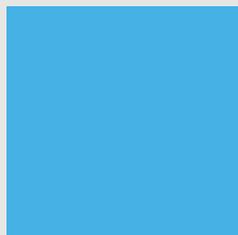
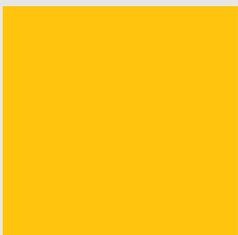
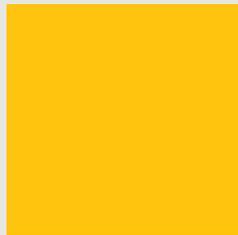
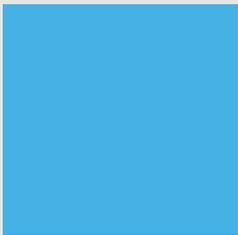


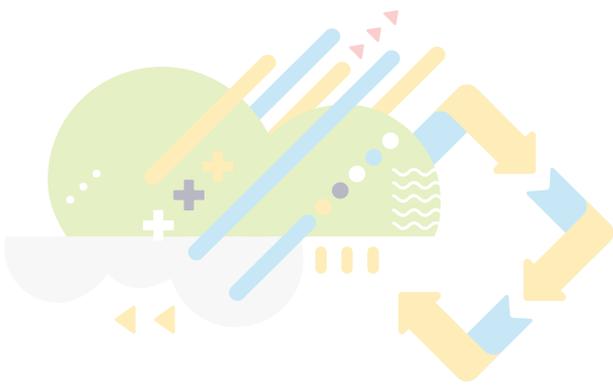


# PRESIDENTS' FORUM 2021

**Bio-Circular-Green Economy:  
Turning Challenges into Opportunities  
in the Post-COVID-19 World**

13:30 - 16:40 hrs.,  
26 March 2021  
Thailand Science Park,  
NSTDA





## Contents

<b>03</b>	<b>Introduction Statement</b>
<b>05</b>	<b>Program Summary</b>
<b>06</b>	<b>Chair: Dr. Narong Sirilertworakul</b>
<b>07</b>	<b>Speaker 1: Prof. Dr. Chen Chien-jen</b>
<b>09</b>	<b>Speaker 2: Prof. Dr. Hasan Mandal</b>
<b>12</b>	<b>Speaker 3: Prof. Joachim von Braun</b>
<b>14</b>	<b>Speaker 4: Prof. Emeritus Dr. Kraisid Tontisirin</b>
<b>17</b>	<b>Organizer</b>



## Introduction Statement

For over 15 years, the National Science and Technology Development Agency (NSTDA) has been hosting the NSTDA Annual Conference, or NAC, to showcase the research and innovation that NSTDA and its local and international partners have achieved over the year. Comprehensive scientific seminars, exhibitions, the Thailand Science Park Open House, a job fair, and STEM educational activities complete the full program of NAC, making it one of the most exciting events of the year for our scientific community.

NAC2019, the last conference held before the pandemic hit, was a great success and attracted more than 5,000 participants to the scientific seminars/workshops, 4,065 visitors to the exhibition, and 367 attendees to the open house activities. The program consisted of 49 scientific conferences, seminars and workshops. On display in the exhibition zone were over 100 inventions developed by NSTDA and its partners from the public, private and academic domains, as well as by the tenants of Thailand Science Park. An open house activity introduced visitors from the private sector to the laboratories of NSTDA and to the tenants of Thailand Science Park that offer research and testing services.

NAC2021 will be held on 25-30 March 2021 with a focus on the “Bio-Circular-Green Economy (BCG)”. Thailand is investing heavily in BCG to achieve a sustainable and inclusive economy, and is employing science, technology and innovation to enhance the country’s competitiveness. The BCG sector comprises many of the country’s most important industries: agriculture and food; bioenergy, biomaterials and biochemicals; medical and wellness; and tourism and the creative economy. By 2025, the Thai Government aims to increase the value of these industries by 30 percent, making BCG industries equivalent to 25 percent of GDP.

