

7th International Conference
Sustainable Agriculture,
Food and Energy



**SAFE
2019
THAILAND**

SAFE 2019
International Conference
Sustainable Agriculture,
Food and Energy.
October 18-21, 2019
Phuket. THAILAND.

**Conference
Programme
Papers Abstracts**

**GREEN AGRI-FOOD ENERGY PRODUCTION
FOR A BETTER WORLD IN A CHANGING CLIMATE**

SAFE NETWORK
Asia Pacific Network for Sustainable Agriculture, Food and Energy

www.safe-network.org

**7thInternational Conference
Sustainable Agriculture, Food, and Energy
SAFE2019**

October 19-21, 2019
Phuket Rajabhat University, Thailand

**“Green Agri-food Energy Production for a
Better World in a Changing Climate”**

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Assoc.Prof. Sermkiat Jomjunyong, Ph.D

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SAFE2019 Committee

Virtual Farm Academy

SAFE2019 Program

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WELCOME MESSAGE FROM SAFE-NETWORK

Welcome to the International Conference on Sustainable Agriculture, Food, and Energy (SAFE 2019)

We are proud to welcome you to the International Conference on Sustainable Agriculture, Food, and Energy (SAFE2019): Green Agri-food Energy Production for a Better World in a Changing Climate" which will be held from October 19-21, 2019 in Phuket, Thailand. The host institutions are Phuket Rajabhat University, Chiang Mai University and Chiang Mai Rajabhat University. This conference is the 7th annual conference after the 1st International Conference on Sustainable Agriculture, Food, and Energy (SAFE2013) in Padang, Indonesia (12-14 May 2014), the 2nd conference SAFE2014 in Bali, Indonesia (17-19 September 2014), the 3rd conference SAFE2015 in Ho Chi Minh City, VIETNAM (17-19 November 2015), 4th conference SAFE2016, Colombo, Sri Lanka (October 20-22, 2016), the 5th conference SAFE2017, Malaysia, August 22-24, 2017 and and 6th SAFE2018 Conference is Makati, Manila. PHILIPPINES

Aside from the conferences, workshops and short course programs, SAFE-Network has expanded to producing SAFE Rice Project as an output of organic rice research conducted by Malaysian and Indonesian faculty-researchers. As the Network grows, the Network plans to embark on innovative platforms where "sustainability" can be served best especially to some group of learners who do not have sufficient background in agriculture science. The Network chooses Philippines, particularly CBSUA, to initially host the Virtual Farm Academy in collaboration with SAFE Network and eventually with universities from Malaysia, Indonesia, India, Pakistan, Iran, Thailand, Japan, Taiwan, Sri Lanka, Australia and Bangladesh who are also active members of the Network. CBSUA will take the lead in facilitating the modules to online participants and take the necessary actions in expediting the modular classes. The Network Head Coordinator, together with CBSUA President shall issue certificates of program completion to registered participants. We express our deep gratitude for the support given by Dr. ALBERTO N. NAPERI the President of CBSUA. The virtual farm academy will be launched in the opening ceremony of SAFE2019 and we invite all of us to discuss the operational plan of this Virtual Academy on October 19, 2019 in Phuket.

On behalf of SAFE-Network, we would like to say thanks and convey our appreciation to the Phuket Rajabhat University, Chiang Mai University and Chiang Mai Rajabhat University for co-hosting this conference.

We would like especially to thank Prof. Dr. Tafdil Husni, Rector of Andalas University for his strong support to this event, Assoc. Prof. Sermkiat Jomjunyong, Ph.D, Local Conference Coordinator, Dr. Worajit Setthapun, Conference Secretary and the members of the local organizing committee who helped with all the preparations required to make the conference a success, as well as the session organizers who worked to ensure a high level of science presented at the meeting. Moreover, of course, we thank all honorable speakers and participants who have agreed to attend and discuss your work! Finally, please understand that while every effort was made to publish this book as the "final" program, we know that unavoidable withdrawals and other changes will occur.

