model.

Ensure the two things above and the venture will be in a good starting position.

DAY 1

Wrap-Up Panel Discussion

Prof. Tateo ARIMOTO, Moderator, Executive Director of HOF/Visiting Professor, National Graduate Institute for Policy Studies/Principal Fellow, CRDS at Japan Science and Technology Agency (JST)

Dr. Chan Oeurn CHEY, Vice Dean, Faculty of Science, RUPP

Dr. Tomohiro FUJITA, Founder & CEO of Chitose Group/(Member of Bioeconomy Strategy Council, CABINET SECRETARIAT)

Mr. Hong Kok CHEA, Director of Macroeconomic and Fiscal Policy Department, Secretariat, Entrepreneurship Development Funds, the Ministry of Economy and Finance

Dr. Junichi TAKADA, Professor and Vice President for International Affairs, Tokyo Institute of Technology

Participants:
Prof. Tateo Arimoto, moderator (M)
Dr. Chan Oeurn Chey (COC)
Dr. Tomohiro Fujita (TF)
Mr. Hong Kok Chea (HKC)
Dr. Junichi Takada (JT)

Wrap-Up Panel Discussion

STEM Human Resource Development for Next Generation

This panel discussion started with Dr. Junichi Takada's presentation of STEM education through laboratory experiments.

JT: I am Professor and Vice President of International Affairs at the Tokyo Institute of Technology, or "Tokyo Tech," an institution equivalent to the Institute of Technology of Cambodia (ITC). Previously, from 2011 I was involved in a project to enhance STEM education through laboratory experiments. The following discussion is a description of a JICA project on lab-based education (LBE) with which I am involved at ITC implemented since this year.

LBE is a model followed in Japan in graduate science studies as well as in the final year of undergraduate science studies. In engineering education, imparting knowledge without practice is inefficient. Hence LBE provides a more effective approach for this purpose than classroom education.

In LBE, an engineering research team is headed by a lecturer or professor, with the university often providing the facilities and funds. The key here is interaction among team members, headed by a Principal Investigator (PI) and with a hierarchy of researchers in various years (freshman, sophomore, Master's, doctoral, etc.). Students gain valuable learning from mentoring of each other and by the PI.

Without LBE, researchers work independently on thesis work, often going off-campus on research internships, with occasional supervision by the PI. This approach has the disadvantage of weak interaction between the PI and each student and none between students. It was formerly used at ITC but students had difficulty graduating.

LBE can be viewed as a kind of project-based learning (PBL). It is a hands-on approach that enables direct transfer of skills through experiments and lab work.

LBE also supports maintenance of lab facilities, since facilities are continually used with knowledge transfer.

LBE is also scalable: It is possible to start with limited facilities and smaller groups and gradually add facilities and move onto larger groups.

The JICA/ITC project aims not to impose a Japanese model on Cambodia but to find an approach that suits Cambodian needs. In addition to ITC, JICA is working with the University of Battambang and Svay Rieng University.

M: Educational framework of Cambodia
Brief canvas to ask how many students are in engineering and how many are in social science and humanities (SSH).

Two or three years ago the Cambodian government introduced the **rectangular strategy** and **Cambodian industrial development policy.**
Rectangular strategy consists of:
1) First priority is human resource development.
2) Second is economic diversification.
3) Third is private-sector and job development, including startups.
4) Fourth is inclusive and sustainable development.

Human resources are the first priority because 2), 3) and 4) above all require competent people: policy, management, working, executive and research people. "Human resource development" encompasses education, science and technology, technical training, and public health and nutrition.

Every sector, both private sector and public sector and all levels of government from national to local, requires working beyond boundaries: combination of engineering with SSH; both genders; across generations; and across national borders.

History is important, to be knowledgeable about the challenges each country faces. For example, Japan's modernization and industrialization; Cambodia restarted from almost zero 30 years ago for next generations.

Question for panel: How to reform/improve the education and evaluation systems?

COC: New government began in 2013 and Royal University of Phnom Penh (RUPP) is working with the Ministry of Education, Youth and Sport on the international development program (IDP) of the government of Cambodia to make Cambodia a higher-income country. Work includes: K-12 curriculum, adaptation to STEM education amid changing technology, development of curriculum framework.

RUPP is also reforming to serve the needs of industry, due to a skills mismatch identified in a study in 2015. The approach is to integrate the RUPP curriculum with government priorities. Funding for reform is provided by the World Bank. RUPP is in the process of transforming from a teaching university to a research university. So both general education and university education are being reformed in Cambodia.

JT: Tokyo Tech reformed its education system three years ago, after 70 years essentially unchanged. One feature of the reform is increased emphasis on the liberal arts. Most students at Tokyo Tech major in science and engineering but Tokyo Tech is introducing liberal arts from the undergraduate to doctoral levels. The reason is that at the doctoral level, Tokyo Tech suffers a mismatch between skills taught at the university and those required by industry, as Cambodian universities do. Interaction with society and people is important, so Tokyo Tech is exposing its students to more opportunities. Though it is at an early stage, three years after the reform, the introduction of liberal arts seems to have had a positive effect, as science and engineering students begin to look at various issues rather than the narrow requirements of a science and engineering degree.

M: Tokyo Tech is a leading university in Japan and the world. It's the "icebreaker" for the shift toward liberal arts education.

Education is not only about transfer of knowledge but also about fostering entrepreneurship.

Question for panel: How can entrepreneurship be integrated with universities?

HKC: The MOF approaches reform from the perspective of finance. Reform has short-, medium- and long-term windows. In the short-term, reform must be transparent and understood as urgent. Longer-term it is a cultural change, moving toward an orientation to entrepreneurship by integrating the curriculum with entrepreneurship. In the beginning, reforms should be small, modestly funded, experimental and tolerant of failure. Examples include promotional campaigns and pilot projects. After errors are corrected and the process is well run, reform can be scaled up, including requests for further funding.

M: The context of reform is not static but constantly moving; technological changes (Big Data, AI and digital transformation) and cultural changes (some people talk of a "post-truth era," etc.).

TF: In conventional education, the rules for education are evidence-based. But in entrepreneurship-oriented education, institutions should make their own rules, adjusting for changing circumstances. This is a 180° change in direction.

Questions from the Audience

Q1: The focus is on STEM to make Cambodia a rich and developed country. But what is the point of having STEM if the country is unhappy?

JT: STEM education and universities enable economic development, which gives people the means to pursue their personal and life goals. They do not guarantee a particular outcome; rather, they broaden the range of opportunities and possibilities for individuals. It is for each individual to find their own direction to pursue happiness. For example, 5G research, which began 10 years ago, opened a field of possibilities but the end result is only becoming clear now.

Q2: Speaker was a 2009 Y-E-S Award winner and is now a lecturer at a university in Laos. Some students are enthusiastic but others are more apathetic. How to inspire students who are currently less motivated?

