

Impact Factor:

ISRA (India) = 6.317
ISI (Dubai, UAE) = 1.582
GIF (Australia) = 0.564
JIF = 1.500

SIS (USA) = 0.912
PIHII (Russia) = 3.939
ESJI (KZ) = 9.035
SJIF (Morocco) = 7.184

ICV (Poland) = 6.630
PIF (India) = 1.940
IBI (India) = 4.260
OAJI (USA) = 0.350

SOI: [1.1/TAS](#) DOI: [10.15863/TAS](#)

International Scientific Journal Theoretical & Applied Science

p-ISSN: 2308-4944 (print) e-ISSN: 2409-0085 (online)

Year: 2021 Issue: 12 Volume: 104

Published: 29.12.2021 <http://T-Science.org>

QR – Issue



QR – Article



Toti Indrawati
University of Riau
Jl. Binawidya Km 12.5, 28291,
Pekanbaru Riau, Indonesia
Faculty of Economics and Business

Yelly Zamaya
University of Riau
Pekanbaru Riau, Indonesia
Faculty of Economics and Business
(Corresponding author)

Rosyetti
University of Riau
Pekanbaru Riau, Indonesia
Faculty of Economics and Business

Eriyati
University of Riau
Pekanbaru Riau, Indonesia
Faculty of Economics and Business

PEATLAND COMMUNITY ECONOMIC DEVELOPMENT STRATEGY IN BANGLAS BARAT VILLAGE, MERANTI ISLANDS, BASED ON THE QUINTUPLE HELIX INNOVATION MODEL

Abstract: Peatland management has its dilemma between meeting community needs and peatland sustainability. The use of peatlands without paying attention to the unique characteristics of the peat itself might make the peatlands degraded (dry), lose nutrients, and cannot return to their original condition. Riau Province is the second province that has the largest peatland in Indonesia, where the area of peatland is 3,864,414 Ha, or 60.1% of the peatland on the island of Sumatra. With an estimated peat thickness of less than 300 cm covering an area of 1,417,762 Ha (36.7%) and a thickness of more than 300 cm covering an area of 2,449,652 Ha (63.3%).

This study employed The Quintuple Helix Innovation Model. This model described the interaction between the five helixes/components between the government, peatland user industries, universities, the media, and the surrounding community for economic development to increase community income and the regional economy. The results of this study indicate that the community empowerment strategy in Banglas Barat Village based on The Quintuple Helix Innovation Method was currently unable to be implemented properly, and following the theory, because there were still limited main supporting facilities and infrastructure for the implementation of innovation. The fulfillment of the main facilities and infrastructure such as electricity, clean water, telecommunications, and transportation must be carried out immediately.

Of the five helixes involved, it is necessary to optimize research and service activities carried out by universities, provide business capital assistance to the community, optimize peatland protection with the aim of not changing the peat ecosystem, even though the community can still carry out economic activities on it, develop telecommunications and internet networks in villages, and optimize more intense socialization on regulations for preserving peatlands and regulations on community economic development. This is very necessary because peat villages have different characteristics both in terms of people and land.

Impact Factor:

ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
ISI (Dubai, UAE) = 1.582	PIIHQ (Russia) = 3.939	PIF (India) = 1.940
GIF (Australia) = 0.564	ESJI (KZ) = 9.035	IBI (India) = 4.260
JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

Key words: Community Empowerment, The Quintuple Helix Peatlands, Innovation Model.

Language: English

Citation: Indrawati, T., Zamaya, Y., Rosyetti, & Eriyati (2021). Peatland community economic development strategy in banglas barat village, meranti islands, based on the quintuple helix innovation model. *ISJ Theoretical & Applied Science*, 12 (104), 1280-1287.

Soi: <http://s-o-i.org/1.1/TAS-12-104-142> **Doi:**  <https://dx.doi.org/10.15863/TAS.2021.12.104.142>

Scopus ASCC: 2000.

Introduction

Peatland management has its dilemma between meeting community needs and peatland sustainability. The population continues to increase forcing people to meet their primary needs in the form of food, clothing, and shelter in the area they are in. From the various studies that have been carried out, there is a contradiction between the fulfillment of the primary needs of the community and the sustainability of the peat ecosystem. The use of peatlands without paying attention to the distinctive characteristics of the peat itself causes peatlands to be degraded (Masganti et al., 2014).