Welcome to SAFE-2019, Phuket! Please enjoy the friendship!
One planet! One happiness! Friendship creates wonders!

Prof. Dr. Novizar Nazir
SAFE-Network Coordinator



MESSAGE FROM THE RECTOR OF ANDALAS UNIVERSITY-INDONESIA

Sawasdi khap,

I would like to congratulate and convey my gratitude to the SAFE Network for undertaking the initiative to organize SAFE2019 (7th International Conference on Sustainable Agriculture, Food, and Energy). Andalas University is delighted to be the organizer of this conference since the 1st International Conference on Sustainable Agriculture, Food, and Energy (SAFE2013) in Padang, Indonesia (12-14 May 2014), the 2nd conference of SAFE2014 in Bali, Indonesia (17-19 September 2014), the 3rd conference of SAFE2015 in Ho Chi Minh City, VIETNAM (17-19 November 2015), 4th conference (SAFE2016) in Colombo, Sri Lanka, October 20-22, 2016, the 5th conference SAFE2017, Malaysia, August 22-24, 2017 and 6th SAFE2018 Conference is Makati, Manila (Philippines).

The theme of this year's conference is "Green Agri-food Energy Production for a Better World in a Changing Climate". Climate change is one of the most complex problems we face today. This issue involves many dimensions - science, economics, society, politics and morals and ethical questions - and are global problems, felt on a local scale, which will exist for decades and centuries to come. Activities in the agricultural, food and energy sectors are sectors that have an impact on climate change; but on the other hand, that are heavily affected by climate change itself. Therefore, the participation of the scientific community from universities and research institutions to address the problems related to climate change is highly expected.

Through the conference, we hope to generate substantial contributions to create a better solution and new value on sustainability and sustainable development of agriculture, food, and energy. We are confident that valuable innovation that can change or create more efficient processes, products and ideas are forged after attending this conference. Sustainability is a difficult issue and complex. It is not a goal but a process. I would like to thank the organizing committee and the co-organizer institutions for the hard work and full commitment in preparation of this conference.

Finally, we congratulate Phuket Rajabhat University, Chiang Mai University and Chiang Mai Rajabhat University for hosting this conference. My personal respect and thanks go to all participants. Please enjoy the friendship, enjoy the culture of Thailand! I wish you an enjoyable and memorable conference in Phuket.

Khawp khun khap!

Prof. Dr. Tafdil Husni
Rector of Andalas University



OPENING AND WELCOME MESSAGE BY CONFERENCE COORDINATOR

Assoc. Prof. Sermkiat Jomjunyong, Ph.D.,
Country Coordinator of SAFE-Network (THAILAND)
Faculty of Engineering, Chiang Mai University.



Prof. Dr. Tafdil Husni, Asst. Prof. Dr. Hiran Prasarnkarn, Dr. Alberto N. Naperi and Prof. Dr. Novizer Nazir,
Distinguished participants, Ladies and Gentlemen:

It gives me a great pleasure to welcome all of you and chair the Opening Ceremony this morning to the "International Conference on Sustainable Agriculture, Food, and Energy (SAFE 2019) Green Agri-food Energy Production for a Better World in a Changing Climate" which will be held from October 18th - 21st, 2019, Phuket, Thailand. The host institution is jointly organized by SAFE Network, Chiang Mai University, Chiang Mai Rajabhat University, Phuket Rajabhat University, THAILAND and ANDALAS University, INDONESIA.

SAFE Network is an Asia Pacific network of university and college educators, researchers, and activists, who collaborate in analysis, synthesis, connecting and educating the people for a better economy, ecology, and equity in agriculture, food and energy system.

This conference is the seventh conference since the year 2013 to 2018. The SAFE 2019 conference will provide us not only essential knowledge but also a great opportunity to share experiences both technical and regulatory issues.

I would like to take this opportunity to express my sincere thanks to the organizers and in particular our honorable speakers. All of them have been working with us since the beginning of the planning stage and they are still here today for all of us, even though they are both very busy with their responsibilities at their agencies. We truly appreciate your dedication. Again, this conference program could not have been made possible without SAFE Network and Phuket Rajabhat University, THAILAND.