As the key driver of BCG in Thailand, NSTDA has developed a 5-year BCG strategic plan consisting of directions to 1) promote sustainability of biological resources, 2) strengthen communities and grassroots economy, 3) enhance competitiveness of Thai BCG industries and 4) build resilience to global changes. NSTDA is committed to employ its expertise in core technologies, utilize infrastructure at Thailand Science Park and the Eastern Economic Corridor of Innovation (EECi) and form partnership with local and international alliances to implement this 5-year plan. This strategic plan has been endorsed by the National BCG Management Committee chaired by the Prime Minister in January 2021.

One of the highlights of NAC2021 will be the Presidents' Forum - a roundtable in which leaders of prominent international research organizations are invited to share and discuss their views on various science, technology and innovation issues with leaders of research and academic institutes in Thailand.

The Presidents' Forum was first organized at NAC2019 and focused on R&D management. Participants included Prof. James C. Liao (President of Academia Sinica), Prof. Yeong-Her Wang (President of National Applied Research Laboratories, NARLabs), Dr. Raj Thampuran (Managing Director of Agency for Science, Technology and Research, A\*STAR, Singapore) and Dr. Eden Y. Woon (President of Asian Institute of Technology, AIT).

The 2021 Presidents' Forum is scheduled to take place on 26 March 2021 with the theme "Bio-Circular-Green Economy: Turning Challenges into Opportunities in the Post-COVID-19 World" where discussions will focus on how research and innovation can support BCG and sustainability in the world after the pandemic and provide opportunities for international collaboration.

As the COVID-19 outbreak still persists, NAC2021 will be held in a virtual format. Like its previous editions, NAC2021 will consist of a wide range of activities including scientific seminars, discussions, exhibitions, STEM activities for children and Thailand Science Park Open House.

This event brings together presidents and leaders of leading scientific organizations and academic institutes from Thailand and overseas to share experience, perspective and best practice on the commercialization of research results. The forum also aims at promoting collaboration among institutes to advance the process of research translation and commercialization.





## Program Summary

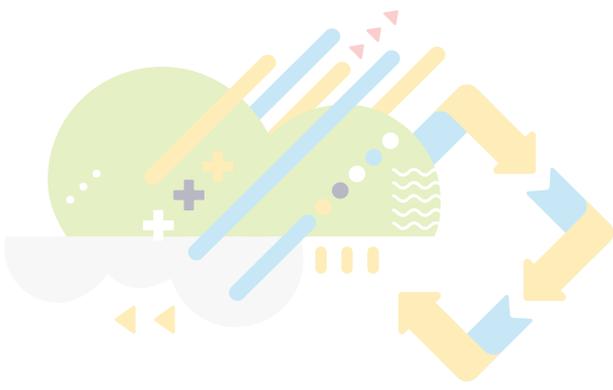
### Presidents' Forum

#### Bio-Circular-Green Economy:

#### Turning Challenges into Opportunities in the Post-COVID-19 World

26<sup>th</sup> March 2021; 13:30-16:30 hrs., Thailand Science Park

- 13:30-13:40 hrs.**     **Welcome Remarks and Introduction to the Presidents' Forum**  
By Dr. Lily Eurwilaichitr  
NSTDA Vice President
- 13:40-14:00 hrs.**     **Opening Remarks**  
By Dr. Narong Sirilertworakul  
NSTDA President
- 14:00-15:20 hrs.**     **Keynote Speeches on “Bio-Circular-Green Economy:  
Turning Challenges into Opportunities in the Post-COVID-19 World”**  
(20 mins per speaker)
- 1. Prof. Dr. Chen Chien-Jen**, Distinguished Professor Genomics Research Center, Academia Sinica and Former Vice President, Taiwan  
Theme: Health and Vaccine
  - 2. Prof. Dr. Hasan Mandal**, President, Scientific and Technological Research Council of Turkey (TÜBİTAK), Turkey  
Theme: Sustainable Development
  - 3. Prof. Joachim von Braun**, Director, Center for Development Research (ZEF), Bonn University, Germany and President of the Pontifical Academy of Sciences of the Vatican  
Theme: Bioeconomy Policy
  - 4. Prof. Emeritus Dr. Kraissid Tontisirin**, Senator of Thailand and Former Director of Food and Nutrition Division, the Food and Agriculture Organization of the United Nations (FAO)  
Theme: Food and Agriculture
- 15:20-16:20 hrs.**     **Open Discussion**  
Moderated by Prof. Prasit Palittapongarnpim  
NSTDA Executive Vice President
- 16:20-16:30 hrs.**     **Conclusions and Closing Remarks**  
By Dr. Narong Sirilertworakul  
NSTDA President



