

Utilization of Peatland Technology for Food Availability in a Legal Perspective

Jeane Neltje Saly

Faculty of Law Tarumanagara University
Letjen S. Parman Street Number 1, West
Jakarta, Indonesia
jeanes@fh.untar.ac.id

Christine S.T. Kansil

Faculty of Law Tarumanagara University
Letjen S. Parman Street Number 1, West
Jakarta, Indonesia
christinek_51170@yahoo.co.id

Adriel Michael Tirayo

Faculty of Law Tarumanagara University
Letjen S. Parman Street Number 1, West
Jakarta, Indonesia
adrielmtirayo@gmail.com

Abstract—The results of this research revealed that problematics with the use of peat technology due to the rate of conversion of agricultural land, expansion of agricultural land, and increasing production of food crops is not optimal, despite long-term solutions to the crisis of fire and haze, therefore it is important to implement Government Regulation of 2016 about the Protection and Management of Peat Ecosystems to meet the basic needs of the community from local resources. The problem is what is the government’s effort to improve the realization of food sufficiency through the use of peatlands and what is the legal basis above that. The research methods use a normative juridical method, by used secondary data obtained through study literature and analysed qualitatively. The results and discussion of this research is that the government’s efforts in applying standard technology efficiently produces useful results with the use of peat as a solution of food security through a touch of technology. The legal basis is the Presidential Regulation of 2016 about Peat Restoration Agency, which functions to accelerate the restoration of the area and restore the hydrological functions of peat due to forest and land fires in a special, systematic, directed, integrated and comprehensive manner.

Keywords: *food availability, peatlands, technology*

I. INTRODUCTION

The results of this research revealed that problematics with the use of peat technology due to the rate of conversion of agricultural land, expansion of agricultural land, and increasing production of food crops is not optimal, despite long-term solutions to the crisis of fire and haze, therefore it is important to implement Government Regulation of 2016 about the Protection and Management of Peat Ecosystems to meet the basic needs of the community from local resources.

Law No. 18 of 2012 about Food [1], functions as a guideline for the implementation of an orderly food, on the consideration that the most basic human needs and fulfillment are part of human rights guaranteed in the Constitution of the Republic of Indonesia in 1945. Therefore, the State is obliged to realize the availability, affordability, and fulfillment of adequate, safe, quality, and nutritious food consumption that is balanced, both at the national and regional levels to individuals evenly throughout the territory of the Unitary Republic of Indonesia. This is done not only temporarily but all the time by utilizing local resources, institutions and culture. As a country with a large population and on the other hand having diverse natural resources and food resources, Indonesia is able to fulfill its food needs sovereignly and independently.

According to the Food Law, the purpose of implementing food fulfillment is based on local resources in order to achieve increased capacity to produce food independently, diverse and meet the requirements of security, quality, and nutrition for public consumption, as well as increase added value and competitiveness of food commodities in the domestic market and abroad. No less important is the improvement of welfare for farmers, fishermen, fish cultivators, and food entrepreneurs and protect and develop the wealth of national food resources. However, agricultural land in some areas cannot be used directly due to drought, rocky soil, and peat unless it is processed technically as is done in the Kalimantan region.

Peatland is a specific ecosystem that is always flooded (waterlogged) has multi functions including economic functions, regulating hydrology, environment, culture, and biodiversity. Peatlands are generally arranged by remnants of vegetation that accumulate for a long time and forming peat soil. Peat soil is fragile, relatively infertile and irreversible. The potential and suitability of peatland for agriculture is very limited by the main factors, namely drainage. Plant carrying capacity, maturity and

thickness of peat soils and chemical properties which are generally classified as low to very low [2].

The demand for food for the increasing population has forced the government to expand the area of agricultural cultivation. Peatland which is marginal land is also a target for conducting food crop cultivation. However, due to the chemical properties of peat soils which have many limitations for conducting food crop cultivation, amelioration must be done to improve soil properties [3].

Other issues that are still lagging behind and need attention are efforts to increase agricultural productivity of poor farmers, fisheries business and cultivation and other microscale businesses that support the small business production chain that is potential in the region. Attention also needs to be paid to increasing access to land and productive assets that often limit the increase in production and business scale of the poor. The availability of economic facilities and infrastructure in rural areas, access to credit for financial services and other capital sources for rural economic actors and the use of agricultural research and technology, dissemination and provision of information on agricultural technology are also important factors in driving rural economics [4].