Finally, this is an opportune time for me to declare the official opening of the "SAFE 2019" and I wish all 4 fruitful days of interesting and beneficial program and also that you have a pleasant stay in Phuket.

I warmly welcome you again.

Assoc. Prof. Sermkiat Jomjunyong, Ph.D



WELCOME SPEECH BY PRESIDENT OF PHUKET RAJABHAT UNIVERSITY

Welcome All delegates,

I am pleased to welcome you to this landmark conference on the International Conference on Sustainable Agriculture, Food, and Energy (SAFE2019): Green Agrifood Energy Production for a Better World in a Changing Climate" which held from October 19-21, 2019 in Phuket, Thailand. Through this conference, we would like to engage with all of you in an open and constructive dialogue about resources and opportunities to interact with prominent leaders in the field of sustainability and greatly expand your global network of scholars and professionals. This event aims to bring together people from different areas and interests to share ideas, explore various discussions, maintain existing connections, establish new connections and partnerships, and share the achievements of the work.

I am honored and delighted to greet you all at the 7th International on Conference Sustainable Agriculture, Food, and Energy or SAFE 2019. For this The conference which brings together experts and academics from around the world, especially ASEAN Country. There are many sessions regarding keynote speech, oral presentation, and poster presentation etc. You can network and learn with the professionals in this conference.

I would like to thank you to our partners with the good relationship for long time. I am happy to see all of delegates in this international conference. I am sure that everyone will find the conference and your stay in Phuket both valuable and enjoyable.

Asst. Prof. Hiran Prasankarn, Ph.D.
President of Phuket Rajabhat University.

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HP:+66 53 885 871. E-mail: worajit@gmail.com

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SAFE2019 PROGRAM

DAY 0: Thursday, October 17 2019

ARRIVAL OF PARTICIPANTS AND SECRETARIAT MEMBER & CHECK IN HOTEL: METROPOLE PHUKET HOTEL

DAY 1: Friday October 18 2019

PHI PHI ISLAND TOUR

SAFE Secretariat arrange Phi Phi Island Tour/participants should pay)

DAY 2: Saturday, October 19, 2019

10.00-12.00 AM | NETWORKING DISCUSSION

Agenda: Virtual Farm Academy, Conference, Workshop, Summer Course, Collaboration

Venue: METROPOLE PHUKET Hotel, THAILAND

01.00-09.00 PM | PRE-CONFERENCE TOUR (FREE FOR PARTICIPANTS)

Starting Point: METROPOLE PHUKET Hotel, THAILAND

DESTINATION: Phuket Old Town, Karon View Point, Big Buddha, Wat Chalong Temple, Promtep Sunset, Chilva Market

07.30-09.45 PM | WELCOME DINNER:

SAFE Network will provide food and drink

Registration: OC will provide conference kits

Venue: METROPOLE PHUKET Hotel, THAILAND

08.15-08.30 PM | INVITED SPEAKER

AGRICULTURE, FOOD, ENERGY, AND SUSTAINABILITY IN NEPAL

Prof. Dr. Megh Raj Pokhrel

Central Department of Chemistry, Tribhuvan University, Kirtipur, Kathmandu, Nepal