COC: Teaching with whiteboard and textbooks will put core students to sleep. First, link education to the real world, to everyday life. Find science all around you. Second, shift focus to activities rather than textbook learning. There are many methodologies: Problem-based learning: Students tackle a problem, go out to find answers, then come back to the class to present. Third, collaboration between academia, industry and government is very important.

HKC: At the start of classes, ask the students why they are there. Ask what they hope to get from the class. Encourage interaction about students' personal goals.

TF: There will always be some people who cannot be inspired. Instructors can do their best to inspire those who want to be inspired, but inevitably some will remain unmotivated.

M: Linking education with entrepreneurship requires not only knowledge but also passion.

Question from M to COC: Please describe your program.

COC: I am a physics instructor at the Faculty of Science of RUPP. I also train Cambodian national student teams for international physics competitions such as the International Physics Olympiad. Gifted students are easy to teach. The International Physics Olympiad involves intensive problem-solving, requiring analytical skills. This requires not only scientific knowledge but also linkage with 4C and the flexibility to identify and solve problems. In another program, I train students for international research competitions. In this program the students stay for several months, learning how to do research and how to apply research. Students have widely varying backgrounds, levels of motivation and behaviors. I teach them 3H: Head (critical thinking), Hand (learn the practical work that has to be done by hand) and Heart (aim to contribute to society).

M: Each speaker is invited to give a one-minute closing comment.

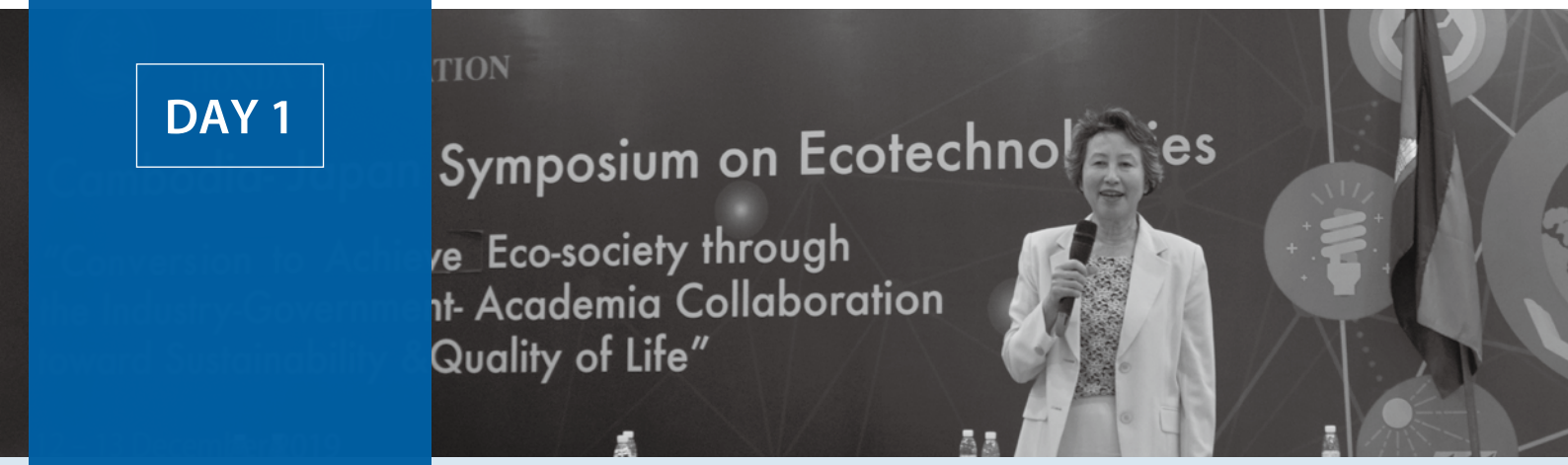
HKC: Embrace challenge. Do not fear failure.

TF: Education and experience must interact. Education informs experience and experience informs education.

JT: Interact with a wide range of people, outside your normal circle of contacts. Education provides opportunity; how the individual grasps that opportunity is in the hands of the individual.

M: The purpose of STEM education and development of human resources for the next generation is to enhance sustainability and quality of life.

DAY 1



Closing Remark

Dr. Kazuko MATSUMOTO, Executive Director, Honda Foundation

Dr. Kazuko MATSUMOTO
Executive Director, Honda Foundation

Closing Remark

Thank you very much. We now are finishing this very important, attractive and stimulating symposium. First of all I'd like to thank all of the participants, all the speakers from the Cambodia side and all the speakers from Japan and the young participants in the audience. Thank you very much for making this symposium so successful. Many speakers have already talked about the importance of an "eco-mind" and sustainability. Maybe I don't need to say more words, but I'd just like to say something about today's symposium. Soichiro Honda, the founder of Honda Motor, left us these important words, "ecotechnology" and "eco-society," many years ago. Maybe at that time the importance of ecotechnology was not mentioned by many people in the world. But he had a very foreseeing mind. So he left us the importance of these words. These words show Soichiro Honda's excellent ability to foresee the future. Maybe he at that time already noticed the importance of sustainable technology. Today's two speakers from the Cambodian side also stressed the importance of this sustainability and eco-mind, in different words. But I didn't expect before I joined this symposium that the speakers from the Cambodian side would recognize the importance of spiritual attitude toward sustainability. I'm very impressed about that. The second thing I'd like to say is about the involvement of young people in ecotechnology and raising entrepreneurship. I feel a kind of envy for Cambodia because you have more and more young people. I hear that your population maybe will be doubled in 10 years or 20 years. That is totally different from Japan, we are now suffering a decreasing population. Cambodia has a very bright future because you can expect a larger and larger market, you will expand your commerce and agriculture and many fields. I know that in order to develop such commerce, as well as education and many other fields, young people need to remember two important factors. That is: Dr. Nakamura talked about Japan's past. He said that Japan was a miracle in Asia, but unfortunately that's no longer the case. So Cambodia is becoming a miracle in Asia, and in order to realize that, young people have to be diligent and hard-working. These are two factors Japanese young people used to have. Well, I hope they still do! But these two factors were really the cause of Japan's big success in the past. So thank you for a very interesting symposium.

DAY 2

Opening Remark

Dr. Mitsunobu KANO, Executive Director of HOF/Vice Executive Director and Professor, Okayama University/(Science and Technology Co-Advisor to the Minister for Foreign Affairs)

Dr. Mitsunobu KANO
Executive Director of HOF/Vice Executive Director and Professor, Okayama University/(Science and Technology Co-Advisor to the Minister for Foreign Affairs)

Opening Remark

I'd like to give three points to open today's discussion. The first is my motivation to work with Honda Foundation and some of my own related experience. The second is how we can "become together." And the last is how we can continue to "go together."