## Chair



**Dr. Narong Sirilertworakul**  
NSTDA President

Dr. Narong Sirilertworakul is currently the President of the National Science and Technology Development Agency (NSTDA). His key roles contributing to an international scientific community include serving the Alliance of International Science Organizations in the Belt and Road Region (ANSO), China as the Governing Board member; Advisory Board member of Chinese Academy of Sciences - the Innovation Cooperation Center Bangkok (CAS-ICCB); High Commissioner of the World Business Angels Investment Forum (WBAF); Corresponding Member of the European Association of Research and Technology Organizations (EARTO); Council member of Science and Technology in Society Forum (STS Forum), Japan; and Advisory Board member of the Global Young Academy (GYA).

In Thailand, he is also an Advisor to the Sub-Committee of the National Research, Sciences, and Innovation of the Senate; Chairman of the Innovation Qualification Examining Committee of the Thai Innovation List, the program whereby products and services entitled to a fast-track treatment in the government procurement process; Chairman of Microinnovate Co., Ltd, Board of Director of Internet Thailand Public Company Limited, Board of Director of SAKUN C Innovation Co., Ltd., and Executive Committee of the Thailand Center of Excellence for Life Sciences (TCELS) in addition to many other positions in the public and private sectors. His previous professions include a researcher at the National Metal and Materials Technology Center (MTEC) and a director of Quality Management Systems for Automotive Industry at NSTDA.

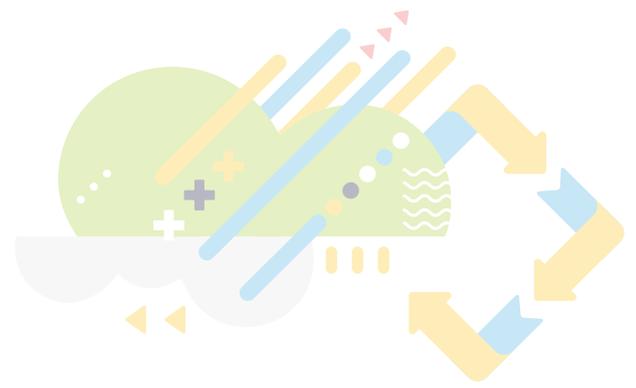
Dr. Sirilertworakul was the person who implemented the ISO 9000 at NSTDA in 1994. He was also expert in other quality systems, namely the QS 9000 and the ISO/TS 16949. In addition, he was a member of the working group that set up the Thailand Quality Awards (TQA) and a member of the Governing committee for the Thailand Quality Awards.

Dr. Sirilertworakul earned his bachelor's degree in industrial engineering with first-class honors from King Mongkut's Institute of Technology Thonburi. Soon after his graduation, he was granted a scholarship to continue his Ph.D. in manufacturing engineering at the University of Birmingham, UK. in 1993. In 2008, he completed an Advanced Management Program at Harvard Business School.