Venue: METROPOLE PHUKET Hotel, THAILAND

DAY 3: Sunday, October 20, 2018

VENUE: PHUKET RAJABHAT UNIVERSITY, PHUKET-THAILAND

		Opening Ceremony Venue: PKRU CONVENTION HALL Person in Charge/MC: Dr. Worajit Setthapun, AeJcET, Chiang Mai Rajabhat University, THAILAND
	7.30-8.00 AM	Registration
8.15-8.25	Thailand National Anthem Indonesia National Anthem	
8.25-8.30	Conference Program Introduction by Local Conference Coordinator, Dr. Serklyat Jomjunyong, SAFE-Network National Co-ordinator (THAILAND). CHIANG MAI UNIVERSITY (CMU), THAILAND	
8.30-8.35	Welcome Remark from Rector of Andalas University, Prof. Dr. Tafdil Husni	
8.35-8.40	Opening Remark from President of Phuket Rajabhat University, THAILAND. Asst.Prof.Dr. Hiran Prasarnkarn	
8.40-9.00	Book Launching on <i>The Miracle Tree of Moringa I</i> , Co-writers: Dr. Ravindra Joshi and Dr. MC. Palada Presentation of Certificate of Appreciation and Special Gift from Prof. Dr. Novizar Nazir (SAFE-Network) to the host of SAFE2019: Andalas University, Chiang Mai University (CMU), Phuket Rajabhat University (PRU). Special Gift for Local Conference Coordinator Assoc. Prof. Dr. Sermklyat Jomjunyong, and Local Conference Secretary, Dr. Worajit Setthapun, Official Photo Session.	
KEY NOTE ADDRESS: Session Chair: Dr. Norman de Jesus, (Country Coordinator, Philippines). Pampango State Agricultural University, Philippines		
9.00-9.30	The Concept of Virtual Farm Academy Prof. Dr. Helmi, Andalas University-Indonesia Dr. Hanilyn Hidalgo, Central Bicol State Agricultural University (CBSUA), Philippines	
9.30-9.40	Discussion	
9.40-9.45	Signing Ceremony of Letter of Intent on the Establishment of Virtual Farm Academy between SAFE-Network and CBSUA, Philippines	
9.45-10.00	COFFEE BREAK	
Plenary Session I Venue: Main Conference Room Emerging Technology in Agriculture and Food		Plenary Session II Venue: Asian Workshop on Sustainable Energy

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	<p>Session Chair: Prof. Dr. Manggala de Chatura, (Country Coordinator, Sri Lanka), University of Ruhuna, Sri Lanka</p>	<p>Session Chair: Dr. Worajit Setthapun, AdICET, Chiang Mai University, Thailand Note: The time allocated for each speaker is 20 minutes, consisting of 15 minutes for presentation and 5 minutes for question and answer</p>
10.10-10.30	<p>INVITED SPEAKER 1:</p> <p>EMERGING PLASMA TECHNOLOGY FOR NEXT GENERATION AGRICULTURE AND FOOD PROCESSES</p> <p>Prof. Jeon Geon Han Thai-Korea Collaboration Research Center, Chiang mai University, Thailand Center for Advanced Plasma Surface Technology, Sungkyunkwan University, Republic of Korea</p>	<p>INVITED SPEAKER 5:</p> <p>TOWARD SUSTAINABLE TRANSPORT VIA ASEAN FUEL ECONOMY ROADMAP Dr. Nuwong Chollacoop Lab Head, Renewable Energy Laboratory National Metal and Materials Technology Center (MTEC), National Science and Technology Development Agency, Thailand</p>
10.30-10.50	<p>INVITED SPEAKER 2:</p> <p>SUSTAINABLE DRYING SYSTEMS FOR AGRICULTURAL CROPS IN RURAL COMMUNITIES</p> <p>Romualdo C. Martinez, Ph.D. Chief Science Research Specialist Philippine Center for Postharvest Development and Mechanization (PhilMech) Muncz, Nueva Ecija, Philippines</p>	<p>INVITED SPEAKER 6:</p> <p>CONVERSION OF AGRI-WASTE INTO BIOMASS ENERGY INTEGRATED WITH MICROGRIDS Assoc.Prof. Keng-Tung Wu, PhD Director, Industry Promotion Office for Southeastern Asia (IPOSA) Head, Planning & Marketing Division, International College of Innovation and Industry Liaison (ICIL), National Chung Hsing University, Taichung, Taiwan (ROC)</p>
10.50-11.10	<p>INVITED SPEAKER 3:</p> <p>ENABLING ENVIRONMENT FOR ENTREPRENEURSHIP & DISRUPTIVE TECHNOLOGY Dr. Wibool Piyawattanametha Director, Advanced Imaging Research Center Department of Biomedical Engineering, Faculty of Engineering King Mongkut's Institute of Technology Ladkrabang (KMITL), Thailand</p>	<p>10.50-11.00 Presenter 1:</p> <p>AN OVERVIEW OF COMMUNITY EMPOWERMENT BY SOLAR ENERGY Dr Vivek Mandot V. K. B. Government Girls' College, Durgapur, Rajasthan 314001, India</p> <p>11.00-11.20 Presenter 2:</p> <p>COMPOSITIONAL ANALYSES OF SELECTED LIGNOCELLULOSIC BIOMASS FROM MALAYSIA AGRO-WASTE USING VAN SOEST METHOD Dr. Masita Mohammad Solar Energy Research Institute, SERI, UKM, Malaysia</p> <p>11.20-11.30 Presenter 3:</p> <p>PRODUCTION OF BIOGAS FROM PALM OIL MILL EFFLUENT WITH INDIGENOUS BACTERIA Prof. Dr. Muhammad Said Chemical Engineering Department, Faculty of Engineering, Universitas Sriwijaya</p>
11.10-11.30	<p>INVITED SPEAKER 4:</p>	

