

SFRN 2019

Security in
food,
renewable
resources,
and
natural
medicines



PROCEEDING

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**3rd INTERNATIONAL CONFER-
ENCE ON SECURITY IN FOOD,
RENEWABLE RESOURCES, AND
NATURAL MEDICINES 2019
(SFRN 2019)**

Convention Hall Politeknik Pertanian Negeri Payakumbuh
INDONESIA



hosted by,
Politeknik Pertanian
Negeri Payakumbuh



co-Hosted by,
Universitas Andalas
(UNAND)

QUANTUM-LEAP OF AGRI-FOOD SYSTEM 4.0 AND DELIVERY OF SUSTAINABLE DE- VELOPMENTS GOALS (SDGS)

September 25-26, 2019



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Theme:
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SUSTAINABLE DEVELOPMENTS GOALS (SDGS)”**

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Welcome Message
**Executive Chairman of The 3rd International Conference on Security in Food,
Renewable resources, and Natural Medicines (SFRN) 2019**



Dear Honorable ladies and gentlemen,

Good Morning and Assalamu'alaikum wr.wb

On behalf of the SFRN 2019 organizing committee, I am really honoured and delighted to welcome all of you to the 3rd International Conference on Security in Food, Renewable resources, and Natural Medicines (SFRN) 2019 at the State Polytechnic of Agriculture Payakumbuh, West Sumatra Indonesia

Our technical program is rich and varied with 8 keynote speeches and 4 invited talks and more than 170 technical papers split between 8 parallel oral sessions and 1 poster sessions. The speakers and participants came from 8 different countries, consist of Academicians, Scientists, Researchers, Practitioners, Professionals, and Government Officials in multidiscipline branch of knowledge, who gathered here today to share and discuss new findings and applications of innovations for promoting Food Security, Renewable Energy, Sustainable Resources and HealthCare Free for All, in particular for those who in needs. As the chairman of conference 2019 SFRN, I know that the success of the conference depends ultimately on the how many people who have worked in planning and organizing both the technical program and supporting social arrangements. This year, the conference is jointly organized by the Payakumbuh State Agricultural Polytechnic and Andalas University. We also thank to the steering committee for their wise and brilliant advice on organizing the technical program; and also to the the Program Committee, both from the Payakumbuh State Agricultural Polytechnic and Andalas University, for their thorough and timely reviewing of the papers and to the Director of Payakumbuh State Agricultural Polytechnic and the rector of Andalas University, and the Head of the Institute for Research and Community Service of Andalas University, and Payakumbuh State Agricultural Polytechnic. Our recognition should go to the Organizing Committee members who have all worked really hard for the details of the important aspects of the conference programs and social activities, and then we extend our gratitude to our students who bore the arduous burden for preparing this event.

We hope this event is also a good step in gaining strengthened cooperation between our universities as we know that the State Agricultural Polytechnic of Payakumbuh is part of the Andalas University previously, of course the psychological relationship between the State Agricultural Polytechnic and the Andalas University is really close.

Finally on behalf of the committee, we apologize profusely for all the shortcomings and everything that is not properly in organizing this event and hopefully AES-Network contributes significantly to the research and technology for the good of humanity.

Thank you

Fithra Herdian, S.TP, MP

**Message from Afro-Eurasia Scientific (AES) Network
3rd International Conference on Security in Food, Renewable resources, and
Natural Medicines (SFRN) 2019**



Dear Honorable and Distinguished guests,
Ladies and gentlemen,

Assalamu'alaikum Warahmatullahi Wabarakatuh and Good Morning

On behalf of the AES Network, I am honored and delighted to welcome you to the 3rd International Conference on Security in Food, Renewable resources, and Natural Medicines (SFRN) 2019 at the Agricultural State Poly Technique of Payakumbuh, Indonesia. I believe we have chosen a venue that guarantees a successful technical conference amid the culture, delicacy and scenery of Payakumbuh, the city of "Rendang".