Peatland is an ecological unit that should be managed based on the boundaries of its ecosystem, even though the ecosystem boundary crosses administrative boundaries or authority of certain agencies. Management practices by referring to ecosystem boundaries become more difficult if there are no institutions that coordinate and take full responsibility. In this connection, it is recognized that up to now there has not been an institution either at the central or regional level that has full responsibility and authority in implementing or coordinating peatland management activities.

Considering a and b Government Regulation No.

57 of 2016 about Amendments to Government Regulation No. 71 of 2014 about Protection and Management of Peat Ecosystems described that "peat is a vulnerable ecosystem and has suffered damage due to forest and land fires in 2015, so intensive efforts must be made in protection and management". Government Regulation Number 71 of 2014 concerning Protection and Management of Peat Ecosystems needs to be refined in accordance with developments and legal needs in the community.

The central government and regional government are urgently needed to streamline community participation such as counseling to forest area users, including the education environment. The foundation of legal norms is intensive efforts in protection and management, in addition to providing infrastructure to prevent peat ecosystem damage, it is also

necessary to prepare technical regulations as the basis for implementing its programs, developing early detection systems, strengthening government institutions and resilient communities, as well as increasing legal awareness society. This was stated in Article 22 Paragraph (2) Government's Regulation No. 71 of 2014, that: "Prevention of damage to the Peat Ecosystem as referred to in article 22 paragraph (2) letters a is carried out by:

- a. Reparation of technical regulations;
- b. Development of early detection systems;
- c. Strengthening government institutions and resilient communities;
- d. Increasing community legal awareness; and/or
- e. Safeguarding areas prone to fire and fire scars."

In the context of developing early detection, the seriousness of the relevant parties, such as stakeholders, is needed to avoid damage to peat from fires. This is determined in the Activities Plan of the National Peatland Management Working Group, "National Strategy and Action Plan: Sustainable Management of Peatlands". The achievement of food security, which is a basic need of the people of Indonesia guaranteed in the 1945 Constitution, is hampered by geography, weather, rainfall, and most of the land that cannot be planted, such as peatlands. At present, there is a polemic related to the rampant peat issue that needs to be resolved globally, especially ASEAN, and nationally. Eniya Listyani Dewi, Deputy of Agroindustry and Biotechnology Technology (TAB-BPPT) said that forest, land fires (karhutla) and land conversion require solutions globally.

In this connection, Indonesia has a dilemma. While striving to undergo development, the State is obliged to realize the availability, affordability, and fulfillment of food consumption with a large population, despite being rich in diverse natural resources and food sources. Law No. 18 of 2012 concerning Food [1] aims to ensure legal certainty in the realization of Indonesia's food consumption in a sovereign and independent manner through local culture.

However, the reality is that the desire to use local resources, institutions, and culture has not been able to be optimally achieved, both in an adequate, safe, quality and balanced manner, evenly throughout Indonesia. In this paper we will discuss how the government is striving to achieve Food Safety Perspectives No. 18 of 2012 on food [1] as a target for addressing food safety issues in peat technology applications.

II. RESEARCH METHODS

This paper uses a normative juridical method, which is to normatively examine the functions of Law Number 18 of 2012 concerning Food [1] in the application of peat technology as a solution to food security. The data used in this study are

secondary data obtained through data collection techniques, namely studies literature. The data obtained was analyzed qualitatively.

III. RESULTS AND DISCUSSION

A. *Politics of the Law of Food Sovereignty*

The politics of food law intended in this research is a policy that the government wants related to food about how rights and obligations as well as the mechanism of its implementation, which is in the form of legislation. The politics of food sovereignty is an illustration of the State's commitment as outlined in the Constitution of the Republic of Indonesia in 1945 [5], in the Preamble, as follows [6]

“Then than that to form an Indonesian state government that protects the entire Indonesian nation and all of Indonesia's bloodshed and to promote public welfare, educate the nation's life, and participate in carrying out world order, ... and so on”.