	TRANSFORMATION OF GADONG TUBER STARCH INTO SOPHISTICATED MATERIAL Assoc. Prof. Dr. Azwani Mat Lazim Universiti Kebangsaan Malaysia, Malaysia	
11.30-12.00	DISCUSSION	11.30-13.00 Venue: Room1 Presentation: Energy-005 Energy 06 Energy 07 Energy 08 Energy 09 Energy-011 Energy 013 Energy 014 Energy 015 Energy 010 Energy 017 Energy 019 Energy 020 Energy 021 Energy 023 Energy 024 Energy 025 GPI-97
12.10-13.30	BREAKOUT SESSION 1 Venue: Room 1-8	
13.00-14.00	LUNCH BREAK	

DAY 3: Sunday, October 20, 2018

VENUE: PHUKET RAJABHAT UNIVERSITY, PHUKET-THAILAND

12.05-13.00 Breakout Session 1 (Previous Speaker will invite the next speaker to present, etc) CHAIR: Dr. Ravindra Joshi, Country Coordinator (Fiji and Pacific Island) Secretary: Dr. Rahmanta Setiahadi (Merdeka University of Makassar, Indonesia)								
Parallel Session	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7	Room 8
12.05-12.15	Energy	THE REGIONAL LAND USE CONTROL FOR SUSTAINABLE AGRICULTURE. Melinda Noer, Andalas University, Indonesia	BIOFERTILIZERS INCREASES THE GROWTH AND YIELD OF EDAMAME SOYBEANS ON THE COASTAL SOIL OF BENGKULU, INDONESIA Abimanyu Dipo Nusantara, Univ. Bengkulu, Indonesia	CATECHIN, EPICATECHIN AND EPIGALLOCATECHIN CALLATE OF GAMBIR TEA WITH TELANG PIGMENT. Tuty Anggraini, Andalas University, Indonesia	THE HEURISTIC COMPONENTS OF CATTLE PRODUCTION FOR SOLVING THE HAZE IN CHIANG MAI Semkiat Iomanyong, CMU, Thailand	SOLATION AND CHARACTERIZATION OF POTENTIAL PROBIOTIC YEAST FROM FISH FERMENTED Yetti Marlida, Andalas University, Indonesia	VOLUME AND AVAILABILITY OF BANANA AND WATER LILY AND THEIR UTILIZATION AS FEED INGREDIENTS FOR GOATS IN ULZON, PHILIPPINES. Norman de Jesus, PSAU, Philippines	EFFECTS OF <i>BACILLUS THURINGIENSIS</i> -BASED BIO-INSECTICIDES ON THE PRESENCE OF INSECTS AND THEIR LEVEL OF ATTACK ON MELON FRUIT CULTIVATION IN POLYBAGS Yulia Pujlástuti, Unsri, Indonesia
12.15-12.20	Energy	GPI-01	AST-01	PD-02	Environment-15	FST-02	GPI-11	AST-11
12.20-12.25	Energy	GPI-02	AST-02	PD-03	Environment-16	FST-05	GPI-12	AST-12
12.25-12.30	Energy	GPI-03	AST-03	PD-06	Environment-17	FST-06	GPI-12	AST-13
12.30-12.35	Energy	GPI-04	AST-04	PD-08	Environment-18	FST-07	GPI-14	AST-14
12.35-12.40	Energy	GPI-06	AST-06	PD-10	Environment-19	FST-08	GPI-17	AST-15
12.40-12.45	Energy	GPI-07	AST-09	PD-12	Environment-20	FST-09	GPI-18	AST-16
12.45-12.50	Energy	GPI-08	AST-10	PD-14	Environment-21	FST-10	GPI-20	AST-17
12.50-13.00	Q&A	Q&A	Q&A	Q&A	Q&A	Q&A	Q&A	Q&A

