

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)**



hosted by,
Politeknik Pertanian
Negeri Payakumbuh



co-Hosted by,
Universitas Andalas
(UNAND)

Convention Hall Politeknik Pertanian Negeri Payakumbuh
INDONESIA

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

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Palm Oil Seed Premeditated Acclaim in Jambi

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Abstract. Research on the assessment for evaluation of Palm Oil seeds quality in Jambi Province was research supporting Jambi Provincial Government prompt development policies in addressing the constraints of the palm oil growing in Jambi. The objective of this research was to identify palm oil plantation conditions on smallholder plantations in Jambi Province. The research was conducted in 2017 by propelling field survey and secondary data usage conducted in selected districts as palm oil development centers such as West Tanjung Jabung, Merangin, and Bungo. The study involved particular villages with more than 200 farmers as an interview object and led FGDs at the district level. The results showed that the use of palm oil certified seeds in Jambi Province from 2010 to 2015 was included in the low category (30.66%). Therefore, a strategy to increase the use of high-quality oil palm seedlings on smallholder plantations in Jambi Province must be established through improving farmers' knowledge on technical and procedures, socializing seed institutions, and improving cooperation programs that have been launched by seed producers.

Keywords: *Seedling, Oil Palm, Regional Policy. Jambi*

INTRODUCTION

Estate farm has a vital role in the development of the Indonesian economy. Oil palm is one of a strategic national estate plantation commodity (Durianto, et al. 2004). The area of oil palm plantations in Jambi Province is 692,967 ha, with the production of 1,773,735 tons and productivity of 2.92 kg/ha (Dirjenbun, 2016; BPS, 2015). Until now, Jambi oil palm productivity is still low.

The low productivity of oil palm is influenced by several factors that are closely related to fruit productivity and CPO quality. The factors are genetic (seeds), technical culture (maintenance), and environmental factors (environmental suitability). The seed is one of the critical factors for the success of oil palm farming systems (Kamil, 1991; Sutopo, 2004.). Mistakes in seeds selection will affect fruit productivity and the quality of palm oil as CPO produced. According to the Indonesian Palm Oil Farmers Association (APKSI), low quality of oil palm seed or fake seed will produce low fruit productivity, ranging from 10-12 tons/ha/year FFB equivalent to 1.3 to 1.5 tons/ha/month. The estimated number of non-quality

seed/fake oil palm seeds used by farmers in Indonesia is currently estimated to be around 60% (BBPPT Perkebunan. 2016).

Through this paper, the existing conditions of oil palm seedlings on smallholder plantations in Jambi Province will be described, and policy options are defining in quality palm oil seeds developing in smallholder plantations, Jambi Province.

MATERIALS AND METHOD

The study was conducted in 2017 in Jambi Province by taking locations in 3 (three) districts, namely Merangin Regency, Bungo Regency, and West Tanjung Jabung Regency. Research data mainly using secondary data and supported by primary data. Selection of research locations using the Cluster Sampling Method in a professional manner that can represent all three regions based on geographical position (Silalahi, 2009).

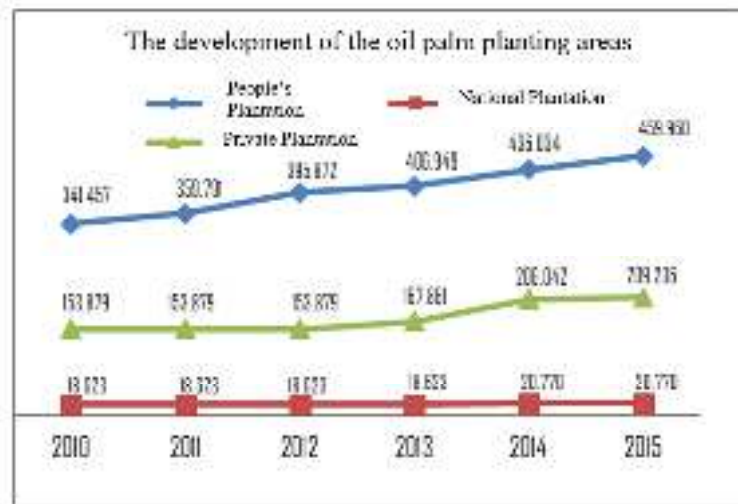
District locations were selected based on consideration of the three most extensive areas of smallholder oil palm plantations in each region in Jambi Province (Sugiyono. 2012). Merangin District represents the western region, Bungo District represents the central region, and West Tanjung Jabung Regency represents the eastern region. Location of sub-districts chosen by three sub-districts, which also has the most extensive area of oil palm plantations and the most significant number of farmers' considerations. The determination of samples of farmers was done by random sampling (Mardikanto. 2006; Arikunto, 2006).

Collecting and retrieving data was influenced by population and sample size (Engel, and Miniard. 1994). In order to find out the factors for the distribution of native and fake palm seeds, it was analyzed by using a SWOT analysis tool and then continued by using the TOPSIS analysis (Behzadian et al. 2012).

