

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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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

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Attitude Towards Technology Adoption Among Permanent Food Production Park Program Participants in Peninsular Malaysia

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Abstract. The study discovers that the Transfer and Adoption of high Technology in Permanent Food Production Park (PFPP) program participations in peninsular Malaysia. The PFPP program is one of the basic programs established by the government of Malaysia with the aims of increasing food production as well as reduces our food imports and auxiliary local agriculture entrepreneurs. The research employed a cross-sectional study design and was conducted in peninsular Malaysia. The supporting variables were hypothesized to influence the respondents' attitude towards technology adoption through PFPP. The results showed that the respondents that the main factors that influence respondents' attitudes towards technology adoption are the benefit of the technology application, education level of the respondent, the respondent's year of experience in agriculture, and the respondent's gross income.

Keywords: Technology Adoption, participants. Peninsular Malaysia

INTRODUCTION

Agriculture is one of the critical areas of a country's economy around the world since the agriculture sector provides basic resources for human civilization. Life itself depends on the agriculture sectors. The economic development of agriculture can also give many opportunities in generating income, employment, the greater number of labor use, initiating facilities construction in villages, and reducing the number of poverty in the developing countries. In 2008, the World Bank revealed that agriculture could be used for developing the sustainability of smallholder farming to solve poverty problems.

Technology plays an essential role in the agriculture sector and also ensures the food security of people around the world. It is widely understood that encouraging new technology such as machinery technology can reduce dependence on human labor. Machinery Technology is relatively more relevant to agriculture nowadays when compared to manpower due to time efficiency issues. The approach to reducing reliance on the human workforce strengthens the capacity of agriculture agents to adopt modern technologies and machinery. Technology for agricultural development

has been focusing on raising the use of usual vacant technologies to become applicable in agriculture sub-sectors. Real applications of advance and newly created technologies are expected to help farmers. The preliminary goal is to initiate the development of existing advance technologies, to be combined with the typical-existing technologies as well as frontier technologies. This target is needed to make technology becomes adaptable and applicable to enhance competition in the agriculture sector.

To increase agricultural productivity by research, development, and spreading of agricultural technologies, today, a lot of countries have started national research programs and institutions to identify and introduce agricultural technologies and management practices to farmers. Malaysian economic mechanism is concentrated mainly on the agriculture sector as stated in the ninth five-year plan of Malaysia, which emphasis is on agriculture as the third engine for the Malaysian economy. The most effort done to apply this approach was said to be in the large scale agriculture production where more use of technology is implemented to produce high quality and value-added products. This approach was also enriched with the integration of information and communications technology (ICT) to levitate farmers' innovative capabilities. Moreover, services from the government also needed to be simplified (Economic Planning Unit, 2006) to improve the quality and value of agriculture,

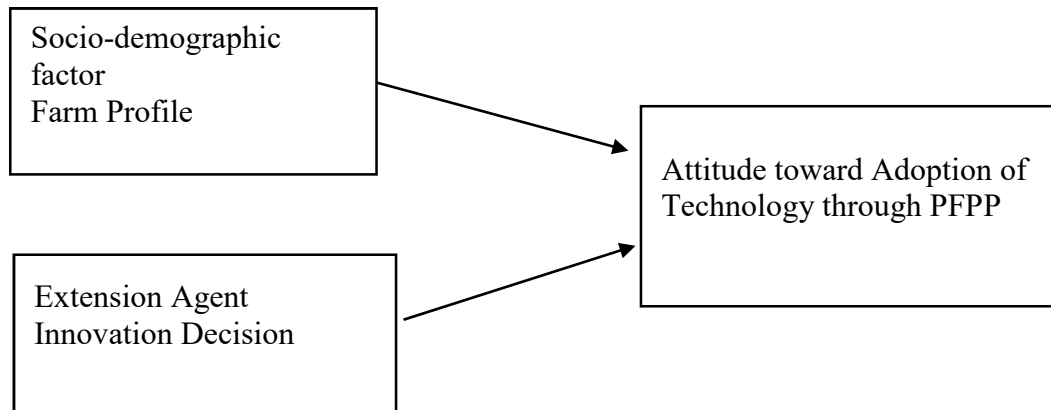
Malaysia's principal crops are rice, land grown foods, such as papaya, pineapple, banana, star fruit, and vegetables like chili pepper, cabbage, different kinds of Brassicas; Curcubits (cucumbers and its substitute products); Solanaceous products eg. tomato, eggplant, sweet pepper. Even though beans. Rice field is the largest area of agriculture in Malaysia, demonstrating 670,000 ha in 2010 (Department of Agriculture, 2010), followed by oil palm, elastic, coconut, and durian (FAO Country Report 2007).