The AES-Network aims to Promote Livelihood Through Food Security, Promote Future Smart and Green Mobility by Using Renewable Energy, Promote Prosperity by Equally Managing and Distributing the Sustainable Resources and Promoting Enjoyable Long-Life by using Natural Medicines With Free Health Care For All. The AES-Network was established in 2018 and already have memberships from 12 countries. Our members consist of Academicians, Scientists, Researchers, practitioners, professionals, and government officials from multidiscipline branch of knowledge, who gathered and contributed their expertise to share and discuss new findings and applications of innovations for promoting Food Security, Renewable Energy, Sustainable Resources and Free Health Care for All. In particular, the network aims to alleviate the condition of those who in dire needs. In the future, we also expect to provide technical demonstrations, and numerous opportunities for informal networking for Promoting Food Security, Renewable Energy, Sustainable Resources and Free Health Care for All. In this opportunity, we invited you to become our members and join our efforts for a better life to all of mankind.

As a team, we acknowledge the existence of mutual interest among university and college educators, researchers, activists, business sector, entrepreneurs, policy

makers, and all society members. We must promote the need to strengthen cooperation for establishing Security in Food, Renewable Resources, and Natural Medicines in Africa, Europe, and Asia.

The AES-Network believe, a firm foundation for mutual collaboration with the spirit of equality and partnership and thereby contribute towards sustainable development in these three regions.

Therefore, through networking, friendships, and joint efforts, the capacity of our network can be enhanced to address major challenges in securing the Food, Renewable Resources, and Natural Medicines in Africa, Europa, and Asia. Our Network goals are to increase the awareness of educators, researchers, scientific community, business sector, entrepreneurs, and policy makers in Africa, Europa, and Asia, that the future of a better world, lies within their responsibilities, and to improve the networking, mobility and mutual collaboration of scientific community, business sector, entrepreneurs, and policy makers in Africa, Europe, and Asia to energize the delivery of Sustainable Development Goals.

Finally, I hope that, by registering our network, you will be provided a common platform and support the exchange of knowledge, while at the same time, we offer constructive dialogue across and within the various interest and stakeholder groups, including the intended beneficiaries, and arrived at the best solutions to our terminal goal, Promoting Food Security, Renewable Energy, Sustainable Resources and Free Health Care based on scientific evidence in Africa, Europa, and Asian region.

Thank You for Joining us!

President

Assoc. Prof. Dr. Eng. Muhammad Makky

Welcome Message
Head of Institute for Research and Community Service
Universitas Andalas



Dear Honorable and Distinguished guests,
Ladies and gentlemen,

Assalamu'alaikum Warahmatullahi Wabarakatuh and Good Morning

It is with great pleasure that I welcome the participants of the SFRN 2019 in Payakumbuh, the city of “Rendang”, the prime of Indonesian delicacy.

In this esteem event, we share the knowledges, and imparted it to the people. The quest for knowledge has been from the beginning of time but knowledge only becomes valuable when it is disseminated and applied to benefit humankind. It is hoped that this conference will become a platform to gather and disseminate the latest knowledge which can be adopted for securing the food, resources, and health for mankind, in Asian, European and African region.

Academics, Scientists, Researchers and practitioners from multidiscipline branch of knowledge who gathered here today will be able to share and discuss new findings and applications of innovations for ensuring food security, in particular for those who reside in developing countries. It is envisaged that the intellectual discourse will result in future collaborations between universities, research institutions and industry both locally and internationally. In particular it is expected that focus will be given to issues on environmental and sustainability. Therefore, we urge to all participants, to establish a scientific network that will voice the needs

Researchers in the multi sectoral aspects related to the benefit of mankind have been progressing worldwide. Food is a basic right, while energy drive the world. Human need a lot of resources so the civilization can be flourished. But human is not immune, and thus, ones need to take care of their health regularly. Modern Agri-food systems is the foundations of a decent life, a sound education and the achievement of

the Sustainable Development Goals. Over the past decade, we have witnessed a chain reaction that threatens the very foundations of life for millions of the world's people. Rising energy prices drove up the cost of food and ate away the savings that people otherwise would have spent on health care or education. Unsustainable plantation management induced forest fire and posed haze hazard to the whole Sumatra island and our neighboring countries.

The human cost of the food and energy crisis has been enormous. Millions of families have been pushed into poverty and hunger. Thousands more suffering from the collateral effects. Over the past year, food insecurity led to political unrest in some 30 countries. Yet because the underlying problems persist, we will continue to experience such crises, again and again -- unless we act now. That is why we are here today.