RESULTS AND DISCUSSION

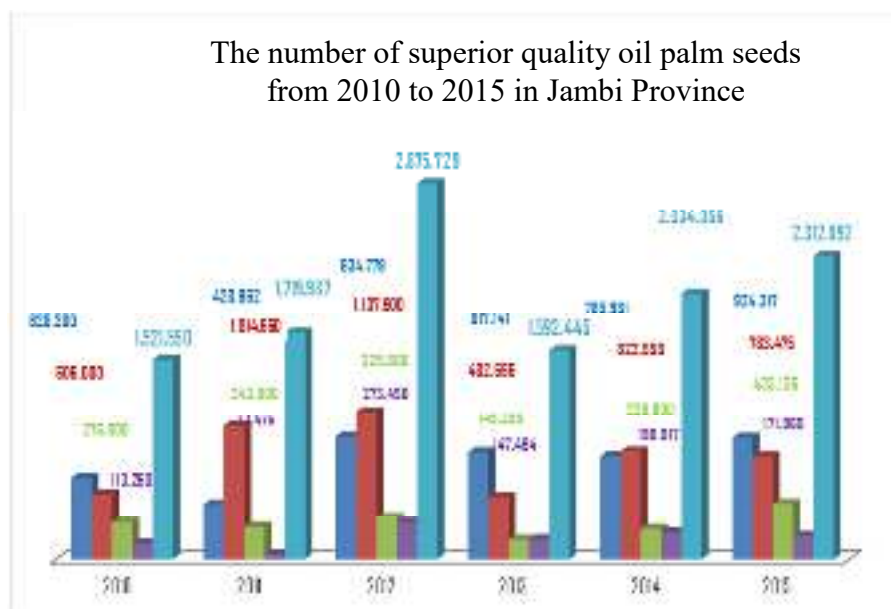
Oil palm plantations in Jambi Province are managed by the State Large Plantation (PBN), National Large Private Plantation (PBSN), and People's Plantation (Plasma PIR, KKPA Plasma, Plasma Bun and Partial private owner). The development of the oil palm planting area from 2010 to 2015 can be seen in Graph 1.

A. Food Security



Graph 1. The development of the oil palm planting area from 2010 to 2015 in Jambi Province

The superior quality of oil palm seeds from 2010 to 2015 in Jambi Province is produced by four official oil palm seed producers for Jambi Province, i.e. Medan PPKS, Medan Sucofindo, London Sumatra Medan, and BTN Batam). Their numbers can be seen in Table 2. The number of certified superior seeds produced by several companies for Jambi Province from 2010 to 2015 in Jambi Province was 12,056,659, with details of PPKS 4,519,480 items, and Sucofindo 4,746,038 items, London Sumatra 1,652,590 items, and BTN 938,551 items or equivalent to the planting area of 65,171, 12 ha if an average of 1 ha requires 185 items.



Graph 2. The number of superior quality oil palm seeds from 2010 to 2015 in Jambi Province

Table 1. Oil Palm Seed Assistance Through APBD I Provincial Plantation Service During 2010 up to 2016 in Jambi Province

Regions	Number of seed that already distributed						Jumlah
	2010	2011	2012	2013	2014	2015	
West Tanjung	5.000	500	6.000	6.315	23.034	13.550	54.399
East Tanjung	500	500	500	250	16.645	5.250	23.645
Batang hari	11.250	10.000	12.500	14.200	22.406	5.685	76.041
Muaro Jambi	7.200	10.000	10.000	10.600	35.355	17.340	90.945
Bungo	-	-	-	-	300	500	800
Tebo	-	-	-	-	-	625	625
Merangin	250	-	-	250	-	150	650
Sarolangun	1.000	1.000	-	1.500	2.875	9.525	15.900
jambi	4.800	4.250	4.500	4.585	2.175	2.850	23.160
Total	30.000	26.250	33.500	37.700	102.790	55.475	285.715

Data Source: Jambi Estate Farm Provincial Office, 2016

The government has attempted to suppress the development of imitation of oil palm seeds in Jambi Province, Bungo, Merangin, and West Tanjung Jabung districts. However, the types of activities vary. For Jambi Provinces, Merangin Regency, and West Tanjung Jabung Regency, the activity is in the form of joint palm oil seedlings while for the Regency Bungo is in the form of direct assistance. Table 1 above, shows that Jambi Province Certified Seed Assistance Program from 2010 and 2016 was 358,214 stems or equivalent to 2505 Ha, in Merangin District 1,122, 10 Ha, in Tanjung Jabung Barat Regency covering 543.74 Ha and Bungo in the form of direct assistance covering 35 ha with the calculation of 1 Ha, it requires 130 seedlings plus 10% force major. So the number of seeds needed per ha is 143 stems/ha. However, this number still cannot overcome the problem of using fake palm oil seeds (Statistik Perkebunan Provinsi Jambi, 2016).

The Jambi Provincial Government and Potential Regency Oil Palm Development offer some solutions so that the quality palm oil seeds/seeds are available at the farm level. First, increasing the number of procurement of quality seeds each year with the primary goal of oil palm crop rejuvenation. Second, encouraging companies as producers of oil palm seedlings that already have a program to bring seeds to the community, the PPKS, which has three programs, including the construction of oil palm seed outlets, seed franchises, and community oil palm programs (Prowitra). The Prowitra program has been initiated in Merangin Regency. However, according to the Merangin District Animal Husbandry and Plantation Service, the activity has been running, but the PPKS has not been coordinated, so it has not been monitored. Then for oil palm seed franchise activities according to PPKS, they have already collaborated with Batanghari Regency officers (BBPPT Perkebunan. 2016). Other efforts can be made to bring the seeds of society closer by preparing and fostering official oil palm seed breeders on the value of potential palm oil development (Kasali. 1998; Kotler, 2003).

CONCLUSIONS

1. The level of use of high quality (superior certified) oil palm seeds in Jambi Province from 2010 to 2015 is included in the low category of 30.66%.

2. The strategy offered as a policy option in accelerating the use of quality palm oil seeds in smallholder plantations includes:
 - a. Short term by prioritizing the use of quality oil palm seeds/seedlings in the area of oil palm rejuvenation and farmers who are willing to replace oil palm plants sourced from illegal seeds.
 - b. The medium/long term utilization of oil palm seeds/seedlings at smallholder plantations that are not yet willing to replace oil palm plants comes from illegal seedlings.

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