First, I would like to share you my motivation. Honda Foundation's motto is "Ecotechnologies." What is this? Have you ever thought about it? It is the balance between the human dimension and the natural dimension. To do natural sciences, we tend to treat objects outside ourselves, rather than those inside ourselves. Let's imagine water as an example. Water, H_2O, is the same for all. However, things like thoughts inside us can be quite different sometimes, and therefore really hard to be treated with the scientific way of thinking. This may be the reason why humanities and social sciences may seem more complicated than natural sciences. The word "STEM," which Arimoto-*sensei* asked you a lot yesterday, relates more to natural sciences, which are easier to understand because objects are outside of us. However, to balance between the human dimension and the natural dimension, we need to think how to combine the two: not only dealing with something outside of us, but also thinking about what being inside us. This is the point of Honda Foundation's motto, in my view.

Why did I come to think so? To explain the reason, let me share you some of my related experiences. I started my professional career as a clinical medical doctor. Practicing medicine requires an education at a medical school, in which we are first trained to focus on material side of ourselves. In other words, you may start from anatomy, which makes you to focus on what is happening in bodies not alive anymore. Dead bodies are almost just material, not spiritual anymore. We therefore are trained to see the material side of humans in order to practice medicine. This is the Western way of practicing medicine. Once you come to the clinical setting, however, you may need to encounter the "raw humans." "Raw humans" have both a material side and a spiritual side. Especially when we become ill, we may feel something different from what we feel from our daily life. You may feel you are weaker, and therefore sometimes feel that you are losing in your life. But are you truly losing? I think you are rather winning by acquiring such a new sight on the world which is quite different from healthy life. You may consider how you can bridge your activities to the next generation, especially when you are dying. This is a great motivation towards education. I met someone who had suffered from terminal cancer: She was only 24 years old. She was so successful before her illness, from a point of view in which she had a good job at a trading company. However, after learning that she was terminally ill, her way of thinking seemed to have changed considerably as I mentioned. It was unforgettable to meet such a young dying person suffered from a disease not treatable anymore, especially as a medical doctor who needs to play a professional role. You can do almost nothing professionally, except for listening to her. Scientific knowledge was the source of the profession. Therefore, I felt a powerless side of science. Science is something by which we generalize observations, and therefore applicable to numbers of people similarly. But, individual ways of thinking, including "spiritual pains" as in this case, are sometimes unable to be generalized. With these episodes I wished to emphasize the need to think about these limitations, if we wish to balance between the human and natural dimensions.

After the experiences, I felt that practicing medicine almost consisted of routine works, in a sense. And I wanted to try something new. That's the reason why I quit clinical medicine and became a scientist. Science is an activity where you can express your creativity through the process of finding clues or evidence to support your ideas: although it has the limitations I mentioned previously. Finding new clues is the way to make your new idea more credible. This "credibility" is important. Once you wish to share your new idea, to involve more

people going together with your new idea, you need to persuade other people. Being persuasive means being able to convince others that your new idea is correct. But how can you do this? By gathering evidences. I think this is a nice way of explaining why the scientific way of thinking is important.

In this way, I am also doing education. And if education cannot inspire you, I still believe that education can motivate you to do something new. I still believe in the power of education, as the way to develop each other as humans.

Now, for the next topic I wish to cover, I would like to share my recent experience involved in diplomacy. What is diplomacy? According to my recent thoughts, diplomacy has three factors. One is to improve our wealth. Another is to improve our security, which is not only defense but also food, water, energy and so on. And the last is to improve our attractiveness, or, differences. The reason why we attract each other is that we are different. Right? In Japanese culture we tend to conform, but this may not improve our attractiveness. I'm afraid it might be somehow similar here, but finding out where we are different is really important, as we discussed yesterday. To cope with other people, we need to think about our own limitations, so we can collaborate with other people. So thinking about differences is really important, to think about our own attractiveness. From this point of view please find out where we are different and what traits we share. Collaborate we can with a shared aim, but for the shared aim we need to actively utilize our own differences.

Now, we come to the last topic "going together." I think it's nice for you younger students to look at how you can study in Japan. From this point of view, you have a lot of great colleagues here in this audience today, including the Cambodia-Japan Cooperation Center (CJCC). Please raise your hand if you are a member of CJCC. Ah, there! She should be able to translate what you ask into Japanese, too. And she used to work at Honda Foundation as well. Also, my university, Okayama University, is now in charge of promoting studying in Japan from ASEAN countries recently. If you want to find out more, please look up some key phrases such as JASSO, which stands for "Japan Student Services Organization," for study in Japan or academic seminars; or visit the CJCC Facebook page.

With this I would like to start today's session, which I will moderate from now. Thank you very much!

DAY 2

Panel Discussion Following Session 1 (Day 1)

Dr. Mitsunobu KANO, Moderator, Executive Director of HOF/
Vice Executive Director and Professor, Okayama University/
(Science and Technology Co-Advisor to the Minister for Foreign Affairs)

Dr. Akinori MORIMOTO, Professor, Waseda University, Faculty of Science and Engineering/
School of Creative Science and Engineering

Dr. Shizuo IWATA, Chairman, ALMEC Corporation

Mr. Thanh Yen LE, Y-E-S Vietnam 2015 Awardee

Mr. Satyam MOHLA, Y-E-S India 2017 Awardee

Dr. Monorom RITH, Y-E-S Cambodia 2012 Awardee

Mrs. Thipphamala MANIVONG, Y-E-S Laos 2009 Awardee

Ms. Suu Malar WIN, Y-E-S Myanmar 2016 Awardee

Mr. Mony SOEURN, Student Year 4, Department of IT Engineering, RUPP

Mr. KimAng KHEANG, Graduated Student 2019 from Department of IT Engineering, RUPP

Ms. Chhengkeang LY, Student Year 3, Department of IT Engineering, RUPP

Mr. Kimhong SAM, Student Year 4, Department of Telecommunication &
Electronic Engineering, RUPP

Ms. Channtha SUM, Student Year 4, Department of Tourism, RUPP

Ms. Kakruna OUK, Graduated Student 2019, Department of Bio-Engineering, RUPP

Ms. Somethea TANN, Student Year 4, Department of Media & Communication, RUPP

Participants:

Dr. Mitsunobu KANO, moderator (M)
Dr. Akinori MORIMOTO (AM)
Dr. Shizuo IWATA (SI)
Mr. Thanh Yen LE (TYL)
Mr. Satyam MOHLA (SM)
Dr. Monorom RITH (MR)
Mrs. Thipphamala MANIVONG (TM)
Ms. Suu Malar Win (SMW)
Mr. Mony SOEURN (MS)
Mr. KimAng KHEANG (KAK)
Ms. Chhengkeang LY (CL)
Mr. Kimhong SAM (KS)
Ms. Channtha SUM (CS)
Ms. Kakruna OUK (KO)
Ms. Somethea TANN (ST)

Panel Discussion Following Session 1 (Day 1)

Inclusive and Sustainable Smart City

M: Topic is "Inclusiveness, Sustainability and the Smart City." We need inclusiveness to make use of our differences and sustainability to connect with future generations. In "smart cities," "smart" can be defined as "using computers to act in an independent way" or "intelligent or able to think quickly in different situations." Both definitions may be relevant to today's discussion.