**Dr. Chen Chien-jen**

Distinguished Professor, Genomics Research Center,  
Academia Sinica and Former Vice President, Taiwan



**Speaker**

Prof. Chen, Chien-Jen received his Sc.D. in epidemiology and human genetics from the Johns Hopkins University (1983). He then worked as an associate professor (1983-1986) and professor (1986-2006) of National Taiwan University. He was appointed as the director of Graduate Institute of Public Health (1993-1994), founding director of Graduate Institute of Epidemiology (1994-1997), and dean of College of Public Health in National Taiwan University (1999-2002). He became a distinguished research fellow of Genomics Research Center of Academia Sinica (2006-2015), and was appointed as a vice president of the academy (2011-2015). He was appointed as the Minister of Department of Health (2003-2005) and Minister of National Science Council (2006-2008). He was elected as the 14<sup>th</sup> Vice President of the Republic of China (Taiwan). He is now an academician and distinguished research fellow of Genomics Research Center, Academia Sinica.

Prof. Chen has dedicated himself to molecular and genomic epidemiological research on chronic arsenic poisoning and virus-induced cancers over 40 years. His discoveries of multiple health hazards of arsenic in drinking water has led to the global awareness and mitigation of the largest environmental calamity, and his research on end-stage liver disease risk prediction of chronic hepatitis B has pioneered the viral load paradigm in its clinical management. He has published over 750 scientific articles and over 75 books/chapters, which have been cited for over 93,000 times with an H-index over 140 (Google Scholar).

Prof. Chen was elected as an academician of Academia Sinica (1998), a member of World Academy of Sciences (2005), an honorary member of Mongolian Academy of Sciences (2007), and a Foreign Associate (international member) of US National Academy of Sciences (2017). He has received many awards and honors including the Presidential Science Prize (2005) and the Order of Dr. Sun Yat-sen with Grand Cordon (2020) in Taiwan, the Cutter Lectureship on Preventive Medicine of Harvard University (2008) and the Knowledge for the World Award of Johns Hopkins University (2012) in the USA, the Officier of the Ordre des Palmes Académiques (2009) in France, the Knight of the Equestrian Order of the Holy Sepulchre (2010) and the Pontifical Equestrian Order of St. Gregory the Great (2013) in Vatican. He received honorary doctoral degrees from China Medical University (2014), National Sun Yet-Sen University (2020), and Kaohsiung Medical University (2020) in Taiwan.

# Abstract

## Global Health and Universal Vaccination

Chien-Jen Chen, Sc.D., Ph.D.

Genomics Research Center, Academia Sinica

Both acute and chronic infections threaten human health and sustainable development significantly. The catastrophic COVID-19 pandemic originated from Wuhan, China in December 2019 is a good example. Cumulatively, there were over 109 million confirmed cases with over 2.4 million deaths of COVID-19 in February 2022. Both Taiwan and Thailand have successfully contained COVID-19 with a low mortality. In the report of National Bureau of Economic Research in the USA, Taiwan was the country with the lowest COVID-19 mortality and the best economic growth rate in more than 40 countries. Taiwan's successful model was based on prudent action, rapid response, early deployment, and transparency. Both good governance and civic virtues based on honesty, mutual trust and solidarity are very important for the successful containment of COVID-19 pandemic in vibrant democracies like Thailand and Taiwan. Every dark cloud has a silver lining. COVID-19 pandemic has accelerated the research and development of diagnostics, anti-virals and vaccines in the world. It is a consensus among experts that only effective COVID-19 vaccines will end the pandemic. The pandemic has facilitated the development of vaccine platforms distinct from classical vaccines. The classical platforms can be divided into virus-based (inactivated or live-attenuated virus) and protein-based (protein subunit or virus-like particle) platforms. The next-generation platforms include viral vector vaccines, nucleic acid-based vaccines and antigen-presenting cells. Three vaccines derived from next-generation platforms have been approved by World Health Organization. These novel platforms may also increase the response time when new viruses emerge in the future. Equal distribution of vaccines in the world without vaccine nationalism to assure the universal immunization is essential for the elimination of COVID-19. Global solidarity through international cooperation is the key for the prevention and control of future pandemics of emerging infectious diseases.