We must make significant changes to feed ourselves, and most especially, to safeguard the poorest and most vulnerable. We must ensure safety nets for those who cannot afford food, or energy, nor even a health service. We must transform agricultural development, markets and how resources is distributed. We must do so based on a thorough understanding of the issues. That is the only possible way we can meet the Goals of Sustainable Development.

Thank You,

Assoc. Prof. Dr.-Ing. Uyung Gatot S. Dinata,MT.

**Opening Ceremony
Rector of Andalas University**



Dear Honorable and Distinguished guests,
Ladies and gentlemen,

Assalamu'alaikum Warahmatullahi Wabarakatuh and Good Morning

I welcome the opportunity to address you at this important event.

It gives me great pleasure in welcoming you to this 3rd Conference on "Security in Food, Renewable resources, and Natural Medicines (SFRN)" 2019. I am delighted that so many have accepted our invitation. I am particularly happy that we have in this room, dedicated individuals from so many stakeholder groups — including our most respected and distinguished guest “The ministry of Agriculture of the Republic of Indonesia”. We also welcome the mayor of Payakumbuh and the Regent of Lima Puluh Kota. We extend our welcome to the civil society, the private sector, international organizations; the science community; and others dedicated to help create an environment in which people can escape food insecurity. Imagine what we can do together if we make the security for all as an our top priority, and pull in the same direction. We can make a difference in the lives of millions.

Food is a basic right. Food security are the foundations of a decent life, a sound education and the achievement of the Sustainable Development Goals Access to medicines - a fundamental element of the right to health. Health is a fundamental human right, indispensable for the exercise of many other rights in particular the right to development, and necessary for living a life in dignity. Moreover, human rights principles and language are being used to support resource access claims as rights-based approaches empower individuals and groups to gain or maintain access to natural resources

Much progress has been made during the last decades but much more needs to be done. Millions of people are Insecure worldwide, meaning that they either starve or they do not know from where their next meal, health care or resources will come.

Much of the progress on security has occurred at the expense of our environment. With business as usual, we foresee that the production improvements during the next decade will be less than the last one, while the environmental degradation will continue, and health will deteriorate significantly. Without available resources to seek, mankind will become endanger species in a very short time.

Solutions to the security problems need to be designed and implemented within a new and rapidly changing environment. Globalization and sweeping technological changes offer new opportunities for solving these problems. A number driving forces or trends must be taken into account in developing appropriate action. Some of the action needed, such as appropriate technology for small farms, is not new but it must be cast in the new and changing global and national environment, taking into account new opportunities and risks. I hope that by providing a forum for knowledge exchange, this conference will help identify the action to be taken. Furthermore, this conference will help to provide constructive dialogue across and within the various interest and stakeholder groups, including the intended beneficiaries, and arrive at the best solutions.

In conclusion, even if those responsible give high priority to achieving sustainable security for all and back it up with action, the world may not achieve the goal by 2030. But we will be much closer than with business as usual. I urge all of us to provide the strongest support for this event, to enable securing the food for all in the closest time possible. It is my sincere optimism that through the accomplishment of the objectives of this event, we will come to an important step nearer to secure the food for all.

Finally, I would like to thank the organizing committee who have spent their utmost efforts to prepare and manage this event successfully. Let me conclude my remarks by wishing our guests happiness, good luck and great success in the conference.

May I announce now the opening of the “3rd International Conference on Security in Food, Renewable resources, and Natural Medicines (SFRN) 2019” in Payakumbuh.

Thank you.

Rector,
Prof. Tafdil Husni, SE, MBA, PhD

Welcome Message
Director of Politeknik Pertanian Negeri Payakumbuh



Dear Honorable ladies and gentlemen,

Good Morning and Assalamu'alaikumwr.wb

I congratulate to all participants on the invitation and participate at our beloved campus Payakumbuh State Agricultural Polytechnic. I feel really honoured to welcome all of you at our event, the 3rd International Conference on Security in Food, Renewable Resources, and Natural Medicines (SFRN) 2019 at the Payakumbuh State Agricultural Polytechnic, Indonesia.

Food security is a very important aspect in a country's sovereignty. Food also determines the future direction of a nation. Many social and political fluctuation can also occur if food security is disrupted. Food availability that is smaller than its needs can create economic instability. This critical food condition can even endanger economic and national stability. In the current situation, there are many challenges in exteriorize food security, such as climate change, population, limited natural resources and other challenges both locally, regionally and globally.