Questions for consideration:
Q1: How can final goals be set in terms of "Inclusiveness, Sustainability and the Smart City"?
Q2: What can be the first steps toward that goal?

SMW: "Smart" in the "smart city" context means making life easy by using technology and integrating ICT into daily life. Sustainability consists of three pillars: Social, economic and environmental. For Q2, know the real demands of the local population. A smart city in Myanmar or Cambodia will have different needs than one in the United States or Germany, because of differences of level of development and of local people's needs. On Q2, final goal should be sustainability in the local context.

TM: On Q1, older and younger people should merge to find a common goal, because they have very different perspectives and experiences, for example, generations XYZ versus people who grew up during the Indochina wars. The government should assist in this process.

TYL: Even within the same country, smart cities can have different priorities. For example, citizens of Da Nang want connections between the public and managers, focusing on trash and recycling management, whereas in Ho Chi Minh City the people have other concerns including data-driven issues. Also, because different cities have different problems, they will work with different companies, but working with different companies means they each have different systems that do not always mesh together. Standard, core systems are needed so everyone can connect. Goal should be a "smart nation" in which people can expect the same services everywhere. Young people should solve everyday problems first, referring to local city plans.

SM: Smart cities are not just about connecting devices but about connecting people together. If devices can do routine tasks for us, we will have more time to get to know our neighbors better. A smart city can also increase inclusiveness. For example, autonomous vehicles can improve mobility for elderly people. Smart cities can do

many things, so people should clarify their expectations and goals. On Q2, young people can start by looking around them and solving the problems nearest them.

MS: On Q2, government should encourage the private sector to collaborate on sustainable smart cities, addressing issues such as waste management and traffic. Officials in local communities should provide input on how to provide sustainability and accessibility in their own communities. Plans should include human resources, because smart cities need not only smart technology but also smart people. Education is a necessary part of Cambodia's progression toward smart cities.

CL: A smart city is an urban area that uses its systems efficiently. A smart city can only be sustainable if the people who live there are the ones who created it. To be sustainable, a city must be competitive: It must be attractive to investment; it must lift people out of poverty by providing the services (water, sewerage, electricity) they need. Finally, the city must be a great place to live, work and play, because when people are happy their productivity improves.

CS: A smart city is a city supported by technology, innovative solutions and smart people. All stakeholders should pay close attention, including public sector, private sector and private citizens. Cambodia has many problems from rapid urbanization which require education and law enforcement. Human resources (smart people) are needed. Education is needed to teach people how to make Cambodia successful through sustainability. Policy announcements about automobile codes, water, waste, traffic, etc. are ignored by the people because they are not enforced. Everyone should pay attention and work on these problems. New projects, including government ones (a Ministry of Interior building, in this example), are built in violation of the law and not explained to the people. Poor planning discourages investors. City planners hand out building permits to builders like candy. Zoning is either nonexistent or unenforced, so plants are built next to houses, creating an unsightly appearance. However, all problems can be solved and Phnom Penh can be made into a smart city if everyone joins in.

M: Like in a marriage, we should change ourselves before demanding change in others. Stakeholders should improve themselves at the same time as they demand better performance from public servants.

KAK: A "transformation plan" is required. Before educating the people how to use a new smart technology effectively and efficiently, a "transformation step" is needed, in which citizens can simply be provided with the technology so they can learn how to use it on their own without being educated about it. This step, now often overlooked, is how new technology was introduced in earlier times, when there was no infrastructure.

M: What are your next steps, personally?

KAK: Raise awareness among the young. Conduct surveys among those closest to the problems, in the slums, in rural areas, in the cities and so on, to ask what the committee can do to achieve development, what they expect of services, that will make their lives better.

KS: A city is a densely crowded place; a smart city is a city that is full of intelligence and high technology. Building a smart city is difficult. Government should focus on IoT because of the central role it plays in smart cities.

MR: The "smart city" concept is vague but one aspect is the use of IoT, gathering data from multiple devices and analyzing it to develop policy and manage assets, resources and services, to conserve energy, reduce emissions and make the city greener and more comfortable. The aim of that policy should be sustainable development, which is one of the 17 SDGs. To upgrade a city into a smart city, it is necessary to develop resources such as STEM education. However, philosophy must be remembered also, to guide scientists' directions. Smart cities also need smart policymakers, who are knowledgeable about ICT as well as philosophy, so they can guide investment in ICT wisely. Smart policymakers must have full opportunity to make good policies.

M: Summary of young people's comments: Smart cities should connect differences, meaning people of different cities, generations, populations and sectors. Outcomes are education, waste management, attractiveness of the city, job security, and so on.

Audience Questions and Comments

AQC1: First step is to provide knowledge to the younger generation. When studying in Japan, for example, the student learns not only technical knowledge but also Japanese ways of doing things. In Japan even kindergarten children can do quite complex tasks. So awareness of the younger generation is vital.

AQC2: Talking about the words "smart," "intelligent" and "sustainable" from a machine-learning perspective: "Smart" as in "smartphone" means the functions in a device can be used effectively. "Intelligence" means an ability to make good decisions. So a smartphone is smart but not intelligent, and a smart city is a city in which all resources can be used effectively, for example one in

which transportation is available, energy-efficient and environmentally friendly. This smart performance leads to sustainability: A sustainable country is one that can develop quickly without using lots of resources. Finally, the smartest thing is to change oneself to be a smart person, one who handles waste properly instead of dumping it on the street, etc.

AQC3: One speaker said that Vietnam cities that become smart cities become independent in a sense from the rest of the country, so those differences need to be reduced. In Cambodia, there is great disparity in development between the cities and the countryside. Those disparities should be eased before smart cities are introduced.

M: Asks if anyone can expand on Q3's point later.

AQC4: The notion of the smart city is picturesque and futuristic in a Hollywood way, but it is also one of convenience and sustainability. A smart city is a city where both technology and people are smart and is the same as disruptive change.

TM: Regarding Q2 (first steps), first set up the city platform according to priorities in one's local area (transportation, infrastructure, communication, etc.). After that, it will be easier to set up a smart city in a new or rural area rather than in an existing city, because existing cities already have their own setups. Once that is done, people need to be connected to the smart city and be educated about it, spreading awareness from younger to older generations.

M: How would you consider implementing smart cities using the attractions/advantages of your country (Laos)?

TM: Laos is beginning with transportation, for example, with apps for monitoring buses. This involves a lot of cameras and IT and so is expensive, but the plan is just starting and hopefully will be successful.

M: Laos should advertise its many attractions to the world. Suggestions regarding concrete steps would be welcome.

TYL: Five years ago I had a problem: I didn't know what time the public bus would come and I didn't know the routes. I solved these problems by creating an app. It is only now, five years later, that I realize that was a "smart city" solution. So small, local problems should be solved first; later they can be connected together into the larger smart-city framework.