The State's obligation to prosper the people as explained in the Food Law consideration is to realize the availability, affordability and fulfillment of adequate, safe, quality, and nutritious food consumption balanced at both national and regional levels to individuals evenly throughout the Republic of Indonesia throughout the time by utilizing local resources, institutions, and culture. Because Food is the most basic human need and its fulfillment is part of human rights guaranteed in the 1945 Constitution of the Republic of Indonesia as a basic component for realizing quality human resources; As a country with a large population and on the other hand having diverse natural resources and food resources, Indonesia is able to fulfill its food needs sovereignly and independently.

The State's obligation to prosper the people is supported by the provisions in Article 33 paragraph (3), namely that "the earth, water and natural resources contained therein are controlled by the State and are used for the greatest prosperity of the people".

The provisions of Article 33 paragraph of the 1945 Constitution, constitute the reason for the responsibility of the State to create people's welfare through the provision of quality food. The State's obligations include the obligation to ensure the availability, affordability, and fulfillment of adequate, safe, quality, and nutritious food consumption in a balanced manner effectively. Fulfillment of food availability can result in stable social and economic conditions, as well as the politics of the country as happened in China, Germany, Australia, and New Zealand which are countries that are able to turn into developed countries due to the progress of their

agricultural sector.

In relation to government responsibility, the desire for food availability if there is conformity in the material content of the laws and regulations related to increasing food sovereignty, legislation related to the increase of potentially harmonious food sovereignty, and not overlapping, do not experience obstacles related to the increase food sovereignty in the field, and the legislation applies effectively in practice.

B. *Compatibility of Law Politics in Law No. 18 of 2012 about Food and Government Regulation of 2016 about Protection and Management of Peat Ecosystems*

Food Law consists of 154 articles and applies in full. If studied related to norm writing techniques, then the mention of the principle in Article 2 is not needed, in the body of the law because it will not be operational (does not have a norm operator). Principles are values that inspire the whole norm that contains the arrangement. Furthermore Article 3, a description related to the purpose of the implementation of food, which should be contained in the general explanation of the Act and in its academic texts. If the provisions regarding this objective are required in a statutory regulation (PUU), it should be formulated in one of the points 1 on general provisions.

Norms should be stated that principles are revoked, enough basic elaboration is in academic texts. If indeed there is principle that is important for normalization, it is necessary to have standard and operational norms and be included in the general provisions.

The results of this research on the norms contained in the 2016 Presidential Regulation, concerning the Peat Restoration Agency contain the coordination and implementation mechanism for peat protection and cultivation, as well as efforts to overcome forest fires. The Presidential Regulation is the implementation of the Strategic Plan for the Peat Restoration Agency (BRG Renstra) [7] for 2016-2020 as the mandate of Law No. 25 of 2004 concerning the National Development Planning System.

The BRG Renstra [7] for 2016-2020 is intended as a guideline and reference in implementing strategic steps to achieve the target of Peat Restoration Coordination and Facilitation Program in 7 Provinces so that the restoration of 2 (two) million hectares of peat ecosystem can run in the right direction, reach the goal and its targets effectively and efficiently, as well as achieving multi-benefit peat ecosystems for economic, social and ecological interests.

To achieve this goal, the 2016-2020 BRG Strategic Plan outlines the strategies for achieving the targets and performance targets of the Peat Restoration Coordination and Facilitation Program in 7 Provinces.

Strategies include types of activities, activity targets, activity

performance indicators, activity performance targets, indicative location of performance targets, and an overview of the process or stages of restoration, input components in efforts to achieve output. The BRG Renstra [7] was carried out in view of input from various groups concerned with sustainable protection, restoration and management of peat, as well as various updates on data obtained during the BRG within 10 months.

Effective legislation, if it functions as a means of implementing development. This is in accordance with what was stated by Mochtar Kusumaatmadja [8] that in the Legal Function in national development, development works in an orderly manner if the law functions effectively. In particular, the results of the research focused on this article are legal politics. The legislation related to the use of peat technology for food availability is the Food Law, and the 2016 Presidential Regulation, concerning the Peat Restoration Agency.