The use and development of peatlands have always been a matter of debate. Differences in views on the use of peatlands are divided into two aspects of interest, namely aspects of environmental interests and aspects of the importance of developing peatlands for strategic commodity agriculture. This condition requires interested parties to find a solution to achieve the balance between these two interests, including through the development of agriculture-based on community participation and land sustainability

(sustainable development of peatlands). One of the problems that occur in peatlands that result in damage to the function of the peat ecosystem is the lack of accuracy in the selection of commodities or economic sectors developed on the land. In the agricultural sector, commodities that are not following the characteristics of peatlands and the occurrence of peat water drainage result in drought, which triggers land fires.

Meranti Islands Regency is the only area in Riau Province whose entire area is a peatland. From the researchers' observations, the area has not yet been optimally developed for commodities that have high economic value and can protect the peat ecosystem. For this reason, an analysis of the economic development strategy of the peatland community is needed which focuses on developing commodities in order to provide optimal production results for regional development and peatland management to maintain its sustainability. Banglas Barat Village is one of the villages in the Meranti Islands whose entire area is covered with peatlands with a depth of between 100 and 700 cm.



Source: PRIMS, BRG 2021

Figure 1 - Peat Depth Map of Banglas Barat Village, Tebing Tinggi Subdistrict, Meranti Islands Regency

One method to identify and determine community economic development strategies while still paying attention to the sustainability of the balance of the peatland ecosystem is The Quintuple Helix Innovation Model. This model describes the interaction between the five helixes/components between the government, peatland user industries, universities, the media, and the surrounding community for economic development to increase community income and the regional economy. The

figure of the interaction between these five helixes illustrates the relationship between the currently existing helixes in the Banglas Barat Village in the context of community empowerment while maintaining the preservation of peatlands.

Research Method

This study aims to determine the implementation of economic empowerment of peatland communities in Banglas Barat Village, Meranti Islands based on the

Impact Factor:

ISRA (India) = 6.317
 ISI (Dubai, UAE) = 1.582
 GIF (Australia) = 0.564
 JIF = 1.500

SIS (USA) = 0.912
 PIHII (Russia) = 3.939
 ESJI (KZ) = 9.035
 SJIF (Morocco) = 7.184

ICV (Poland) = 6.630
 PIF (India) = 1.940
 IBI (India) = 4.260
 OAJI (USA) = 0.350

innovation model of The Quintuple Helix. Therefore, this study was expected to provide input to the Regional Government of the Meranti Islands to carry

out community economic development based on local areas with peatlands that have unique characteristics that affect life and the economy as a whole.

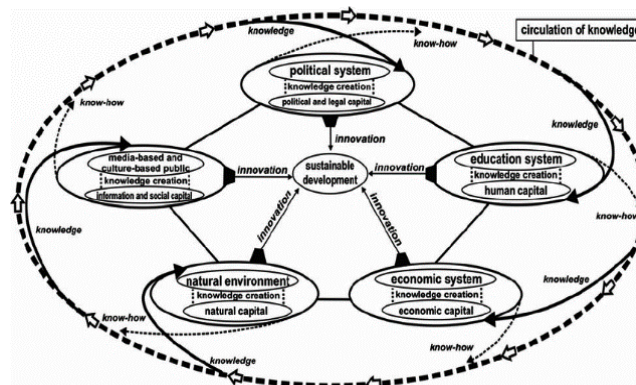


Figure 2 - The Quintuple Helix Model and Its Functions (Carayannis et al., 2012)

The types of data used in this study were primary data and secondary data that have been published by certain parties. Primary data were in the form of data on the participation and contribution of the five helixes (government, peatland user industry, universities, media, and surrounding communities) to the economic development of peatland communities. Primary data were obtained from interviews and observations with parties related to the economic development of peatland communities. The related parties were community leaders and sago processing business actors, totaling 30 (thirty) people. Secondary data used in this study was obtained from Statistics Indonesia, government agencies/institutions, and others in the form of research results, publications, and data from the government.

The obtained data were analyzed using a qualitative descriptive analysis based on The Quintuple Helix Innovation Model. This innovation model described the interaction between the five helixes/components between the government, peatland user industries, universities, media, and surrounding communities for economic development to increase community income and the regional economy. The results of this model can be described in diagrams, tables, and qualitative descriptive.