KAK: The term "smart city" contains several components. For example, Phnom Penh has terrible traffic problems. It takes a long time to get around by motorcycle. This is because public transit is poor and the public does not trust it, so every family has multiple cars and scooters instead. More investment in public transit is needed, but this alone does not guarantee a solution. For example, there is a big problem in Paris, because the trains are very crowded. People driving a car alone create a problem, because it takes up a lot of road space. In Malaysia, one solution is a car-sharing program, in which drivers are encouraged to take along others going to nearby destinations.

Senior Panelists

SI: City development is like medicine: The first step is diagnosis of the problem. City problems are interrelated, which makes them difficult to solve. The next step is to envision where one wants to be (ideal or target state). Think of specific goals, not buzzwords. The third step is to decide how to get to the target state. The process must be assessed regularly. The development of ICT helps enormously. As wide a range of stakeholders must be involved as possible. Big data must be analyzed; this may be the role of government. This analysis will guide the progress of the project.

M: So, solutions are driven by data. And the data is gathered from the public, which means public buy-in is essential.

AM: What is an "inclusive, sustainable smart city"? Students offered various opinions. Computer graphics are often used in planning because they make it easy for designers to consult with city planners frequently to ask how the plan can be refined and improved. The process continues until the final version is published. We need to ask each other what our dreams are, so we can establish common goals.

M: Thank you very much for all your comments in this session.

DAY 2

Panel Discussion Following Session 2 (Day 1)

Dr. Nobuko KAYASHIMA, Moderator, Senior Vice President of Japan International Cooperation Agency (JICA)/Honda Foundation International Committee Member

Dr. Nguonly TAING, Executive Director, Techo Startup Center, Ministry of Economy and Finance

Mr. Kei IINUMA, Incubation and Investment Manager from KSP, Inc.

Dr. Junichi TAKADA, Professor and Vice President for International Affairs, Tokyo Institute of Technology

Dr. Ngoc Do Quyen CHAU, Y-E-S Vietnam 2011 Awardee

Mr. Sai Uttej KODURI, Y-E-S India 2018 Awardee

Ms. Sothearath SOK, Y-E-S Cambodia 2018 Awardee

Mr. Leego VANH, Y-E-S Laos 2012 Awardee

Ms. Pwint Phyu THANT, Y-E-S Myanmar 2017 Awardee

Ms. Lyheng PHAN, Student Year 3, Department of IT Engineering, RUPP

Ms. Darinah Pich LEANG, Student Year 4, Department of Tourism, RUPP

Ms. Monysolida SAN, Student Year 4, Department of Bio-Engineering, RUPP

Ms. Kakruna OUK, Graduated Student 2019, Department of Bio-Engineering, RUPP

Ms. Somethea TANN, Student Year 4, Department of Media & Communication, RUPP

Participants:

Dr. Nobuko Kayashima, moderator (M)
Dr. Nguonly Taing (NT)
Mr. Kei Iinuma (KI)
Dr. Junichi Takada (JT)
Dr. Ngoc Do Quyen Chau (NDQC)
Mr. Sai Uttej Koduri (SUK)
Ms. Sothearath Sok (SS)
Mr. Leego Vanh (LV)
Ms. Pwint Phyu Thant (PPT)
Ms. Lyheng Phan (LP)
Ms. Darinah Pich Leang (DPL)
Ms. Monysolida San (MS)
Ms. Kakruna Ouk (KO)
Ms. Somethea Tann (ST)

Panel Discussion Following Session 2 (Day 1)

Private Sector Involvement in Human Resource and Career Development for Future Eco-society

M: I'm the Senior Vice President of Japan International Cooperation Agency (JICA), but participating as member of International Committee of Honda Foundation.
Topic: Private-sector involvement in human-resources development and career development for the younger generation. Before discussion of the topic, three professionals offer messages to the younger generation.

Messages to Younger Generation from Professionals

NT: On smart cities, the Ministry of Finance of Cambodia (MOF) does not yet have a policy for smart cities but it is working on a digital economy policy for publication in 2020. The policy focuses on:

1) Digital infrastructure: Large volumes of high-quality data are required for smart cities. Mobile data penetration in Cambodia is 100% but is mostly used for social media and entertainment and so is irrelevant to digital policymaking. Infrastructure coverage is excellent in big cities but still poor in rural areas and in last-mile coverage.
2) Digital government: Policy requires evidence, which requires data, but government services are not yet fully digitalized, so data gathering is currently inefficient.
3) Digital business: Digitalization is necessary for business to compete and innovate.
4) Regulatory framework is necessary to protect data.
5) Human resources (the theme of this discussion): Students and workers need digital skills in order to create the smart city.

According to several studies, two-thirds of companies in Cambodia are unable to hire the ICT professionals they need. All sectors in Cambodia need to work together to develop the human resources necessary to raise digital networks, infrastructure and services to the necessary level for smart cities. The future depends on the young people assembled here, so young attendees' input is welcome.

JT: In a JICA project in Thailand in the 1990s, JICA launched a doctoral program after a previous program had failed. The JICA program succeeded in graduating several doctoral graduates. The problem was linking to the private sector. University lecturers had little private-sector contact and companies complained that PhD holders were too academically inclined for private-sector work. The same problem happened in Japan, which is why laboratory-based education (LBE) is now emphasized there. LBE was successful because students worked with other sectors to tackle real-world problems. Today the opportunities in Thailand are great and Thailand's economic standard is much higher than 20 years ago. These things take time, so if Cambodian

academics keep up the interaction with the private sector, their time will come soon enough. Vietnam is already well ahead. Supplying human resources to the private sector will be hard at first, as industry will complain as described above, but listen to the input from the private sector and results will improve over time.

KI: Entrepreneurship is difficult to learn. Babson College in Massachusetts is No. 1 out of 600 in the United States in terms of entrepreneurship. Several Japanese company presidents are alumni of Babson, including Motoya Okada, president and CEO of Aeon Co., Ltd. and Akio Toyota, president of Toyota Motor Corporation. Y Combinator, the biggest human resource development agency ("accelerator") in the United States, is the source of 70% of company founders coming out of the United States. These two are good places to learn benchmarks and best practices to combine with one's own originality and the context of each country. In science parks, Takeda Pharmaceutical Co., Ltd., a major pharmaceutical company in Japan, opened its own science park in Kanagawa Prefecture in 2018. Before starting, the founders learned at an MIT mentor program. Programs such as these are valuable sources of ideas that can be used in the difficult challenge of entrepreneurship.

M: Several speakers tell frankly of the difficulty of starting a business. In Japan in the 1970s it was also difficult but it was helped by an expanding economy. Today Japan's economic growth is stagnant but Southeast Asia's is more dynamic, so there may be more opportunities for startups. Remember to study best practices but adapt them to one's own situation.

Messages from Younger Generation

M: Asian people are polite and don't like talking back to their elders, but it is useful to make counterarguments. Please say something to disagree with the old folks on the stage.

