

# Food estate: Village regulations to support and protect sustainable agricultural land

Wartiningsih<sup>1\*</sup>, Nunuk Nuswardani<sup>1</sup>, Amelia Ayu P<sup>2</sup>, Devi Rahayu<sup>1</sup>, Riesta Yogahastama<sup>1</sup>, Erma Rusdiana<sup>1</sup>, Moza Fausta<sup>3</sup>

<sup>1</sup> Faculty of Law, Trunojoyo University of Madura

<sup>2</sup> Faculty of Law, Brawijaya University

<sup>3</sup> Faculty of Law, Dr. Soetomo University

**Abstract.** Countries around the world expect stable and sustainable forest management. Climate change is one of the issues related to global development and the environment. Furthermore, the sustainable development paradigm emerged by introducing a development orientation emphasizing the importance of economic growth, social development and protection of ecosystem carrying capacity. Indonesia ratified the Paris Agreement on October 31, 2016, through Law Number 16 of 2016. Based on the Nationally Determined Contributions (NDCs), Indonesia must prevent climate change. The NDC reflects the current conditions in data and information and the analysis and future scenarios carried out by Indonesia. Indonesia must make more efforts to maintain forest sustainability to avoid deforestation. The Regulation of the Minister of Environment and Forestry (Permen LHK) Number 24 of 2020 concerning the Determination of Forest Areas for the Development of Food Estates has emerged. It is controversial because the Regulation stipulates that food estates can be built in forest areas with 2 (two) mechanisms, namely through changes in the designation of forest areas and the determination of Forest Areas for Food Security. This article uses a legislative approach, analyzing prescriptively and concluding using inductive logic. The study found that the current Ministerial Regulation, which allows the construction of food barns in forest areas, has been criticized for its potential to cause deforestation and environmental degradation. The proposed model village regulation addresses these issues by aligning food barn construction with local community needs and environmental protection.

## 1 Introduction

Forests have a critical position and role in supporting development. Because forests provide benefits for the prosperity and welfare of the people. Realizing the seriousness, urgency, and uniqueness of development and environmental problems, countries worldwide hope for the stable, sustainable management of all forests [1]. One of the issues related to development and the environment is climate change. An international agreement on global warming began to be negotiated in Kyoto in December 1977. In line with this hope, a sustainable development paradigm emerged by introducing a development orientation that emphasizes the importance of 3 (three) pillars that underlie decision-making, namely: (1) economic growth, (2) social development and (3) protection of ecosystem carrying capacity [2].

Furthermore, the 2005 Kyoto Protocol led to a global agreement to reduce greenhouse gas (GHG) emissions. However, the obligation to reduce GHGs only applies to developed countries and ignores the fact that developing countries can also be major contributors to world GHGs. In the 2015 Paris Agreement, which was participated in by 196 countries, including Indonesia, it was agreed to

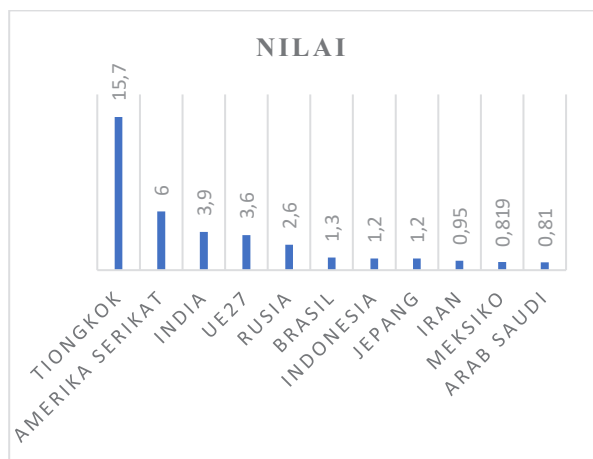
reduce national greenhouse gas emissions and help developing countries fight the worst impacts of the currently ongoing climate crisis [3]. The Kyoto Protocol (2005) and the Paris Agreement (2015) are global efforts to combat climate change involving 196 countries, including Indonesia. These agreements aim to reduce greenhouse gas (GHG) emissions and support developing countries in addressing climate impacts.

Indonesia's commitment by ratifying the Paris Agreement on October 31, 2016, through Law Number 16 of 2016. For state parties such as Indonesia, there is an obligation to take steps to prevent climate change as outlined in the Nationally Determined Contributions (NDCs). NDCs reflect the latest conditions in terms of data and information, analysis, and future scenarios by the Indonesian Government for emission reduction. Undeniably, Indonesia, as a developing country, will experience dynamic changes due to changes in the economy at the national and global levels. Therefore, as a consequence, the NDC document will be reviewed and adjusted, as needed, by considering national conditions, capacity and capabilities, and the provisions in the Paris Agreement.