Research Results And Discussion

Research Results

Education System Helix

From the results of interviews with the village head, village officials, and community leaders/village communities, it is known that community economic empowerment has been carried out by universities/colleges by the education system. Universities/colleges have played a role in community economic development, this is recognized and supported by village officials. Village officials expect

various innovations that can be carried out by universities/colleges for the development of the village economy. Of the 12 community leaders interviewed in this study, they stated that there were universities that had come to Banglas Barat Village to provide training related to the development of sago-based SMEs, while a study on peat commonly came directly from the province or district, which did not involve the village.

Lecturers and students from the Universitas Riau (UNRI) have done various research and service in this village. Research and services that have been carried out include the development of diversification of sago products (variants, flavors, types, packaging), water purification systems, and the development of Micro, Small, and Medium Enterprises. The activities carried out aim to improve product quality and village community income. Moreover, various other universities/colleges both from Riau Province and from other provinces also came to research peat and sago, including universities from Maluku, Papua, and Sulawesi.

From the results of interviews and questionnaires, it can also be seen that the role of the university, especially the Universitas Riau, was felt by the villagers during the Student Community Service Program. Most of the respondents or 83.33 percent stated that the training they received for business development was obtained from students of the Student Community Service Program.

Economic System Helix

From the economic system, village heads, village officials, and village communities said that there were people who had received various types of capital assistance, although not all people had felt it and the number of aid funds was still limited. Providing assistance in the form of capital and equipment to businesses both working in the MSME

Impact Factor:

ISRA (India)	= 6.317	SIS (USA)	= 0.912	ICV (Poland)	= 6.630
ISI (Dubai, UAE)	= 1.582	ПИИИ (Russia)	= 3.939	PIF (India)	= 1.940
GIF (Australia)	= 0.564	ESJI (KZ)	= 9.035	IBI (India)	= 4.260
JIF	= 1.500	SJIF (Morocco)	= 7.184	OAJI (USA)	= 0.350

sector and the sago industry. From this study, it was found that there were only 3 (three) people who received assistance from special business actors processing products from sago. The amount of assistance varies, some between 25-30 million (in-kind) are received by MSMEs who process analog rice from sago, then 7-8 million (in-kind) who make sago noodles, and less than 2 million (cash) also for SMEs that process sago noodles. They said that it was rather difficult to get assistance, especially for product development, because the donors also had special requirements that MSMEs could not fulfill. Apart from this, they only received 1 (one) assistance during their business. The actors who received the assistance were all MSMEs engaged in sago processing, while the refineries and also woven thatched roofs in the Banglas Barat Village had never received any assistance, be it from the government, private sector, or from other parties such as political parties. Craftsmen or business actors of thatch roof weaving said that they needed the help of tools such as tools to take the leaves of thatch and tools to weave the roof. They said that the selling price of a thatched roof is very cheap, IDR 300,000 for 100 pieces, which means that one piece of a thatched roof is priced at IDR 3,000. They said that such income is not enough to support daily life. This is exacerbated by the fact that people have started to abandon thatched roofs as their roofs and replace them with a more durable tin roof.

Natural Environment Helix

The results of the interviews with all key informants regarding the helix of the natural environment all said that they knew that they lived on peatlands. A total of 96.67 percent stated that they know how to maintain and conserve peatlands. The way to maintain peatlands is to not burn the land and keep the land wet. The key informants also said that if they burned the peatlands they could be arrested by the police and sent to prison. The socialization of peatland protection was obtained by the village head and other village officials, and the socialization was obtained from the sub-district government and regional government. Meanwhile, from universities/colleges, they have never received anything about peatland protection.

Media-based and Culture-Based Public Helix

In the media-based and culture-based public helix, the people of Banglas Barat Village are currently still limited to accessing the internet due to limited facilities and supporting infrastructure. Community leaders who can freely access the internet are village officials, while there is a special internet network in the village office. Meanwhile, very few business actors who can access the internet, 4 (four) people) from 18 business actors engaged in sago or 22.22 percent. The rest of the business actors admit that they cannot access the internet because of limited

knowledge and no communication equipment uses the internet. Apart from the internet, business actors use telephones to contact buyers or agents who want to take their products.

Political System Helix

In general, all key informants know that there are regulations related to peatland conservation. They know that they are not allowed to burn land or damage existing plants because there will be sanctions, imprisonment. Many key informants did not know the regulations related to improving the community's economy because they only think that they have to develop the economy just to survive and fulfill all their needs.