SS: I'm a Y-E-S Award winner in 2018, founder of Oceanland, alumnus of Royal University of Phnom Penh (RUPP), also studied at the Royal University of Agriculture (RUA), started a startup company two years ago. Worked with farmers to find solutions using the "human design approach," identifying the real problem and then choosing the right technology to work with people to solve it. The technology is workable but not marketable due to lack of private-sector and public-sector support, but an incubation program is starting up soon at RUA so the situation is hopeful. Many private companies are paying attention to young people, providing them with a platform for learning about how to start a business, how to run a business, solve problems, manage people, etc. Interviewing is a problem because many Cambodians do not express themselves well, but it is possible to gain an understanding of prospective employees' attitudes. On marketing, competition is intense both in Cambodia and internationally. Regarding mindset, young entrepreneurs need to be more open to advice from professionals and elders. In conclusion, Cambodia needs curricula for demonstrating startup ideas, because there are young people in Cambodia ready to start business ventures but they need mentoring from the private sector and from more senior people in the professions and universities who are willing to listen to their ideas. The speaker urges young people to explore, set goals, be ambitious, test themselves.

SUK: The topic is "how the private sector can contribute to human resource development for eco-society." The private sector has produced self-driving cars, robots and rockets that fly to the Moon, so if they focus on developing human resources for eco-society, using their tremendous resources and planning abilities, they can do amazing things. The young people assembled here will be innovators and leaders of tomorrow. The office is the second home of every individual, so if young people can promote eco-society in office culture to focus on sustainability and consciousness, they can make a great difference. Please build your future businesses to be eco-conscious and sustainable.

M: People learn not just in universities but in their workplaces as well, so we ourselves can create the environment for lifelong learning in our workplaces.

NDQC: I'm from Ho Chi Minh City University of Technology, Vietnam. The university has a technology business innovator, the first of its kind in Vietnam, with funding from Overseas Development Institute (ODI). When it was founded 10 years ago, startups were not widely discussed. Many initial challenges in investment and training of students, but after a few years some companies were founded, starting with ODI and later with other sources, such as the TV series *Shark Tank*. The supporting policies from the government is vital, as the young entrepreneurs are still learning how to form teams, how to build a company and so on.

M: University incubation centers are in vogue now, connecting young entrepreneurs with universities and the private sector to start businesses and provide real-world experience.

PPT: Talking about the role of education in developing human resources toward eco-society: Mismatch between

university learning and industry needs is a problem. Asking students: Does your education provide you with the skills you need in industry? Using alumni tracking programs, I would like universities to conduct surveys to find out what challenges alumni of universities in developing countries are facing in startups and how well they can apply their university knowledge there. Young people should ask whether their universities are serving their needs in terms of developing human resources for eco-society, thinking of the university as the "service provider" and students as the customers.

M: Japan has strong alumni networks, but this networking is becoming less cohesive today. Such networking may be stronger in Southeast Asia and India today. Good way to develop opportunities and connections.

KO: Main direct role of private sector is to create jobs, raising employment rates and living standards. But private sector can also assist universities in developing curricula in which students "learn by doing," connecting university learning to real-world experience. Trends in private-sector growth can influence which disciplines university students choose to study. Developing countries need investment, and the private sector can play a role in attracting investment to countries such as Cambodia. This inward investment creates a technology spillover effect into Cambodia. This will make society more sustainable. Finally, the private sector and universities can collaborate on R&D; for example, university students in Cambodia are working with Starbucks to develop eco-friendly materials for disposable coffee cups.

M: Both universities and the private sector need to change to make better use of the talents of the younger generation. The environment is one important area for industry-university collaboration.

Audience Questions and Comments

AQC1: In Laos, universities have little in the way of laboratory facilities, so even natural sciences must be studied theoretically only, not through experiment. Collaboration with private sector could solve this problem. Company internships would be helpful, so that after they graduate students can get a job.

M: Honda Foundation provides internships for some of the Y-E-S awardees and is working to improve the linkage between university study and practical experience.

LV: Personal experience: I graduated from Department of Water Engineering, Faculty of Engineering. However, upon return to my hometown, I was unable to get a public-sector job due to hiring limits. I now work in the private sector. Unemployment problem in Laos: Most graduates want to work in the government, because of job security. The private sector is difficult and challenging and not easy to apply to. The private sector can attract more talented graduates by focusing on quality as well as quantity.

M: "How to launch a startup" might be the real issue for many graduates.

Senior Panelists

M: Many topics were raised, so summarizing might be difficult. Panelists are instead asked to comment on whichever of the topics they wish.

KI: Students here have learned much from the spirit of the founder of Honda Foundation, Soichiro Honda. Just as Japanese people continue to learn from that spirit, Y-E-S awardees and other young entrepreneurs can learn from that spirit as well and can enjoy great entrepreneurial success.

NT: In terms of capacity development, students can learn from university, from cell learning, from internships or from employment at a company. One can also learn from creating a startup, but it can't be done alone. A team is needed. Technology developers need entrepreneurs and vice versa. Many resources are available to help, such as incubators and accelerators. But on the other hand the entrepreneur must be dedicated and determined to work hard. Failure happens frequently but "failure is an option": Every failure contains lessons learned that can lead to future success. If you fail, try again. If you keep failing, you still have a wealth of real-world knowledge that makes you valuable as an employee, with promotions coming quickly. If you can do it, just do it.

JT: Regarding collaboration with industry: Reflecting opinions of industry in university programs is a challenge in Japan also. I am working on a doctoral program for that purpose. The problem is that each sector of industry says different things, so the discussion is vague. However, LBE is recommended because it teaches students to improve communication skills, work in teams, be punctual, help each other and so on. These skills may not bear directly on specific industry needs but they are a valuable complement to traditional coursework.

Concluding Remarks by Students

M: Please tell us about your dream regarding creating the eco-society, or whatever you want to share.

SUK: If I work at, lead or start a company, my vision will be: "With consumption, compassion; with growth, gratitude; and with profitability, equal focus on sustainability."

PPT: Everyone is encouraged to be an entrepreneur. I'm worried that there may not be room for all of us.

MS: I'm working with an SME with a good business model and am receiving investment funding and mentoring from the private sector. If you have a good idea in technology and a good business model, don't be afraid to tell the world about your business model or product. There are many competitions and challenges in Cambodia, as well as startup centers and so on. The private sector can be investors as well as mentors. Nothing is impossible even if you're young.

KO: Creating the future sustainable society is for everyone, not just for companies and government but for all of us. Message to young Cambodians: Keep learning, explore your passion and you can make it, maybe even CEO of a company.

LP: To build an eco-society, the private sector and public sector must collaborate through PPPs. Both are needed for good management and career development. I took part in a competition and though I did not win I learned what a startup is. Poorer young people from rural backgrounds sometimes have to cut short their university studies, so the private sector is important for such young people for scholarships, internships, workshops and other opportunities. In the competition, I met many people who had no formal academic training. PPS are important for smart cities.

SS: I feel ready to take on the challenges of entrepreneurship. My startup creates compost for smallholder farmers. When I started I was afraid of earthworms. After learning more about them now I love them. Many farmers have cultural resistance to raising earthworms but some farmers supported the business. Now I feel I can do anything. If you feel afraid, just explore and you can do it. I am motivated by the ability to help smallholders boost income. I'm young and look forward to exploring the world.