14.00-15.35 Breakout Session 2 (Previous Speaker will invite the next speaker to present, etc)
Chair: Assoc. Prof. Dr. Nurul Hudā, Country Coordinator (Malaysia)
Secretary: Dr. Leily Nurul Komariah (Sriwijaya University, Indonesia)

Parallel Session	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7	Room 8
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KEY POINTS/HIGHLIGHT FROM THE SESSIONS

Dr. Worajit Setthapun (CMRU, Thailand), Local Conference Secretary
 Dr. Helen Martinez, SAFE2019 Networking Meeting Secretary, PhilMech, Philippines
 Dr. Irawati Chaniago, SAFE-Network Secretary, Andalas University-INDONESIA
 Closing Message: Dr. Sermkiat Jonjumnyong, Local Conference Coordinator, CMU, Thailand

- AST-Agricultural Science and Technology |
- FST-Food Science and Technology |
- PD-Product Development |
- GPI-Green Production and Innovation |
- Energy-Energy |
- Environment-Environment |

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Wahyu	Faculty of Agriculture, Universitas Jambi	IDENTIFICATION OF GENETIC CHARACTERISTICS OF LOCAL RICE FIELDS OF ORIGIN JAMBI	AST-05
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Nuwong Chollacoop	Lab Head, Renewable Energy Laboratory, National Metal and Materials Technology Center (MTEC), National Science and Technology Development Agency, Thailand	Toward sustainable transport via ASEAN fuel economy roadmap	INVITED SPEAKER
Assoc. Keng-Tung Wu, PhD	Director, Industry Promotion Office for Southeastern Asia (IPOSA) Head, Planning & Marketing Division, International College of Innovation and Industry Liaison (ICIL), National Chung Hsing University, Taichung, Taiwan (ROC)	Conversion of Agri waste into Biomass Energy Integrated With Microgrids	INVITED SPEAKER
Hanilyn Hidalgo	Central Bicol State University of Agriculture (CBSUA), Philippines	The Concept of Virtual Farm Academy	INVITED SPEAKER
Jeon Geon Han	Thai-Korea Collaboration Research Center, Chiang mai University, Thailand Center for Advanced Plasma Surface Technology, Sungkyunkwan University, Republic of Korea	Emerging plasma technology for next generation agriculture and food processes	INVITED SPEAKER
ROMUALDO C. MARTINEZ, PhD.C	Philippine Center for Postharvest Development and Mechanization (PHilMech), Muncz, Nueva Ecija, Philippines	Sustainable Drying Systems for Agricultural Crops in Rural Communities	INVITED SPEAKER
Wibool Piyawattanametha	Director, Advanced Imaging Research Center Department of Biomedical Engineering, Faculty of Engineering King Mongkut's Institute of Technology Ladkrabang (KMUTL), Thailand	Enabling Environment for Entrepreneurship & Disruptive Technology	INVITED SPEAKER
Megh Raj Pokhrel	Central Department of Chemistry, Tribhuvan University, Kirtipur, Kathmandu, Nepal	Agriculture, Food, Energy, and Sustainability in Nepal	INVITED SPEAKER