The politics of the Law on Food Sovereignty contained in the Considerations and torso of the Food Law is:

- a. The obligation of the state to realize the availability, affordability and fulfillment of adequate, safe, quality, and nutritious food consumption in a balanced manner, both at the national and regional levels to individuals;
- b. Prioritizing domestic production by optimally utilizing local resources, institutions and wisdom;
- c. Rights of the state and nation that independently determine Food policy without being dictated by any party;
- d. Ensure the right to food for the people;
- e. Provide the right for the community to determine the Food system that is in accordance with the potential of local resources;
- f. Providing benefits in a fair, equitable and sustainable manner based on Food Sovereignty, Food Independence and Food Security;
- g. Provide protection, both for those who produce and those who consume food;
- h. Food business actors have the freedom to set and carry out their business in accordance with their resources. Judging from the legal political suitability to meet food availability, it is a government responsibility implemented in the legal politics contained in the Food Law in accordance with the legal politics in the 2016 Presidential Regulation, regarding the Peat Restoration Agency. The suitability of responsibilities, namely in the Food Law, the government's responsibility to provide quality food, has problems, including poor land in the Kalimantan region, sought by peat technology for food supply.

C. Peat Technology in Food Supply

Management of Sustainable Peatlands carried out by the National Peatland Management Working Group, this is done [9] because the mechanism for implementing cross- sectoral coordination has not been adequately available. The absence of specialized institutions and the lack of communication and coordination between agencies (cross- sectoral) in the Regional Government or between the Regional Government and the Central Government have caused peatland management activities to be prone to conflict. Even in some places, these weaknesses have threatened the preservation of natural resources. Peatland management requires policies that bind all stakeholders and all implementers of the activity. Peatland management requires strong institutions, including aspects of regional control and accountability, organizational aspects, institutional capacity aspects, and financing aspects.

Another important issue is the low level of community participation in the preparation of peatland management policies. This problem causes the implementation of various policies that are still conflicting, prone to conflict and difficult to implement. This problem becomes increasingly complicated with the presence of institutional weaknesses, weaknesses in the contents of the regulations / laws and policies themselves which trigger the difficulty of implementing (enforcing) these laws and policies in peatland management. Another thing that also greatly influences the effectiveness of law and policy enforcement is generally determined by the ability to understand and awareness of the broader community law including compliance with laws and policies themselves.

The low level of community participation in drafting a peatland management plan also makes activities that will be implemented or programmed to be unilateral and less sensitive to local culture. Often plans and implementation of peatland management activities are not adapted to local conditions. The appreciation and use of traditional wisdom that should be the basis for managing peatlands at the local level is relatively low or even neglected.

The problem of peatland use for agriculture is still a polemic. Utilization of peatland for agriculture in practice has not been optimally achieved, giving rise to the pros and cons of various parties, even though the utilization that has been done has not yet given maximum results. The term utilization is also still no agreement on its use. Therefore, according to Suwido H. Limin, a fundamental agreement on understanding the word "utilization" must be sought [10].

Utilization of peat for agriculture including plantations and industrial crops is classified as very vulnerable, especially if carried out on thick peat in the interior (called inland peat). As a result, inland peatlands are used for the development of the above commodities, it requires efforts to adjust the conditions of the land water or drain the land by making drainage canals or canals

[11]. While for the type of coastal peat in the tidal area, the making of drainage or canal is intended to channel water to the inside (several kilometers from the banks of the river or sea). Without making drainage channels or canals on inland peat, it is certain that only native species can grow in water saturated conditions or wet dominant areas. Behind the making of drainage which causes a decrease in groundwater, changes in temperature and humidity occur in the peat layer near the surface, thus accelerating the weathering process and the surface of the peat decreases.

According to Jacques Ellul, Technology is a series of methods or methods that have been standardized to achieve results that have been previously calculated [12].

Based on the above understanding, a series of methods or methods of applying standardized technology to achieve efficient results is the basis for efforts to use peat as a solution to achieve food security through contact of technology. In the rational use of agriculture in peatlands environmental factors, production efficiency, and sustainability of land resource use must be considered [13]. This is due to peatland which is not easy to produce and easily burns. This is because peat is not easy to produce and is easy to burn. In addition to careful planning, management also needs long-term use of technology to meet optimal and sustainable productivity to meet the growing needs of the population.

Eniya said, that the characteristics of peat are difficult to develop into agriculture, and even no productivity. On the other hand, as the world's population increases, so does the demand for world food. Therefore, using it requires some technology. In addition, those who develop agriculture on peatlands must understand the problem of water storage function, because if it is dry, it will become flammable. The widely available peatlands can be used to meet the growing food needs of the community, which will fill the area and lead to increased food demand.