According to the 2010 Second National Communication document, Indonesia's greenhouse gas

\* Corresponding author: [wartiningsih@trunojoyo.ac.id](mailto:wartiningsih@trunojoyo.ac.id)

(GHG) emissions were estimated at 1.8 GtCO<sub>2</sub>e in 2005. This figure shows an increase of 0.4 GtCO<sub>2</sub>e compared to 2000. The largest source of emissions (63%) comes from land use change activities and forest and land fires, while fuel oil consumption contributes to GHG emissions of 19% of total emissions [4]. During the COVID-19 pandemic period, which triggered the PSBB policy, they succeeded in reducing GHG emissions. The forestry sector supported a reduction in GHG emissions of 17.2%. To control global climate change, Indonesia aims to reduce GHG emissions by 29% with its efforts and 41% with international support by 2030 [5]. With the simple idea of achieving a reduction or reducing GHG emissions, Indonesia should increasingly make efforts to preserve forests to avoid deforestation. In reality, the Regulation of the Minister of Environment and Forestry (Permen LHK) Number 24 of 2020 concerning the Provision of Forest Areas for Food Estate Development has emerged, which has attracted a lot of controversy. Through the Ministerial Regulation, changes are made to the designation of forest areas to determine Forest Areas for Food Security (KHKP); in this case, it will undoubtedly reduce the area of forest cover in Indonesia. Indonesia contributed 1.24 billion Gt CO<sub>2</sub>e in 2022, making it the 7th largest greenhouse gas emitter in the world [6].

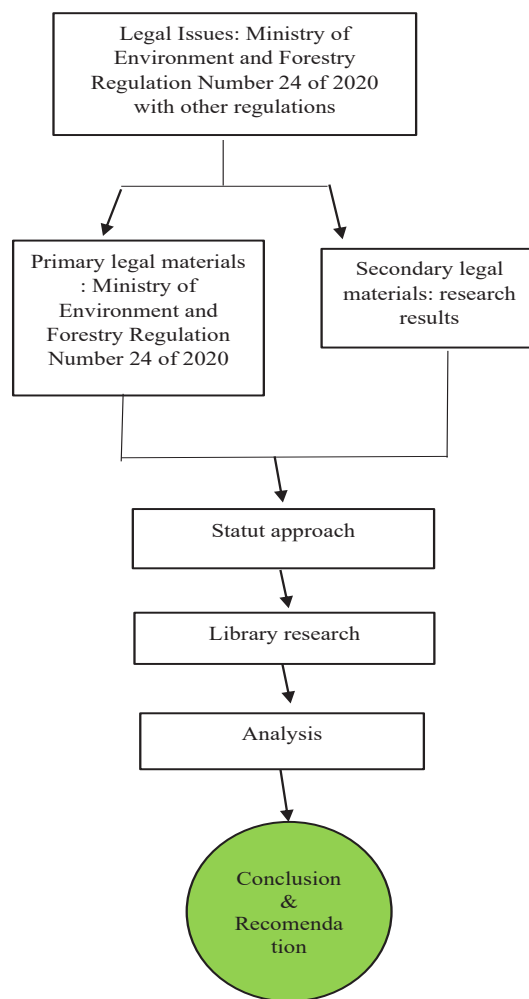


Source : EDGAR [7].

Sustainable forest management is essential to addressing climate change and supporting economic, social, and environmental goals. Indonesia's commitment to these goals is reflected in its Nationally Determined Contribution (NDC) under the Paris Agreement, which emphasizes the need to mitigate climate change and conserve forest cover. NDC – a Nationally Determined Contribution (NDC) document contains a country's climate commitments and actions communicated to the world through the United Nations Framework Convention on Climate Change (UNFCCC).

Based on the background description, this article aims to evaluate the policy implications of the Regulation of the Minister of Environment and Forestry (Permen LHK) No. 24 of 2020 concerning the development of food estates and propose a model based on village regulations to improve sustainable agricultural land protection.

## 2 Method



This research is normative. The purpose of this normative legal research is to analyze the legal materials obtained prescriptively, with the aim of producing new arguments, theories, or concepts as prescriptions for solving the problems faced. As stated by Soerjojo Soekanto, normative legal research tends to portray law as a prescriptive discipline, namely, viewing law from the perspective of norms [8]. In line with Soerjono's opinion, Peter Mahmud Marzuki stated that: ".....Normative legal research is carried out to produce new arguments, theories or concepts as prescriptions for solving the problems faced [9].