Renewable resources are also our starting point to start sustainable development. Research on renewable resources is also very important as the solution in meeting the principles of sustainable development. As we know that Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainability is the foundation for today's leading global framework for international cooperation - the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs)

The discovery of treatment based on local culture also contributes greatly to the good of humanity. Unfortunately, there are still many treatments that have not been carried out by scientific research. So, through this conference we hope it can be a trigger to increase in traditional plant-based treatments that not go through complex

chemical processes, so that the effectiveness of the pillars can be further suppressed and also contribute to the community's economy.

Finally, I would like to express my gratitude to all people who involved in organizing this event and to all of stakeholders who have helped to make this event go on successfully. Please accept my apologize for any shortage, Assalamu'alaikumwr.wb.

Thank you

Ir. Elvin Hasman, MP

Table of Content

Committee	i
Welcome Message from Executive Chairman	iii
Welcome Message from AES-Network	v
Welcome Message from Head of Institute for Research and Community Service Universitas Andalas	vii
Welcome Message from Rector of Andalas University	ix
Welcome Message from Director of Politeknik Pertanian Negeri Payakumbuh	xi
Table of Content	xiii

Keynote/Invited Speakers

Freshness Evaluation of Leafy Vegetables with Based on the Cell Membrane Properties <i>Graduate School of Agricultural Science, Kobe University, 1-1 Rokkodai, Nada, Kobe 6578501, Japan</i> (Shinichiro Kuroki)	1
Composite Materials - An Insight to a New Era <i>Malnad College of Engineering, Hassan, Karnataka, India</i> (B. Yogesha)	2
Precisions of Tractor Operations with Soil Sensor Implementusing Manual and Autopilot-automated Steering Systems on Oil Palm Replanting Area in Malaysia <i>Faculty of Plantation & Agrotechnology Universiti Teknologi MARA Melaka branch, Jasin campus 77300 Merlimau, Melaka, Malaysia</i> (Mohammad AnasAzmi, Darius El Pebrian)	3
Precision Agriculture: Digitization in Farming <i>Smart Farming Technology Research Centre Department of Biological and Agricultural Engineering Deputy Dean of Postgraduate Studies Faculty of Engineering Universiti Putra Malaysia</i> (SamsuzanaAbd Aziz)	4
Sustainable-Resources-Based Smart-Mobility in ASEAN: a New Concept of the Next-Generation Green-Transportation <i>ASEAN-U.S. Science and Technology Fellow (2018/2019), Association of South East Asian Nations (ASEAN) Secretariat. Dept. of Agricultural Engineering, Universitas Andalas, Padang 25163, West Sumatra, Indonesia</i> (Muhammad Makky)	5

Parasitoid as a Biological Control Agent of Rice Bug (<i>Leptocorisa oratorius</i> Fabricius): Effort Towards Food Security <i>Department of Food Crop, Payakumbuh State Polytechnic of Agriculture. West Sumatra. 26271. Indonesia</i> <i>(Fri Maulina)</i>	6
---	---

Intelligence Farming for Sustainability <i>Department of Agricultural Engineering King Mongkut's Institute of Technology Ladkrabang (KMITL), Thailand</i> <i>(Vasu Udompetaikul)</i>	7
---	---

Parallel Sessions

A. Food Security

Abundance and Potential of <i>Erionata thrax</i> L (Lepidoptera; Hesperidae) as an Insect Vector <i>Ralstonia syzygii</i> subsp. <i>celebesensis</i> Cause of Bacterial Blood Disease in Barangan in Deli Serdang Regency North Sumatera Asmah Indrawaty, Suswati	A1
The Study of Chemical Quality and Sensory of Egg Rendang in Payakumbuh Deni Novia, Indri Juliyarsi, Sri Mulyani.....	A7
Revival of Shifting Cultivation Pattern in Subdistrict of Mapattunggul Selatan, Pasaman Regency, West Sumatera, Indonesia Juli Yusran, Yonariza, Elfindri, Mahdi, Rikardo Silaban	A18
The Diversity of flower-visiting insects (<i>Musa paradisiaca</i>) and the Potential as a Spreading Agent <i>Ralstonia syzygii</i> subsp. <i>celebesensis</i> on Barangan Banana, in North Sumatera, Indonesia Suswati, Asmah Indrawaty, Rosiman, Maimunah	A31
Potential of Indole Acetic Acid Producing Bacteria as Biofertilizer in Increasing Production of Corn (<i>Zea mays</i> L.) Yun Sondang, Khazy Anty, Netti Yuliarti, Ramond Siregar	A37
Analysis of Inpara 3 Variety of Seed Farming Production Firdaus, Adri, Erwan	A45
Growth and Results of Some Shallots Varieties in Two Ways of Planting in the Lowland Syafri Edi, Yardha.....	A53
Some Perspectives on Food Security For Children: The Case of Rendang For Kids in West Sumatera Dessy Kurnia Sari, Donard Games, Atha Raihan Rusdi.....	A62