In the political system, this village already has various village regulations which are derivatives of central, provincial, and district regulations in which there are various programs for community economic empowerment. The Banglas Barat Village apparatus prioritizes the issue of food security based on labor-intensive, indicating that the village tries to promote or explore the potential of the village which is summarized in the slogan "one village one product." The regional or village government continues to socialize to people who want to work outside that it is better to work in their area, because the potential that exists in this village is still very much, but only constrained by how to manage and develop it.

Discussion

Various studies and community services from various universities/colleges have been developed and conducted in Banglas Barat Village. Therefore, the education system helix has been implemented. However, further, development is needed regarding innovation, especially in the electricity, clean water, and community economic development sectors. The most basic challenge for the community in the village is the level of education. The average village community only graduated from elementary school, indicating that the problem lies in human resources. Low human resources might cause the absorption of information and technology to be minimal and limit the economic development considering the current rapid development of information and technology.

The roles of universities in community empowerment are:

a. Building public discourse for a democratic society, nation, and state. This is important considering that changes in conflict situations in the future will continue to color the process of change in society and these things cannot be avoided as a natural process towards democracy.

b. Developing a development model that is truly based on local resources and local knowledge.

c. Building a scientific development base that is truly relevant to the needs of society on the one hand

Impact Factor:

ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
ISI (Dubai, UAE) = 1.582	ПИИИ (Russia) = 3.939	PIF (India) = 1.940
GIF (Australia) = 0.564	ESJI (KZ) = 9.035	IBI (India) = 4.260
JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

and in response to changing global dynamics on the other.

d. Developing a community learning center. This is very important related to the preparation of human resources.

e. Assisting in the development of sound policy studies on local, national, and international level policy reform frameworks.

There have been various innovations to develop products and obtain business capital in Banglas Barat Village, although the amounts are still relatively small. There is a need for additional capital to enable the community's economic activities to run well and to improve people's living standards. Problems lie in electricity, clean water, and sanitation. Electricity in this village has not yet been fully supplied by PLN (State Electricity Company). Most of the area still uses diesel generators as a source of electrical energy. This diesel engine can only live for 6 (six) hours a day.

Innovation in the natural environment is environmentally friendly peat technology. The natural environment of Banglas West Village is in the form of peatland, which is indeed the use of which has been regulated in laws and government regulations. Therefore, it is necessary to develop innovations for economic development without destroying the peatland ecosystem.

Banglas Barat Village is not an underdeveloped village, for communication and internet access can be

enjoyed even though it is very limited. various community activities and profiles from the village can be accessed by the public outside the village. Thus, there is an overview of the users of the information and can be useful for those who are interested in developing the economy of their community.

The laws on electricity, water resources/clean water, and government regulations on peatland management have been regulated by the Government of the Republic of Indonesia. However, currently, it has not been maximally felt by the village community since it is still considered for various fundamental and technical reasons. Currently, the Banglas Barat Village Government also has various regulations and development plans which are summarized in the Village Medium Term Development Plan and Village Development Work Plan documents.

Empowerment of the people's economy is an effort to make the economy strong, large, modern, and highly competitive in the market mechanism because the constraints of people's economic development are structural constraints. Therefore, the empowerment of the people's economy must be carried out through structural changes. The structural change in question is a change from a traditional economy to a modern economy, from a weak economy to a strong economy, from a subsistence economy to a market economy, from dependence to independence.

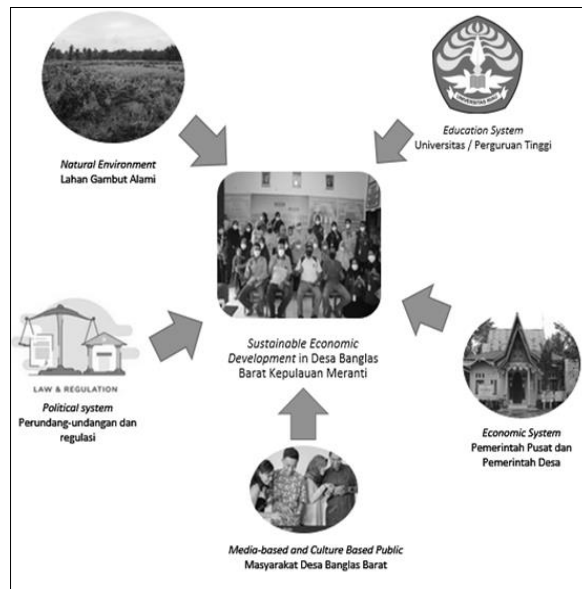


Figure 3 - The Quintuple Helix Innovation Model of Peatland Community Economic Development in Banglas Barat Village