According to the Agricultural Land Research and Development Center (BBSDL) [14], "the availability of land minerals is increasingly limited, and on the other hand the population grows by 1.49% per year, especially in relation to food security".

The availability of peatlands in Indonesia has agricultural potential because of the hierarchical shrubs in the forest. Some people think that peat is the term Banja Malay tribe in Serrata Kalimantan against a pile of organic matter, which is naturally formed by plant remnants that are not completely decomposed and accumulated in the marshes. The vertical thickness of peatlands can reach tens of meters or even tens of meters and can adapt to thousands of years or even tens of

thousands of years, thus creating an interdependent relationship between organisms and non-biological groups that support symbiosis.

"The availability of peatlands in Indonesia has agricultural potential because of the hierarchical shrubs in the forest. "In Indonesia, the available peatlands that have been degraded are quite extensive; some enter the convertible production forest area (HPK) and the forest area (APL) allocated for other uses and can be planted by applying appropriate techniques. In the 14.03 million hectares of peatlands Among them, 29.5% are degraded forests, shrubs with agricultural potential; 55.4% are forests that must be preserved as protected areas; 15.1% are grown as agricultural land (food crops, plantations and industrial plants) [14] and SAT Peatlands. IS Factory results, although not a few shows still need improved management".

In order to make the implementation of the law in an orderly manner, the law is used as the basis for implementation. This is in line with Kusumaatmadja Mochtar's view that law as a means of implementing development allows it to operate in an orderly manner. In this regard, the President established the [15] on the development of agricultural peatlands for food crops in the Central Kalimantan Province, as the implementation of Law No. 12 of 1992 on the cultivation of food crops. The basis of consideration for the establishment of the Presidential Decree is:

"The agricultural sector has a very important role in national development, especially in an effort to continue to strengthen food self-sufficiency. In terms of equalizing the implementation of development activities and results, as well as enhancing environmentally sound regional development programs, it is deemed necessary to take steps to develop and utilize peatlands in Central Kalimantan to increase production and strengthen food self-sufficiency" [8].

However, implementation is not sustainable for several reasons. In addition, the analysis of environmental impact errors and the lack of mastery of the underlying data used as design materials has led to various assumptions that have led to errors in their implementation. This situation is consistent with the acceleration of the Eastern Region Development Minister Rossid M's expert staff in Palangara, who believes that one of the reasons for the failure is a lack of understanding of the social and cultural conditions of the local community and uncoordinated environmental conditions. Separating the peat dome center for irrigation during the project implementation phase actually leads to drought. Because the peat dome is lost or reduced as a function of water storage. "A million hectares of land will only damage the environment," he said.

As seen in the picture below. The main (primary) canal of

the former PLG stretches from the south to the north along hundreds of kilometers, parallel to the Sebangau river. This channel divides the peat dome which stretches 128 km at the end of the Java sea in the South, to the village of Pilang in the border area of the city of Palakaraya in the north. This channel divides the existing peat dome (peat dome).



Figure 1: Peatland

In the development era of the reform era, the government pays attention to peatland for agriculture in the abandoned areas of Kalimantan, where one of them is the former management of the new order era which was not planned sustainably so that it failed as seen in the picture above.

“The area was once included in the one million hectare Peatland Development Project (PLG) that was carried out during the Soeharto era. From an early age, the problem of destruction of peatlands was inseparable from the ambitious mega project of printing rice fields. In order to succeed the project, at that time the canals were built to divide the peat dome. The canals that are made then trigger damage, the water content in the period is rapidly shrinking. Peat becomes dry during the dry season and becomes a fire violation. With this condition, it is not surprising that then Pulang Pisau Regency became one of the worst-hit districts last year in Central Kalimantan. Even though this district has an area of only 5.85 percent (8,997 km² of the Central Kalimantan area of 153,564 km²)” (Rosyid, 2003).

As the implementation of government responsibilities, various efforts have been carried out. The government's actions are appropriate, because the State can be said to fail if it cannot meet the basic needs of the people, which in this regard is the need for food. This is according to what Socrates stated, that the task of the State is to advance the happiness of its citizens and make their souls as good as possible. A ruler must have an understanding of "the good" [16].