DPL: At first "eco-society" seemed like an idealistic term, but through this symposium I have learned that it is holistic and realistic. Students should keep seeking higher education and keep looking for opportunities and they will find them, because opportunities are everywhere. Early exposure to industry is important. Internships, etc. build up the individual as a person who can have an impact on the world. Sustainability is important to live well with oneself, society and nature.

ST: Everyone should explore what they don't know or want to know. When you find something you want to do and learn how to do it, you build self-esteem. Experience and achievements help you to reach your career goals.

LV: Eco-society is a large topic. Some countries talk about transportation, others about renewable energy. But the goal is the same: to save our world, to have a good life, to make people and communities resilient. To achieve these goals, sectors must work together, but they must be guided by sound policy.

NDQC: For eco-society, first identify who you are, what you can do, and what situations you want to improve. Then find a team with the same goals. Then ask for help from experienced people around you, using your own learning and experience.

M: Everyone has great vision and passion. Best of luck and remember the older professionals are available to assist you.

DAY 2

Conclusion Speeches

Mr. Akira KOJIMA, Director of HOF/President of Center for International Economic Collaboration (CIEC)

Dr. Chan Oeurn CHEY, Vice Dean, Faculty of Science, RUPP

Dr. Sovann EN, Y-E-S Cambodia 2009 Awardee

Mr. Akira KOJIMA
Director of HOF/President of Center for International Economic Collaboration (CIEC)

Conclusion Speeches

After having a very intensive one and a half day of sessions, I must confess I'm a little tired. How about you? But some feeling of satisfaction accompanies it also, with having a deeper understanding of more connectedness, we are getting a bit smarter.

At this very moment, the COP25 Ministers' meeting is happening and they are discussing this subject, eco-society. This subject is very important. And I have a deep impression that this kind of interface discussion is very important. As we go deeper into the internet age, we must also have the interface. And I also find that young thinkers and doers have very strong confidence in the future. I'm very glad to find that.

Before we can go further, let me try to check where we are now. This is the 21st century and this century is supposed to be the age of Asia. The economic and financial crisis happened in this region some 20 years ago. At the time, non-Asian economists said that this was a crisis of Asian crony capitalism. For many centuries European scholars have talked about Asian economic stagnation, but they could not forecast nor explain the later spectacular development of the Asian economies in the 1970s and '80s. Then they began to talk about the "Asian miracle." But the "Asian miracle" school could not forecast nor explain the following 1997 Asian crisis. They then began to talk about crony capitalism. This "crony capitalism" school could not forecast the quick recovery until now. So the bottom line is that the theory could not catch up with the ever-changing realities in Asia. We must free ourselves from temporary thinking. We must have a long-term historical perspective.

The European scholar, Andre Gunder Frank, his sensational book was published in the year 1998, when Asia was suffering from crisis. Actually it was in the very midst of the Asian crisis. The book's title is *ReOrient*, subtitle *Global Economy in the Asian Age*. "ReOrient": R-E, and a big capital letter "O," Orient. It means "Again Orient" and also small-O "reorientation," of Asia. This author tried literally to reorient traditional European views away from Europe-centrism. And then the OECD, a party-based think-tank type of head office, published a big-volume book written by Angus Maddison, who passed away some years ago. The title was *The World Economy: A Millennial Perspective*. He tried to estimate the GDP of many countries going back more than 10 centuries. And in this book I found an interesting thing. In the year 1829, in that year almost 50% of total global GDP was produced by two big countries: India and China. But other Asian economies were having larger share than USA or UK at that time. So Asia is not simply emerging. We are now seeing a re-emergence, rather than simple emergence. Coming back to today's subject, we can tackle the challenge of producing important Asian role models for smart cities, which offer comfortable life and environmentally-friendly and business-friendly conditions. We are now seeing global competition among cities. The concept of smart cities emerged, I think, around the year 2000. But digital technologies have been accelerating this competition among smart cities. In the year 2019 India and China had plans to create some 100 smart cities respectively. Smart cities are getting ever more important in the global trend of urbanization, as urbanization is still continuing. According to a United Nations survey, more than 50% of the global population, namely 7.6 billion, as of 2018 is living in cities. It was the year 2007, I remember, when the urban population became larger than that of the farming areas. In the year 2030 this share of urban population will be much more. It is expected to be over 60% of total global population. In Asia-Pacific countries and regions excluding Japan, as of 2015 there are 216 cities with populations of over one million people. These cities' total population is 690 million. In the year 2035 more urbanization will push up this number to one billion. Rapid urbanization produces many problems: Population congestion, traffic jams, environmental disruption, sometimes crime, shortage of many types of

infrastructure. Here comes the important challenge for smart cities: In the process of creating better performing smart cities, we need a strong sense of mission amid technological challenges. Technology, I think, itself does not produce value-added. The important thing is how to make use of technology—utilization. So to use technologies we need a philosophy, a sense of mission. If we can tackle the challenges of the Asian economies, the Asian countries can have some kind of leapfrog type of development over those challenges. While listening to your very interesting discussions in the past two days, many catchphrases, words came into my mind. And they all happened to have the initial "D." Development? OK. Density in cities, demography, depopulation in Japan, and data, this morning. Data, data, I want to repeat it, data. Digital technologies, digitization, diversification, as was mentioned yesterday by Dr. Kalyan. Today the last session was dominated by ladies. Degradation of the environment related to the decarbonization that people are talking about, again "D," and also relating to this concept we often hear about decoupling, decoupling from economic growth, from the increasing consumption of resources, and energy. Actually in the past, in the 1970s and early '80s, Japan was very successful in the process of decoupling. We had economic growth, but the total consumption, input of energy and resources grew much, much slower and even declined. So that is important, decoupling. Another catchphrase we often hear recently is "disruption." "Disruption" means that keeping past trends and extrapolating on those trends is not enough; we must have some change in the paradigm.

Lastly, yesterday I came across a big parking lot in the campus and found that many motorcycles were parked there. About 99% of them are Honda motorbikes. Honda Dream motorcycles. So "Dream" is not only for motorcycles. "Dream" is our challenge. Dreams were the driving force for challenge of Soichiro Honda, founder of Honda Foundation. Honda Foundation is keeping this spirit of "Dream." So let's try to keep our dreams. This is your century, the Asian century. So after some fatigue I am very much satisfied with your wonderful contributions. Thank you very much.