As a normative research, this study uses a statutory approach. The legal issues in this study were raised based on the contradiction of the Regulation of the Minister of Environment and Forestry (Permen LHK) No. 24 of 2020 concerning the development of food estates with several regulations, namely:

1. Law Number 41 of 1999 concerning Forestry mandates that forests, as one of the determinants of the life support system and a source of people's prosperity, tend to decline in condition. Therefore, their existence must be maintained optimally, and their carrying capacity must be maintained wisely, openly, and professionally.

2. Indonesia's commitment to the Kyoto Protocol (2005) and the Paris Agreement (2015), ratified under Law Number 16 of 2016. An essential component of the Law is Indonesia's commitment to these goals, as reflected in the Nationally Determined Contribution (NDC) under the Paris Agreement, which emphasizes the need to prevent climate change and conserve forest cover.
3. Presidential Regulation Number 98 of 2021 concerning implementing Carbon Economic Values for Achieving Nationally Determined Contribution Targets and Controlling Greenhouse Gas Emissions in National Development. In reality, Indonesia contributed 1.24 billion Gt CO<sub>2</sub>e in 2022, making it the world's 7th most significant greenhouse gas emitter.
4. Law Number 41 of 2009 concerning the Protection of Sustainable Food Agricultural Land. Through this Law, the Government has developed food estates by requiring regional governments to create regional regulations as a basis for the Village Government to implement the program.

Because this study aims to bring about changes in the form of recommendations, the analysis will not be free from the weaknesses or failures of the implementation of the food estate program in several regions in Indonesia. The insights gained from this research could potentially inform and improve the implementation of the food estate program in Indonesia.

The data collected were analyzed qualitatively using environmental conservation theories and principles. The conclusion drawing in this study uses inductive thinking logic, a conclusion drawn from something specific to something general. Permen LHK No. 24 of 2020 is assumed to be something specific, which develops food estates in protected forests and production forests about all relevant regulations as above, which generally regulate conflicting matters, namely preserving forests to prevent deforestation, climate change and controlling GHG emissions and preserving sustainable agricultural land.

Based on the results of the analysis, it is recommended that the food estate program development model be developed through village regulations. Through village regulations, it is hoped that the role of all stakeholders will be better accommodated because it does not reduce the area of forest cover and supports efforts to protect sustainable food agricultural land.

## 3 Results and discussions

### 3.1. Food estate policy

The people own the earth, water and natural resources within it, and the state is the trustee. The ideology of control and utilization of natural resources by the state is contained in Article 33 of the 1945 Constitution, especially paragraph (4). Explicitly, it determines that the national economy is run on economic democracy with the principles of togetherness, fair efficiency, sustainability, environmental insight, and independence,

as well as maintaining a balance of progress and national economic unity. Therefore, implementing all aspects of forestry must never forget the soul and spirit of the people, be sustainable and have an environmental perspective. These principles are implemented by allocating forests according to their functions into protected forests, production forests and conservation forests.

The provisions of Article 33 paragraph (4) of the 1945 Constitution, stipulated through the Fourth Amendment in 2002, have adopted the importance of sustainable and environmentally sound development principles. In connection with adopting these two principles, Jimly stated that the Indonesian people are not allowed to carry out development practices that damage nature and are not environmentally friendly. Jimly further said that if development policies conflict with the principles contained in the 1945 Constitution, the law or regulation can be cancelled through the constitutional justice mechanism at the Constitutional Court [10].

In the context of forest resources, the implementation of forest protection aims to protect forests, forest products, forest areas and their environment so that the protection, conservation, and production functions are achieved optimally and sustainably.

Food Estate is a large-scale food business which is a series of activities carried out to utilize natural resources through human efforts by using capital, technology and other resources to produce food products to meet human needs in an integrated manner, including food crops, horticulture, plantations, animal husbandry, and fisheries in a Forest Area. Moving on from the definition of food estate, forest areas can be planted with plantation crops and food crops, animal husbandry, fisheries and others. This is important to study because forest areas' characteristics differ from those of plantations.