Malaysian development is currently undertaking a mass introduction to science and technology. It was between 1986 and 89 the domestic science and technology agreement were initiated to be greater, stronger, and applicable toward a stronger economic development and social improvement. The main goal is to increase new ideas in research and development through the immersion of technology. The secondary objective was on the increasing process of bringing up ideas among individuals by creating better workplaces in general (Rahman, 2012). Transfer and adoption of technology hold the most crucial role in agriculture sector development. One of the most critical functions of agriculture extension is the dissemination of the natural or new technology by research and practical view in the form of papers and media. The transferring technologies and dissemination comprise two important keys components; adoption of technologies; and motivation for farmers. The transfer of technologies is delivered through posters, printed media, mass media, seminars, and training. The transfer process is required to be able to develop technologies in a distinct parameter, which is, at that time, transferred for use in another context (Market, 1993). The diffusion is used to state that the dissemination or use of technology in society, organization, or group of individuals (Rogers, 1995). Therefore, this study is focusing on the exploration of factors influencing attitude

towards technology adoption among permanent food production park program participants in West Malaysia.

MATERIALS AND METHOD

The conceptual framework showing factors influencing the adoption level of high technology in the study area is presented in Figure 1 below.



The following explanatory variables were hypothesized to influence the respondents' attitude towards technology adoption through PFPP:

Attitude: is a continuous variable measured in scores and represents the respondents' attitude towards technology adoption through PFPP. The attitude in technology adoption can be useful in connecting agricultural practices and technology adoption as agriculture is becoming more developed, and farm management becomes more complex. Therefore, respondents' attitude is expected to affect their point of view toward technology adoption, either positively or negatively.

Benefit: is a continuous variable measured in scores and represents the level of benefit of technology adoption through PFPP. It is expected that the benefit of technology adoption in agriculture may have an effect on technology adoption among the respondents.

Factors: is a continuous variable measured in a score and represents the score of factors affecting attitude towards technology adoption through PFPP. It is expected that these factors are the most important aspects of technology adoption in agriculture that may have an effect on technology adoption among the respondents. The factor influencing attitude toward technology adoption is becoming more complex.

In addition, descriptive analysis in terms of frequencies, mean, percentage, and rank order was employed to identify the respondents' attitude towards technology adoption and the factors affecting the attitudes. A comparison was also made using statistical methods to predict the respondents' attitude score based on five different models.

RESULTS

The multiple regression analysis was conducted to examine the factor that influences the respondents' attitude towards technology adoption through PFPP. The multiple regression analyses with all the predictors (age, educational level, family dependents size, years of experience in agriculture, farm size, gross income, net income, benefit score and knowledge and skills score) produce $R^2 = 0.487$, $F = 27.012$, $p < 0.001$ (Table 1 and 2).

Table 3. shows the regression analysis result. It depicts that gross income, knowledge, and skill and benefit scale had a significant positive regression value, indicating that respondents with a higher score on these scales were expected to have a higher score for their attitude toward technology adoption, after controlling for the other variables in the model. Meanwhile, education level and years of experience in agriculture had significant negative value, indicating that after accounting for gross income, knowledge and skill and benefit, respondents with higher educational levels and more years of experience in agriculture were expected to have lower scores for attitude toward technology adoption. Age, family dependents size, farm size, and net income did not contribute to the multiple regression model.

Table 1 Regression Analysis Result

Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	1.183	.288		.000
	Age	-.004	.002	-.084	.138
	Educational level	-.066	.019	-.177	.001
	Family Dependents Size	-.001	.011	-.003	.944
	Year of experience in agriculture	-.005	.003	-.119	.038
	farm size	.001	.002	.025	.584
	Gross income	2.752E-7	.000	.148	.017
	Net income	-2.422E-7	.000	-.054	.378
	Knowledge and Skill	.506	.059	.456	.000
	Benefit	.306	.053	.308	.000

Table 2 Analysis of Variance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.692 ^a	.478	.461	.42958

Table 3 Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.862	9	4.985	27.012	.000 ^a
	Residual	48.902	265	.185		
	Total	93.764	274			

DISCUSSION

The findings in the charts above show that the multiple regression analysis with all the predictors (age, educational level, family dependents size, years of experience in agriculture, farm size, gross income, net income, benefit score, and knowledge skills score) depicts that gross income, knowledge and skill and benefit scale has a significant positive regression value, indicating that respondents with higher score on these scales are assumed to have higher score for their attitude toward technology adoption. Meanwhile, education level and years of experience in agriculture had significant negative value, indicating that after accounting for gross income, knowledge and skill and benefit, respondents with a higher level of education and more years of experience in agriculture have a lower score for attitude toward technology adoption. Age, family dependents size, farm size, and net income did not contribute to the multiple regression model. Based on the findings, the main factors that influence respondents' attitude towards technology adoption are knowledge and skill, benefit, education level, year of experience in agriculture, and gross income.

CONCLUSION

Agriculture technology adoption is the most important factor in recent improvement for today's world. There has been an improvement in funding and development for agriculture research and development. The most important adoption of high technologies is very crucial, especially in developing countries. Machinery Technology is fundamental instead of manpower in the agriculture area due to more time efficiency. It has not been regarded as entirely successful due to a lack of information, cultural beliefs, and many other factors. Therefore, to promote research and enhancement of new practices and commercialization for better understanding, the results of this research can be utilized as advice for technology advancement to create better policies and techniques to develop technology adoption in the agricultural sector.

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