Dr. Chan Oeurn CHEY
Vice Dean, Faculty of Science, RUPP

Conclusion Speeches

A very good morning, again. First I would like to thank Honda Foundation and the whole RUPP team for making this event very successful, organized and a lot of discussions over just the few days up to now. When we see the topics of discussion we can know that they cover multidisciplinary areas about things that happen all around us every day and keep changing, changing all the time. And we don't repeat change and we start to think about new ways of living. How can we live in sustainable ways? How can we live in better conditions and come up with a lot of discussions on smart cities? And connect to several topics related to education also. Because smart cities need smart education. Smart cities need smart people. So technology is so important. Due to the rapid changes in nanotechnology, due to integration in ICT, people can have opportunities to use those technologies for their everyday lives, for their work, for their business, for industry. So technology is something there, but how to utilize it in meaningful and peaceful ways? This is very important, that we have discussed so far among the topics, including economics, diversification and other topics also, because we are thinking about economics. But economics is not the only thing that we are thinking about. We also have to think about human life. About sustainables: How to live, how to balance between science and nature, between the environment and economics. This is a better way that was covered during these two days' discussions and we come up with a new way of learning. And we have worked, we have talked with many partners in Cambodia so far, especially RUPP.

We work very closely with the relevant Ministries. We work with the private sector, including the startup sectors, sitting here with us. We work with different partners, international partners, including Honda Foundation, to find a way out. When we see that our young generation is really eager to learn new things, eager to do something for a better future, let us open the door for them. How can we make this happen? How can we work together, including industry, government and academia, sitting together? So today's platform and discussions are really the start of a new way, a new gateway for the younger generation. So I think this is a very important event. I'm really happy and thankful for the organizers and I hope that it's not the end. I hope the spirit of the conversations over the past two days continues regularly everywhere in the universities and Ministries, they have to work together. From this I can conclude that now it is time for us to work together. Because previously, a long, long time ago, the universities never talked to industry. We talked, but really only about limited things. And we produced people who did not respond to the skills needed in industry. And even the policymakers at the government level make a lot of policy but sometimes the implementation of the policy is really difficult. That's why we need to sit together, to set common goals for a better future, for sustainability, and better life. I think now let's open the door for the younger generation for a better future. So this is my conclusion: That working together is the way forward to sustainability. Thank you.

Dr. Sovann EN
Y-E-S Cambodia 2009 Awardee

Conclusion Speeches

Thanks to the organizer for the introduction.

Your excellencies, distinguished guests, ladies and gentlemen, it is a great honor to say a few words at the end of this symposium.

First, I would like to thank you all for your numerous attendances and interactive discussion during this event.

This year, our main theme for the international symposium on ecotechnology is "conversion to achieve eco-society through the industry-government-academia collaboration: toward sustainability and quality of life."

As expected, we have seen a lot of interesting presentations from our experts representing academia, government officials as well as young entrepreneurs. I used the word young to refer to your new ideas, your inspiration to the young generation, and your new solutions toward a better eco-society, and not by your age!

During these two days we have put our focus on two main topics. The first one is sustainable smart cities and the second one is human resource development.

Ladies and gentlemen, if we are trying to wrap up our discussions on these two topics, please allow me to make a few notes on our keynote speeches, delivered by H.E. Dr. Mey Kalyan and Dr. Michiharu Nakamura. As mentioned by H.E. Dr. Mey Kalyan, if we are going further to plan the future it is very important to look back into the historical dimensions and ask ourselves if we are on the right track. At that time we will realize what will be the next challenge. Interestingly, on the other hand, Dr. Michiharu Nakamura is more interested in how Japanese government policymakers plan for the years ahead and by doing this he tried to introduce a new Japanese framework based on a try-and-error approach toward the sustainable development goals. What impressed me a lot was the kosen school framework, which allows students at the age of 15 to enroll in five-year engineering programs to prepare themselves for a career in STEM. This early adoption will allow them to be ready for STEM at a very young age and ready for the years ahead. I hope this framework will be widely adopted in Cambodia as well as in the region.

Ladies and gentlemen, our first session was about inclusive and sustainable smart cities. I was impressed by different key input from different speakers and their perspectives toward the same topics. I would like to start first with H.E. Dr. Chhem Rethy, who defined a city as a drama in time on green space and not by a physical place or building. A drama where all the emotion happens, and it should happen in a green place. He then tried to define a smart city as a combination of smart technologies, smart governance, smart finance and smart citizens. Professor Akinori Morimoto, on the other hand, is more interested in a fascinating concept, namely "smart sharing city," to fight the problem of population decline in Japan. To him, the concepts of the smart city and the sharing city are the same, yet they are very different. The smart city focuses on the use of ICT, whereas the sharing city focuses on public transportation. They are the same because they serve the same purpose: toward a sustainable and better future for humans, for citizens. I found this idea very interesting because this concept allows us to decentralize big cities and systematically allows us to use resources efficiently. Dr. Chanthy Lay and Dr. Shizuo Iwata seem to agree on the same thing: A practical approach toward sustainable city planning and development. To them, empirical study and planning and a data-driven approach will lead us to sustainable cities in the future.

Your Excellencies, ladies and gentlemen, our second topic of discussion was human resource development contributed by the private sector. We had several presentations and discussions from our government officials and from Japanese and Cambodian

entrepreneurs. I'm glad to learn from different people about their skills and their journeys toward better human resource development in Cambodia. I'm very convinced about the startup ecosystem in Cambodia in the context of global digitalization. Finally, I would also not like to forget to thank Mr. Kei Iinuma for his inspirational success journey carried out at Kanagawa Science Park and his great deal of experience in this field. Thanks also to Dr. Tomohiro Fujita for his inspirational entrepreneurial spirit and his kind consideration to encourage our young engineers and scientists to involve entrepreneurship. I hope his clear message on how to create a society that encourages people to do whatever they are eager to do is shared with our young entrepreneurs in Cambodia in the future more and more.

This morning we had two panel sessions by our young scientists. I will not try to wrap this up because our moderator has done a great job already. Anyway, I thank them for their activities and courage. We went through a very interactive and interesting discussion. I would like to thank the organizers again for allowing the young generation to actively involve, learn, get inspired from, and be ready to take action for a better eco-society in the future.

One thing I would like to raise is it's very vital to understand the differences in each country and promote mature understanding among our young participants through this symposium. This symposium lasted only one day and a half and I understand this is a very short time in your lifespans. But it will be a precious experience to learn and get inspiration from each other. I sincerely hope that, through this symposium, new collaborations and new friendships will last a long time, and help us to fight for better sustainable development and life in the future.

Finally, on behalf of the Y-E-S awardees, I would like to express my appreciation to all the participants for taking time to attend this symposium. Thanks also to RUPP and CJCC for all their organization and logistics. Last but not least, I would like to express my gratitude to Honda Foundation and the Japanese people, in general, for their years of support in promoting ecotechnologies as well as sustainable development in Cambodia.

To our foreign guests and friends, I wish you all a safe and pleasant flight back to your countries and I hope you enjoyed your stay in Cambodia. To our young students, I wish you success in your study and current journey. Thanks for your attention.

公益財団法人 本田財団
HONDA FOUNDATION

Honda Yaesu Bldg., 6-20 Yaesu 2-chome, Chuo-ku, Tokyo 104-0028
Tel: +81-3-3274-5125 Fax: +81-3-3274-5103

https://www.hondafoundation.jp