Establishment of Peat Restoration Agency (Brg), based on the Republic of Indonesia Presidential Regulation Number

1 Year 2016 concerning Peat Restoration Agency (Perpres No.1 / 2019 concerning Peat Restoration Agency (Brg) [7].

"In the context of accelerating the recovery of the area and restoring the hydrological functions of peat due to forest and land fires in a specific, systematic, directed, integrated and comprehensive manner, it is deemed necessary to establish a Agency that will carry out Peat Restoration activities" [17]

Peat experts, among others Prof. Azwar M'aas, Gadjah Mada University, are of the view that the use of peat should include the law of water flowing from top to bottom, because if the peat dome is cut, the water will release. The principle of managing peat is a hydrological unit with management must be synchronous because if it is different and there is no dependence on the ecosystem it will be a source of disaster, Plants adjust the peat ecosystem, not vice versa, and not peat ecosystems that must adapt to plants.

The use of peat which is not in accordance with its principles can be seen in the following figures:



Figure 2: in the form of canals

These canals intersect peat. Water comes out and releases to encourage dry peat and trigger a fire.



Figure 3: Management of Peat

In a state of balance, the speed of accumulation of organic matter (biomass) will be proportional to the loss of organic C; so that the accumulation of peat material will be constant at a certain height according to the amount of water rented to affect the anaerobic and aerobic conditions of the precipitated peat material.

In equilibrium, the condition of the oxidation / decomposition of peat material, then the surface height of the land will be constant. As a result, precipitated peat material (which is always between two rivers) can form what is

called a "peat dome" or peat dome, as shown in Figure 4.



Figure 4: Peat material deposited between two rivers, which can be used as food fields on the left and right.

The efforts made by the President are one of the implementation of the country's wishes in realizing the achievement of food security which is the basic need of the Indonesian people guaranteed in the 1945 Constitution, related to food security as stipulated in Law Number 18 of 2012 [1], the goal is to optimize local food through the development of technology and incentive systems for local food processing businesses and optimizing land use in the context of food availability [18].

IV. CONCLUSION

Government efforts in realizing the achievement of food security which are the basic needs of the Indonesian people are through the opening of 29.5% peat land in the form of degraded forests overgrown with shrubs which have the potential for agriculture. Continuing 15.1% of the area in the form of peatland which has been cultivated as agricultural land (food crops, plantations and industrial plants) with satisfactory results, although not a few indicate that there is still a need for improved management. In order to run in an orderly manner, the implementation is based on law, including the Republic of Indonesia Presidential Regulation No. 1 of 2016, the Peat Restoration [19] Agency with the aim of accelerating the restoration of the area and returning hydrological functions of peat due to special, systematic, directed and integrated forest and land fires. The agency that will carry out Peat Restoration activities. This Presidential Regulation is the implementation of Law No. 18 of 2012 concerning Food [1] in the application of peat technology as a food security solution.

REFERENCES

- [1] Constitution of the Republic of Indonesia in 1945. Law No. 18 of 2012 about Food.
 [2] Agus, Fahmuddin, dkk. 2016. *Lahan Gambut Indonesia: Pembentukan,*