Farmer's Adoption Level for Inpara 3 and Inpari 34 Newly Rice Varieties Experiment in Swamp Land Areas, Betara District, West Tanjung Jabung, Jambi Suharyon, Lutfi Izhar	A67
Palm Oil Seed Premeditated Acclaim in Jambi Lutfi Izhar, Arni Diana, Salwati.....	A76
Water Resources Potency for Supporting Location-Specific Agricultural Policies and Innovations Salwati, Lutfi Izhar.....	A81
Improvement of Local Bungo Cattle Calving Rate With Artificial Insemination Bustami, Zubir, E. Susilawati, Sari Yanti Hayanti	A93
Performance and Productivity of Rice and Corn Intercropping in Dry Land of Jambi Province Jumakir, Adri, Rustam	A101
Prospects of Superior Variety Cane "PoJ 2878 Agribun Kerinci" in Increasing Income Farmers in Kerinci District, Jambi Province Endrizal, Araz Meilin, Julistia Bobihoe.....	A110
Determining Factors and the Elasticity of Demand Chicken Eggs Household Consumer in Sijunjung Regency Noni Novarista, Nofrita Sandi	A119
Application of POC from Leachate Landfill on Growth and Yield of Maize (Zea mays) Hasnelly, Syafrimen Yasin, Agustian, Darmawan	A128

B. Natural Medicine

Utilization of Medicine Plants by Suku Anak Dalam (SAD) in Bukit Duabelas National Park Area of Sarolangun District, Jambi Province Julistia Bobihoe, Sari Yanti Hayanti Endrizal	B1
The Effect of Kawa Daun Gambir (Uncaria gambir Roxb.) on the Malondialdehyde (MDA) Level of Heart Alloxan Induced Hyperglycemia Mice Husnil Kadri, Muhammad A'raaf, Julizar.....	B9
Banana Extract (Musa paradisiaca) as Alternative Natural Antibacterial to Prevent Dental Caries <i>Asterina, Yustini Alioes , Ovy Prima Damara</i>	B15

The Difference in the Effectiveness of Propolis and Triamcinolone Acetonide in Traumatic Ulcer Healing in Mucosa of the Oral Cavity <i>Yustini Alioes, Hamdan, Elmatris,SY</i>	B21
--	-----

C. Policy, Commercialization And Innovation (PCI)

Strategies for Developing SMEs (Small and Medium Enterprises) of “Rendang” with Strengthening Regional Innovation Systems in Payakumbuh City <i>Amna Suresti, Uyung Gatot S. Dinata, Alizar Hasan, James Hellyward, Rahmi Wati</i>	C1
Attitude Towards Technology Adoption Among Permanent Food Production Park Program Participants in Peninsular Malaysia <i>Zulqarnain1, Norsida Man, Juwaidah Shariffudin, Salim Hassan</i>	C16
Nutrient Contents of Parboiled Rice as Affected by Palm Oil Addition <i>Cesar Welya Refdi, Gita Addelia Nevara</i>	C22
Production Factors Affecting Taro Production in Sinaboi Sub-District Rokan Hilir Regency <i>Eliza, Shorea Khaswarina, Ermi Tety</i>	C28
The Role of Various Types and Dosage of Biological Compost (Bio-Compost) on Biology and Soil Fertility in Ginger (<i>Zingiber officinale. L</i>) <i>Misfit Putrina, Yulensri, Kresna Murti</i>	C38
Community Partnership Program in Processing Cassava Into Mocaf on Woman Farmers in Petapahan District <i>Amelira Haris Nasution, Nirmala Purba, Salvia S</i>	C45
The Effect of Addition of Na_2CO_3 Solution Into the Decaffeination Process of Dry Coffee Seeds on Physicochemical Characteristics of Coffee Powder <i>Ruri Wijayanti, Malse Anggia</i>	C55
Enhancing Innovation Performance and Commercialization in Higher Education Institutions: The Case of Andalas University <i>Donard Games, Hanalde Andre, Amri Syahardi</i>	C62
Relationship Analysis of the Proportion of Food Expenditures with Food Security in Farmer Households in North Aceh Regency <i>Riyandhi Praza, Nurasih Shamadiyah</i>	C67