**Prof. Dr. Hassan Mandal**  
President, TÜBİTAK, Turkey



**Speaker**

Prof. Hasan MANDAL was born in Eskişehir in 1965. He received his education at Yunus Emre Primary School, Atatürk Secondary School and Vocational High School on Engines and Motors. Professor Mandal received his bachelor's degree from the Department of Metallurgical Engineering at Middle East Technical University as an honour student in 1987, and his PhD degree from Newcastle University, United Kingdom in 1992. He completed his post-doctoral studies at Newcastle University, United Kingdom during 1992-1994, and at Karlsruhe University, Germany in 1997-1998.

In 1994, he started his academic career as an Assistant Professor in the Department of Ceramic Engineering at Anadolu University. He achieved Associate Professor status in 1996 and tenured Professor status in 2001. Prof. Hasan Mandal has more than 140 published studies, 70 of them are published in SCI journals, as well as 6 international patents. He has an H-index of 16 and has been cited approximately 1200 times. Prof. Hasan Mandal has been granted various national and international awards, including the TUBITAK Science Award. He is currently a member of the Turkish Academy of Sciences (TÜBA), World Academy of Ceramics (WAC) and Academia Europaea (AE).

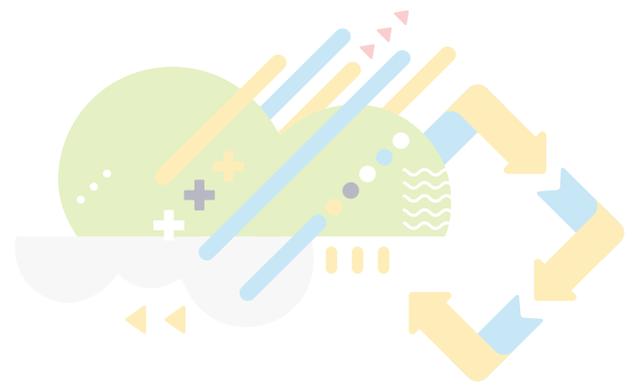
Prof. Hasan Mandal served as the Director of Research and Graduate Policies (RGP) between the years of 2011-2015 and, at the same time, was appointed as Vice Rector of Sabancı University in January 2012.

He also served as the President of the Global Engineering Deans Council, the first Vice President of the International Federation of Engineering Education Societies, the President of European Ceramic Society, the Vice President of Anadolu University and the Dean of the Faculty of Engineering and Architecture of Anadolu University, the Chairperson of Turkish Engineering Deans Council, Board Member in both ATAP and GOSP Technoparks, Board Member in Inovent Innovative Ventures, Board Member in BOREN and Executive Board Member at TUBITAK's Technology Transfer Mechanisms Support Group (TEMEG) and TUBITAK's Engineering Research Group (MAG).

Prof. Hasan Mandal was appointed as a member of YÖK (Council of Higher Education) on March 25, 2015. He was elected to the Executive Board of YÖK on April 1, 2015 and as the Deputy Chairman of YÖK on July 21, 2016. Prof. Hasan Mandal served in these positions until January 12, 2018 and as Deputy Rector of Sabancı University from January 12 to February 22, 2018.

He was assigned as the President of the Scientific and Technological Research Council of Turkey (TUBITAK) on February 22, 2018. He was appointed as a member of the Science, Technology and Innovation Policies Council on October 8, 2018 and he has assumed the duty of acting president on November 1, 2018. He was elected as the board member of the Council of Higher Education on April 27, 2019.