- Karakteristik dan Potensi Mendukung Ketahanan Pangan.* Jakarta: Badan Litbang Pertanian.
 [3] Widyati, Enny. "Kajian Optimasi Pengelolaan Lahan Gambut dan Isu Perubahan Iklim", *Jurnal Tekno Hutan Tanaman*, Vol.4:2. Agustus 2011.
 [4] Badan Perencanaan Pembangunan Nasional. 2014. *Rencana Pembangunan Nasional 2015-2019, Buku 1: Agenda Pembangunan Nasional.* Jakarta: Bappenas.
 [5] Manan, Bagir. 2009. *Politik Penyusunan Peraturan Perundang-undangan.* Jakarta: Hin & Hill.
 [6] Badan Pembinaan Hukum Nasional. 2016. *Pusat Analisis dan Evaluasi Hukum Nasional Badan Pembinaan Hukum Nasional Kementerian Hukum dan HAM RI Tahun 2016.* Jakarta.
 [7] Badan Restorasi Gambut RI. 2016. "Rencana Startegis Badan Restorasi Gambut 2016-2020". [https://brg.go.id/files/RENSTRA%20BRG%202016-2020%20\(November%202016\).pdf](https://brg.go.id/files/RENSTRA%20BRG%202016-2020%20(November%202016).pdf). Jakarta, 30 November 2016.
 [8] Kusumaatmadja, Mochtar. 1998. *Fungsi Hukum Dalam Pembangunan Nasional.* Bandung: Binacipta.
 [9] Saly, Jeane Neltje. 2014. *Permasalahan Gambut Perlindungan Gambut dan Upaya Pemerintah, Kerjasama Alumni Pascasarjana Bidang Hukum, Universitas Pembangunan Veteran.* Jakarta: Hin&Hill.
 [10] Limin, Suwido H. "Pemanfaatan Lahan Gambut untuk Pertanian, Kerjasama antara Badan Pengkajian dan Penerapan Teknologi (BPPT) dengan Kementerian Koordinator Kesejahteraan Rakyat". <http://webdocs.alterra.wur.nl/internet/peatwise/docs/phase3/Reports/Pemanfaatan%20lahan%20gambut%20dan%20permasalahannya.pdf>. Jakarta, 22 November 2006.
 [11] Robinson. 2007. *Manfaat Gambut Bagi Pertanian.* Jakarta: Radja Grafindo.
 [12] Ellul, Jacques. 1954. *Philosophy, Sociology, Philosophy of Technology,* Vintage Books.
 [13] Masganti. "Teknologi Inovatif Pengelolaan Lahan Sub Optimal Gambut dan Sulfat Masam Untuk Peningkatan Produksi Tanaman Pangan", *Jurnal Pengembangan Inovasi Tanaman*, Vol 6:4. 2013.
 [14] Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan BSSDLP. <http://www.litbang.pertanian.go.id>. Jakarta, 30 November 2018.
 [15] Presidential Decree No. 82 of 1995 about Peatland Development of Food Crop Agriculture in Central Kalimantan.
 [16] M, Rosyid. "Proyek Lahan Gambut (PLG) Sejuta Hektar yang dilaksanakan di Provinsi Kalimantan Tengah (Kalteng) Di Era Mantan Presiden Suharto, Dinilai Gagal". <https://nasional.tempo.co/read/20664/proyek-lahan-gambut-sejuta-hektar-gagal>. Jakarta, 8 Oktober 2003.
 [17] Nugraha, Indra. "Lahan Gambut Eks PLG Satu Juta Hektar, Bagaimana Kabarnya Saat ini?". <https://www.mongabay.co.id/2016/06/10/lahan-gambut-eks-plg-satu-juta-hektar-bagaimana-kabarnya-saat-ini/>. Palangkaraya, 10 Juni 2016.
 [18] Socrates dalam Plato, *The Republic*, Cambridge University Published, Terjemahan, Pustaka Narasi, No. ISBN, 9789791684125.
 [19] Presidential Regulation No. 1 of 2016 about The Organization of Peat's Restoration.
 [20]. ASEAN-China Workshop on Sustainable Utilization of Agricultural Peatland di Jakarta, Senin (31/7), <https://www.bppt.go.id/teknologi-agroindustri-dan-bioteknologi/2941-kelola-lahan-gambut-untuk-pangan> Category: Berita Teknologi Agroindustri & Bioteknologi Published: Tuesday, 01 August 201708:46, Diakses di Jakarta, 30 Oktober 2018.
 [21]. Kelompok Kerja Pengelolaan Lahan Gambut Nasional. "Strategi dan Rencana Tindak Nasional: Pengelolaan Lahan Gambut Berkelanjutan". <http://wetlands.or.id/PDF/buku/Pengelolaan%20gambut%20berkelanjutan.pdf>. October 2006.

- [22]. S, Sabiham. "Pengembangan dan Pemanfaatan Lahan Gambut". <http://www.cifor.org/ipn-toolbox/wp-content/uploads/pdf/A2.pdf>.
- [23]. Workshop on available sustainable. ASEAN Crops website launched at the Meeting of the ASEAN. <https://www.asean-agrifood.org/asean-crops-website-launched-at-the-meeting-of-the-asean-ministers-on-agriculture-and-forestry/Oct%2017>.