D. Sustainable Resources

Stock and Particulate Organic Matter of Ultisols Under Selected Land Use in Wet Tropical Area, Limau Manis West Sumatra, Indonesia Yulnafatmawita,, Syafrimen Yasin, Zainal A. Haris	D1
Base Analysis and Land Carrying Capacity For the Development of Buffalo in Sijunjung Regency M. Ikhsan Rias, Riza Andesca Putra, Fuad Madarisa	D10
Physical and Mechanical Properties of Pinang (Areca catechu, L.) Iriwad Putri1, Putri Wladari Zainal	D18
Analysis of Food Plants Intercropping on Acidic Dryland Adri, Jumakir, Rustam	D26
Utilization of Organic Material Insitu to Increase the Absorption N, P, K and Soybean Results on Gold Mining Fields in Sijunjung Districts Giska Oktabrina. S., Riza Syofiani.....	D34
Amelioration of the Land of Former Gold Mine By Providing Kirinyuh Weeds and Agricultural Waste to Increase Paddy Production in Sijunjung Regency Riza Syofiani.....	D41

Sustainable-Resources-Based Smart-Mobility in ASEAN: a New Concept of the Next-Generation Green-Transportation

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Abstract. The world is changing as transportation increases. Global trend showed that, major vehicle manufacturer changes their strategy. The paradigm shifts in transportation industry brought a new greener concept of mobility. Along with the economic boom in ASEAN countries, its oil demand is growing rapidly. The transport sector in ASEAN consumes approximately one-quarter of its energy consumption, and is over 90 per cent dependent on oil. Yet, oil stockpiling and other security measures have not been fully developed. Therefore, ASEAN countries are exposed to various risks of supply disruption. On the other hand, ASEAN is the major producer of palm oil. It contributes to almost 90% of world market. This edible oil can be processed into green fuel (Biodiesel) for supplementing the oil import from ASEAN countries. Biodiesel burns more efficiently and produces fewer emissions compared to Petro-diesel. Biodiesel can be used in the standard engine, and in some ASEAN countries it is a mandatory use. In Indonesia, a 20% of biodiesel (B20) is used in all diesel engines, mandatorily, and soon other ASEAN countries will follow this policy. In general, ASEAN countries are working towards realizing a common regional goal of intensifying renewable energy in the region's primary energy mix to 23 percent by 2025, where biodiesel will be among the preferable choice for transportation. Through this renewable energy mix strategy in transportation sector, ASEAN countries pledge to reduce their greenhouse gas emission by 30 percent by 2030. By utilizing the palm oil as a mandatory renewable fuel source, the new concept for the future transportation in ASEAN will become greener and nature friendly. Moreover, ASEAN oil palm producing countries have adopted a sustainable strategy for oil palm. This strategy will prevent deforestation and assist the livelihood of more than 30 million people in ASEAN, whose is dependent upon the palm oil industry. In addition, the Master Plan on ASEAN Connectivity 2025 targeted a seamless logistics to lower the costs and improve the speed and reliability of the supply chains in ASEAN. This will strengthen ASEAN competitiveness through enhanced trade routes, logistics, supply chain and improve efficiency through addressing key chokepoints. In conclusion, by promoting the green transportation in ASEAN based on Biodiesel from the oil palm, ASEAN can contribute to reduce emission and deforestation while at the same time enhanced its economy and industry. In addition, ASEAN seamless logistic will reduce the energy demand in transportation that will be beneficial to the livelihood of its people.

Keywords: Palm Oil, mobility, Biodiesel, renewable energy, GHG Emission, deforestation, sustainability, seamless logistic, livelihood.