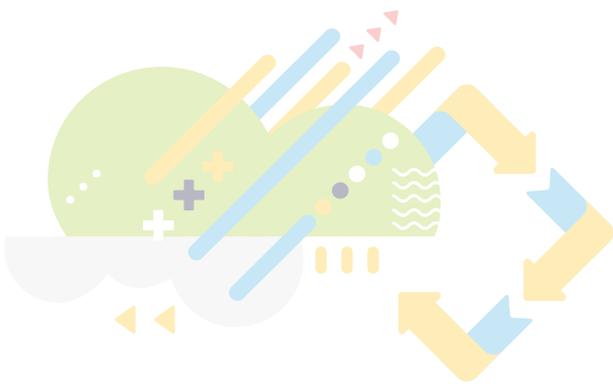


## Abstract

### Co-Creating and Succeeding Together towards Sustainable Development in the Post-COVID-19 World

**Prof. Dr. Hasan MANDAL, President of TÜBİTAK**

The strategic approach of the Scientific and Technological Research Council of Turkey (TÜBİTAK) focuses on co-creation based new knowledge and human resource development while mobilizing the R&D and innovation ecosystem towards impact with a particular emphasis on sustainable development. These co-creation based approaches for succeeding together include High Technology Platforms that have initiated their strategic research programs as well as the Industrial Innovation Network Mechanism where commercialization roadmaps are being developed. In addition, human resources are raised in partnership between universities and the industry in targeted areas while leading researchers from around the world are being provided fellowships to transform their research projects into impact in Turkey. Other recent calls have allowed small and medium-sized enterprises to conduct their R&D projects together with demanding institutions as well as supporting the transfer of intellectual property into production. The entrepreneurial ecosystem is further strengthened with the collaboration of institutions to support the successful business plans of entrepreneurs. Moreover, during the pandemic, a special COVID-19 Turkey Platform has been launched that involves 436 researchers across 49 different institutions in 17 vaccine and drug development projects for co-creating and succeeding together. Rapid calls for the ecosystem extended into those for social sciences and humanities along with online scientific conferences. Such a comprehensive mobilization within the R&D and innovation ecosystem extends to bilateral and international cooperation that currently encompasses 82 institutions from 62 countries. The Sustainable Development Goals (SDGs) have a particular role in supporting the common language for cooperation. In such a critical time that requires greater efforts for sustainability also for reducing the harmful impacts of resource use and waste generation that directly involves the Sustainable Development Goal on “Sustainable Consumption and Production,” this presentation will focus on the relevance of co-creation based approaches to turn common challenges into opportunities in the post-COVID-19 world. The special focus of the presentation will be a bio-circular-green economy that can reverse the trends of about 8.3 billion metric tons of synthetic plastics that has been accumulating over the last half century. The scope of this presentation will support the theme of enabling a sustainable and inclusive economy by deploying science, technology and innovation to enhance competitiveness across areas that will have an impact on society, including health, food and energy. The presentation will emphasize that an approach based on co-creation and succeeding together is vital for a sustainable future.



## Speaker



**Prof. Joachim von Braun**

Director, Center for Development Research (ZEF), Bonn University, Germany  
and President of the Pontifical Academy of Sciences of the Vatican

Joachim von Braun is a Director of the Center for Development Research (ZEF), Bonn University, and Professor for economic and technological change. He received his doctoral degree in agricultural economics from the University of Goettingen, Germany. His research is on economic development, science and technology policy, poverty reduction, food and nutrition security, agriculture, resource economics and trade. He published more than 100 peer-reviewed publications in these fields. von Braun is President of the Pontifical Academy of Sciences of the Vatican, member of German National Academy of Science - Leopoldina, Academy of Science and Engineering (acatech), Academy of Arts and Science North Rhine-Westphalia, fellow of African Academy of Science and of American Association for the Advancement of Sciences. He serves as Chair of the Scientific Group for the Food Systems Summit 2021 of the UN Secretary General. He is member of the Board of Alliance for a Green Revolution in Africa (AGRA), and Vice President of the German NGO “Welthungerhilfe”. He is co-chair of the Malabo-Montpellier Panel on African food and agriculture policy, and co-chair of the International Committee on Bioeconomy. From 2002 to 2009, he was director general of the International Food Policy Research Institute (IFPRI) based in Washington DC. He was elected as President of the International Association of Agricultural Economists (IAAE), received an honorary doctoral Degree from the University of Stuttgart-Hohenheim and other awards.