Impact Factor:	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	PIHIQ (Russia) = 3.939	PIF (India) = 1.940
	GIF (Australia) = 0.564	ESJI (KZ) = 9.035	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

Table 1. Ideal Conditions in The Quintuple Helix Innovation Model in Peatland Community Economic Development in Banglas Barat Village, Tebing Tinggi Subdistrict, Meranti Islands Regency

No	Quintuple Helix Model	Knowledge Creation	Input	Output	Innovation	Related Parties/Components
1	Education System	Human Capital	High investment in the education system	Human resources who are skilled and understand the importance of protecting peat and empowering the community's economy	Application of sustainable knowledge about peat ecosystems, especially clean water and electricity and their use for the economy	Universities/Colleges (Universitas Riau and other universities/colleges in Riau/Indonesia)
2	Economic System	Economic Capital	Sustainable values and ideas about the synergy of peat ecosystems and community economic development	A high quality economy that can enter the market in order to create new jobs and economic growth in peatlands	Management of peatlands to meet economic needs while maintaining the peat ecosystem and meeting the needs of clean water and electricity	Central Government, Regional Government, Private Parties, Banglas Barat Village Communities
3	Natural Environment	Natural Capital	Protecting the peatland environment	Peatlands are sustainable and preserved	Peat eco-friendly technology	Natural Peatlands
4	Media-based and Culture-Based Public	Information and social capital	Lifestyle/new lifestyle	New quality of life	A new balance created between a new lifestyle and nature	Banglas Barat Village Community
5	Political system	Political and Legal Capital	Opinion, satisfaction, and citizen participation	New ideas, solutions, programs, and legislation in line with peatland sustainability	Creation of a sustainable and legal framework for peatlands accelerated electricity flow, and clean water management	Law No. 17 of 2019 on Water Resources Law No. 30 of 2019 on Electricity Government Regulation No. 57 of 2016 on Protection and Management of Peat Ecosystems

Source : Research Team, 2021

Conclusion

Based on the research that has been done, the community empowerment strategy in Banglas Barat Village based on The Quintuple Helix Innovation Method is currently unable to be implemented properly and following the theory because there are still limited main supporting facilities and infrastructure for the implementation of the innovation. Therefore, the steps that should be taken are to fulfill the main facilities and infrastructure such as electricity, clean water, telecommunication, and transportation. It is necessary to optimize research and

service activities carried out by universities in the context of empowering peatland communities, providing business capital assistance to the community to open a business or to increase their business productivity, then optimize peatland protection with the aim of not changing the peat ecosystem, where the community can still carry out economic activities on it. The point is that there is a balance that must be struck between meeting economic needs and preserving peatlands.

The development of telecommunication and internet networks is expected for the media and

Impact Factor:

ISRA (India) = 6.317
ISI (Dubai, UAE) = 1.582
GIF (Australia) = 0.564
JIF = 1.500

SIS (USA) = 0.912
PIIHQ (Russia) = 3.939
ESJI (KZ) = 9.035
SJIF (Morocco) = 7.184

ICV (Poland) = 6.630
PIF (India) = 1.940
IBI (India) = 4.260
OAJI (USA) = 0.350

culture-based public. In the political system, more binding regulations and a better focus on protecting peatlands at the village level are expected because peat villages have different characteristics both in terms of people and land.

To increase people's income and regional income, areas with peatlands are suggested to try to explore the potential for local resource-based economic development to create superior economic products that have a good marketing network.

References:

1. Alam, A.s., & Mamu, A. (2016). Isu-isu Strategis dalam Pembangunan Desa di kecamatan Pitumpanua Kabupaten Wajo, *Jurnal Ilmu Pemerintahan*, 9(114), 95-102.
2. Badan, R. G. (2017). *Lembar Pengesahan Rencana Restorasi Ekosistem Gambut 7 (Tujuh) Provinsi*. September. <https://doi.org/10.24198/jkk.v6i2.18459>
3. Bakti, I., Sumartias, S., Damayanti, T., & Nugraha, A. R. (2018). Pengembangan Model Komunikasi Pariwisata Berbasis Kearifan Lokal di Kawasan Geopark Pangandaran. *Jurnal Kajian Komunikasi*, 6(2), 217.
4. Bakti, H. S. (2018). Identifikasi Masalah dan Potendi Desa Berbasis Indek Desa Membangun (IDM) di Desa Gondowangi Kecamatan Wagir Kabupaten Malang. *Wiga : Jurnal Penelitian Ilmu Ekonomi*, 7 (1), 1 – 14. <https://doi.org/10.30741/wiga.v7il.331>
5. (2017). *CIFOR. Mengapa lahan gambut penting. Mengapa Lahan Gambut Penting*. <https://doi.org/10.17528/cifor/006476>
6. Cole, L. E. S., Bhagwat, S. A., & Willis, K. (2015). Long-term disturbance dynamics and resilience of tropical peat swamp forests. *Journal of Ecology*, 103, 16–30. <https://doi.org/10.1111/1365-2745.12329>
7. Ghazalie, G. (2020). The Analysis Quintuple Helix Minicont as a challenge for Future Logistics Defense. *Advances in Social Sciences Research Journal*, 7(2), 109–118. <https://doi.org/10.14738/assrj.72.7736>
8. Grundel, I., & Dahlström, M. (2016). A Quadruple and Quintuple Helix Approach to Regional Innovation Systems in the Transformation to a Forestry-Based Bioeconomy. *Journal of the Knowledge Economy*, 7(4), 963–983. <https://doi.org/10.1007/s13132-016-0411-7>
9. Hasan, M., & Azis, M. (2018). *Pembangunan Ekonomi & Pemberdayaan Masyarakat*. CV. Nur Lina.
10. Hutomo, M. Y. (2000). Pemberdayaan Masyarakat dalam Bidang Ekonomi: Tinjauan Teoritik dan Implementasi. *Naskah*, 20(20), 1–11.
11. Margayaningsih, D. I. (2016). Pemberdayaan Masyarakat Desa Sebagai Upaya Penanggulangan Kemiskinan. *Pemberdayaan Masyarakat Desa Sebagai Upaya Penanggulangan Kemiskinan*, 9(1), 158–190.
12. Margolang, N. (2018). Pemberdayaan Masyarakat. *Dedikasi: Journal of Community Engagment*, I(2), 87–99. <https://doi.org/10.31227/osf.io/weu8z>
13. Masganti, Wahyunto, Ai Dariah, Nurhayati, & Rachmiwati Yusuf. (2014). Characteristics and Potential Utilization of Degraded Peatlands in Riau Province. *Jurnal Sumberdaya Lahan*, 8(1), 59–66.
14. Miettinen, J., Shi, C., & Liew, S. C. (2016). Land cover distribution in the peatlands of Peninsular Malaysia, Sumatra, and Borneo in 2015 with changes since 1990. *Global Ecology and Conservation*, 6, 67–78. <https://doi.org/10.1016/j.gecco.2016.02.004>
15. Mulyani, A., Susanti, E., Dariah, A., Maswar, Wahyunto, & Agus, F. (2012). *Basisdata Karakteristik Tanah Gambut di Indonesia. Seminar Nasional Pengelolaan Lahan Gambut Berkelanjutan*.
16. Nasrul, B. (2015). Distribution and Potency of Peatlands for Agriculture in Bengkalis. *Agroteknologi*, 1, 1–7.
17. Nurida, N, L., Mulyani, A., & Agus, F. (2011). *Pengelolaan Lahan Gambut Secara Berkelanjutan*. In *Pengelolaan Lahan Gambut Berkelanjutan*.
18. Page, S. E., & Baird, A. J. (2016). Peatlands and Global Change: Response and Resilience. *Annual Review of Environment and Resources*, 41, 35–57. <https://doi.org/10.1146/annurev-environ-110615-085520>
19. Prasetyanti, R., & Kusuma, B. M. A. (2020). Quintuple Helix dan Model Desa Inovatif (Studi Kasus Inovasi Desa di Desa Panggungharjo, Yogyakarta). *Jurnal Borneo Administrator*, 16(3), 337–360. <https://doi.org/10.24258/jba.v16i3.719>
20. Rachmawati, R. R., & Tarigan, H. (2019). DI LAHAN GAMBUT Agricultural Innovation and Farmers ' Community Empowerment in

Impact Factor:

ISRA (India) = 6.317
ISI (Dubai, UAE) = 1.582
GIF (Australia) = 0.564
JIF = 1.500