## Abstract

### Current and Emerging Bioeconomy Policy

**Joachim von Braun, Bonn University,  
International Advisory Committee on Global Bioeconomy (IACGB)**

Bioeconomy is driven by changes on the supply and demand side and by policy innovations. Bioeconomy impinges on many sectors of the economy. The developments in the biological sciences offer a huge potential not only for the more efficient use of biological resources for food, feed, fiber, and energy, but also for industrial products via innovations with enzymes and for innovations in the health sector. The emerging frontiers of bioeconomy are the interlinkages of biosciences with digitization, such as with precision farming and digital monitoring of crops and animal production and even more so in processing in food and non-food industries. This presentation focuses on bioeconomy policy. Countries of different economic structures and of different levels of income are currently pursuing Bioeconomy strategies. While their strategies differ, they have common goals and patterns. Policies aiming for expansion of bio-circular economic systems are mainly in four main domains: science and innovation policies, regulatory frameworks for industries, incentives and information for consumers, and fiscal policies facilitating restructuring economies. Sharing new bioeconomic knowledge across nations and rule based trade of bio-based products and services facilitate enhancement of sustainability through global bioeconomy. Bioeconomy policy connects to the large changes of societal, technological, and economic transformations. The essence of such transformational strategies is not only technological (new science) and behavioral (adjusted consumption), but central issue are institutional, i.e., providing the regulatory frameworks and long-term incentives for industry, consumers and for resource protection.



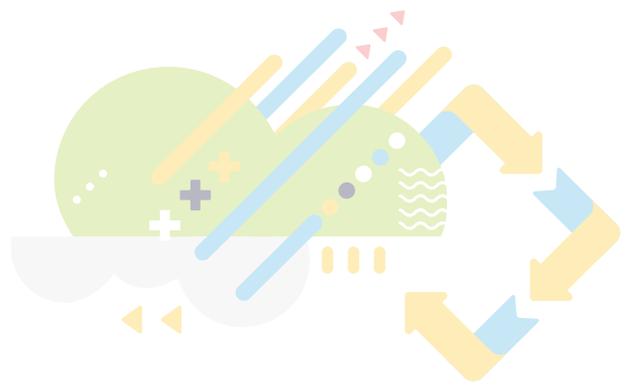
## Speaker



**Prof. Emeritus Dr. Kraisid Tontisirin**

Senator of Thailand and  
Former Director of Food and Nutrition Division,  
Food and Agriculture Organization of the United Nations

He received M.D. with honor from Mahidol University (MU) and PhD in Nutrition from the Massachusetts Institute of Technology, Pediatric Training from Vanderbilt and Harvard Universities. His previous roles and functions included, Vice President of MU, Chairman of the Policy board of the Thailand Research Fund, Chairman of the Evaluation Board of the Thai Health Fund, Chairman of MU Council, and a member of the Thai National Food Committee and chaired of the Planning Committee for the Strategic Framework for Food Management in Thailand. Internationally, he was the Director of Food and Nutrition Division of the Food and Agriculture Organization of the United Nations (FAO) in Rome, Italy from 2000-2006. His current positions include a member of the International Award Committee of the Prince Mahidol Award Foundation, and a Senator. He received numerous recognitions and awards including, the Most Distinguished Thai of the Year in 1999 from the Royal Thai Government, Dusadee Mala Kem Silapa Vithaya (the most distinguished medal in recognition of the contributions in art and science for Thailand) from His Majesty the King in 2005, the American Dietetic Association's Frances E Fischer Lecture Award in August 2008, "the 2013 IUNS Lifetime Achievement Award" from the International Union of Nutritional Sciences, and in 2018 he received the most Distinguished Physician Award from the Medical Council of Thailand.



## Abstract

### **Application of Bio-Circular-Green (BCG) Economy Model in Food and Agriculture** **Professor Kraisd Tontisirin, Institute of Nutrition, Mahidol University, Thailand**

Food and Agriculture are fundamental for livelihood, food and nutrition security, good health and well-being. They also play a crucial role for decent job and economic opportunity, social and culture dimension, tourism as well as ecological and environmental sustainability.

Currently, around 800 million or one in nine people are still hunger and about 130 million more are added up due to COVID-19 pandemic. While 2 billion people do not consume enough vitamins and minerals, 1.4 billion people are overweight and 500 million obese. Crops and livestock production use over 70 percent of all water withdrawal, and 30 percent of global energy have been used in food system. Food and agriculture systems also contribute to greenhouse gases and climate change. Food loss and waste have been around 30 percent. Due to demographic changes toward aging society, there are increasing needs of healthy diets with high nutritional quality and functional ingredient for healthy ageing and longevity.

Food and Agriculture transformation is essential to response to the above challenges as well as to support achieving the Sustainable Development Goals (SDGs), goal 2 on zero hunger, and other related goals including no poverty, good health and well-being, quality education, decent work and economic growth, responsible consumption and production, climate action, life under water, life on land, and partnerships for the goals.

In Thailand the Sufficiency Economy Philosophy (SEP) given by H.M. the late King Bhumibol Adulyadej has been promoted in national development plans along with actions for achieving the SDGs. The BCG Economy Model is an integrated platform bridging the SEP and SDGs fueled by science, technology and innovation. The current Strategic Framework for Food Management in Thailand (SFFMT) will be strengthened and benefited by applying or adopting the BCG Model throughout the food and agriculture value chain to increase productivity of safe and premium quality food with high nutritive values, and innovative products for consumers demand. Holistic concept for sustainability of food and agriculture systems have to be promoted and supported by increased investment in research and innovation throughout the food value chain to increase productivity and use less inputs, including genetic resources of crops, livestock and fish, technologies for production, processing and marketing for economic growth, social well-being and environmental sustainability. Circular economy will guide for reduce, reuse and recycle of all part (zero waste) of agriculture and food produced for value added products including human food, food

supplements, animal feeds, fuel and intermediate products for industry. Using by products from tuna canned food industry to produce food supplements i.e. fish oils rich in polyunsaturated fatty acids, fish bone calcium for bone health, tuna collage and hydrolysates is outstanding example. With regard to green economy food and agriculture will have to focus on ecological and environmental dimensions for sustainability such as biodiversity, reduction and neutralization of carbon and water foot prints, increased utilization of renewable energy, and using reusable and biodegradable food packaging to replace plastic. In summary the BCG economy model will enhance and guide for the transformation of food and agriculture for achieving the SDGs particularly goals 2 and other goals for sustainability development. Science, technology, research and innovation along with human capital development, management in food and agriculture along with appropriate investment are enabling factors for the success. Learning and sharing of knowledge and experiences in implementation of BCG economy model, SEP and SDGs at international, national and local are essential for further advancing in actions for sustainable development





## Organizer

The National Science and Technology Development Agency (NSTDA) is an autonomous government agency affiliated to the Ministry of Higher Education, Science, Research and Innovation (MHESI). NSTDA is tasked to be a driving force to enhance scientific and technological capabilities of Thailand and to enhance the country's competitiveness and the well-being of Thai citizen through science and technology. The agency is committed to achieve four strategic missions comprising; 1) research & development 2) technology transfer 3) human resource development and 4) S&T infrastructure development, through its five main national research centers; the National Center for Genetic Engineering and Biotechnology (BIOTEC), the National Metal and Materials Technology Center (MTEC), the National Electronics and Computer Technology Center (NECTEC), the National Nanotechnology Center (NANOTEC) and the National Energy Technology (ENTEC). In addition, NSTDA reaches out to other research organizations and universities through joint collaboration and other supporting mechanisms to ensure the best resources are being captured to meet the country's innovation needs. To tie all these functions together, the Technology Management Center (TMC) and the Agricultural Technology and Innovation Management Institute (AGRITEC) of NSTDA serve as a linkage between scientists and end users through various mechanisms.