SIS (USA) = 0.912
PIHII (Russia) = 3.939
ESJI (KZ) = 9.035
SJIF (Morocco) = 7.184

ICV (Poland) = 6.630
PIF (India) = 1.940
IBI (India) = 4.260
OAJI (USA) = 0.350

- Peatland Areas. *Forum Penelitian Agro Ekonomi*, 37(1), 77–94.
21. Sitorus, S. H., & Hidayat, R. (2020). Strategi Mitigasi Kebakaran Hutan Dan Lahan Melalui Pemberdayaan Masyarakat Di Sungai Pakning Kabupaten Bengkalis Provinsi Riau. *International Conference Communication and Sosial Sciences (ICCOMSOS)*, 1(1). <http://sipongi.menlhk.go.id>
 22. Stephanie, E., Yule, C. M., Padield, R., O'Reilly, P., & Varkkey, H. (2017). Keep wetland wet: the myth of sustainable development of tropical peatlands - Implication for policies and management. *Global Change Biology*, 23(2), 534–549. <https://doi.org/10.1111/gcb.13422>
 23. Sugeng, et al. (2017). *Inovasi untuk mewujudkan Desa Unggul dan Berkelanjutan* (1st Ed). Jakarta: Freidrich-Ebert-Stiftung Kantor Perwakilan Indonesia
 24. Suharyanto, & Sofianto, A (2012). Innovative Model for Integrated Rural Development in Central Java. *Bina Praja*, 4(4), 251-260. <https://doi.org/10.21787/jbp.04.2012.251-260>
 25. Sulaiman, A. A., Sulaeman, Y., & Minasny, B. (2019). A framework for the development of wetland for agricultural use in Indonesia. *Resources*, 8(34), 1–16. <https://doi.org/10.3390/resources8010034>
 26. Syahza, A., Kozan, O., Mizuno, K., & Hosobuchi, M. (2020). *Restorasi ekologi lahan gambut berbasis kelompok masyarakat melalui revegetasi di Desa Tanjung Leban*. 2, 1–9.
 27. Sumardjo, & Firmansyah, A. (2015). Inovasi Pemberdayaan Masyarakat Berbasis Sumber Daya Pangan di Sekitar Wilayah Operasional PT. Pertamina Asset 3 Subang Field (Inovation on Community Empowerment Based on Food Resources Around the Operation Area of PT . Pertamina Asset 3 Subang Field). *Agrokreatif*, 1(1), 8–19. <http://care.ipb.ac.id/jurnal-1/>
 28. Sumarto, R. H., Sumartono, Muluk, K. R. K., & Nuh, M. (2020). Penta-Helix and Quintuple-Helix in the management of tourism villages in Yogyakarta City. *Australasian Accounting, Business and Finance Journal*, 14(1 Special Issue), 46–57. <https://doi.org/10.14453/aabfj.v14i1.5>
 29. Turetsky, M. R., Benscoter, B., Page, S., Rein, G., van der Werf, G. R., & Watts, A. (2015). Global vulnerability of peatlands to fire and carbon loss. *Nature Geoscience*, 8, 11–14. <https://doi.org/10.1038/ngeo2325>
 30. Wahyunto, Ritung, S., & Subagjo, H. (2003). *Peta Luas Sebaran Lahan Gambut dan Kandungan Karbon di Pulau Sumatera / Map of Area of Peatland Distribution and Carbon Content in Sumatera, 1990-2002*. Wetlands International – Indonesia Programme & Wildlife Habitat Canada (WHC), 9.
 31. Yuliani, Febri, & Rahman, A. (2018). Metode Restorasi Gambut Dalam Konteks Mitigasi Bencana Kebakaran Hutan Lahan Gambut dan Pemberdayaan Masyarakat. *Sosio Informa*, 4(02), 448–460.
 32. Yusuf, R. (2014). Karakteristik Dan Potensi Pemanfaatan Lahan Gambut Terdegradasi Di Provinsi Riau. *Jurnal Sumberdaya Lahan*, 8(1), 59–66. <https://doi.org/10.2018/jsdl.v8i1.6444>
 33. Zulkarnaini, Z., & Lubis, E. E. (2019). Pemberdayaan Masyarakat Dalam Pemanfaatan Ekosistem Rawa Gambut Secara Berkelanjutan. *Jurnal Kebijakan Publik*, 9(2), 89. <https://doi.org/10.31258/jkp.9.2.p.89-96>