Forests are said to act as life support because forests have functions including:

1. Forests, with their dense canopies, play a crucial role in regulating temperature by providing a vital oasis of shade on the ground. This function is often overlooked but is essential for maintaining a balanced ecosystem.
2. Trees in forest areas have a way to beat the heat, namely by absorbing CO<sub>2</sub>, which triggers global warming. Plants always need CO<sub>2</sub> for photosynthesis, and CO<sub>2</sub> is stored in wood, leaves, and soil. Currently, the air on earth is thick and full of emissions that trees must fight by breathing.
3. Large forests can influence regional weather patterns and create the forest's microclimate.
4. Strong tree roots can help the soil during heavy rain by absorbing water and slowing down the flow, thereby preventing soil loss and damage.
5. Forests are like giant sponges, capturing runoff rather than letting it run across the surface but can't absorb it all.
6. Deforestation disrupts the stabilizing effect of forest root networks on soil, leading to increased soil erosion. This can trigger new, life-threatening

problems like landslides and dust storms, underscoring the urgent need to protect our forests.

7. Besides holding soil in place, forests can also use phytoremediation to remove specific pollutants. Trees can absorb toxins or degrade them to make them less dangerous. This skill is valuable, allowing the tree to absorb sewage overflows, roadside spills, or contaminated runoff,
8. Forests can clean up air pollution on a large scale, and not just CO<sub>2</sub>. Trees absorb various air pollutants, including carbon monoxide, sulfur, and nitrogen dioxide [11].
9. Forests, often referred to as the 'lungs of the world', are a habitat for millions of trees and other plants. They absorb carbon dioxide and produce oxygen, a vital process that sustains life for humans and animals. This unique function of forests is a testament to their irreplaceable role in our ecosystem [12].

In forest areas, there are usually what are called "stands", namely units of trees or other plants that occupy a particular area and which have a composition of species, age and condition that is uniform enough to be distinguishable from the forest or different groups of plants next to or near it. Around that area [13]. The stand is the central part of the forest next to the "roof canopy" or "canopy". The canopy is a stand's top layer, consisting of vegetative parts. The canopy, which can be as high as 100 feet (30 m) above the ground, is formed by rainforest tree's overlapping branches and leaves. Researchers estimate that 70-90% of the life in a rainforest is found in the trees, making it the richest habitat for plant and animal life. Many famous animals, including monkeys, frogs, lizards, birds, sloths and small cats, are found in the canopy [14].

Meanwhile, plants that grow in plantation areas have different characteristics from those in forest areas, including poor hydraulic function of plantation plants. Several studies in Chile also stated that monoculture plants, even if they are trees, are not suitable as climate controllers. Monoculture plants absorb little carbon because they compete for it, not sharing it like natural forests that hold high biodiversity [15]. The plants in the plantations are pepper, cloves, oil palm, cotton, rubber, coffee, cocoa, sugar cane, tea, coconut and others. What becomes critical is if individual communities or corporations receive permits from "distribution" from the Government and flock to plant oil palm. Palm oil, which was initially a plantation crop, has become a forest crop, which is a concern for many parties. For those who oppose, these concerns are natural, considering that the characteristics of oil palm plants are indicated as a cause of deforestation [16]. This concern is justified based on the experience of the Merauke Integrated Food and Energy Estate (MIFEE) in Kab. Merauke. The MIFEE program, which was initiated by Regent Maerauke in 2007, is the implementation of a composition which, in the initial concept, was 70% food crops, 9% livestock, 8% fisheries, 8% plantations and 5% other commodities to become very dominant plantation crops [17].

### **3.2. Minister of Environment and Forestry Regulation (Permen LHK) Number 24 of 2020 concerning the Provision of Forest Areas for Food Estate Development**

The policy for implementing the food estate program is based on Government policy regarding handling the 2019 coronavirus disease (COVID-19) pandemic. In the Food Estate Smart Book, palm oil is one type of agricultural commodity that is a priority for development in food estates [18]. The reason why food estates are being developed, among others, is that Indonesia has potential land availability as a large area of food reserves, especially outside the islands of Java and Bali. Still, it has not been exploited optimally and requires significant investment capital. On the other hand, the Government needs the role of investors in developing it with a note that it continues to pay attention to/protect the local community's interests [19].

The Director General of Forestry Planning and Environmental Management, KLHK, Sigit Hardwinarto, explained several things as follows:

1. The concern about oil palm turning into a forest crop is valid. However, the designation of Forest Areas for Food Security (KHKP) is a clear indication of our commitment to food security. These areas, determined in Protected Forest and Production Forest areas, will not be released or turned into plantation crops. They will remain dedicated to ensuring food security.
2. The Protected Forest (HL) area chosen for the Food Estate is a carefully selected area that no longer serves its original fully protected function. It is an open/degraded area devoid of any standing forest. This strategic selection ensures the sustainability of the Food Estate program.
3. For graded protected forests, the food estate program will function as restoration (rehabilitation) of protected forest areas, with a pattern of combining forest plants (woody plants) with food crops known as agroforestry, a combination of forest plants with livestock known as wana livestock (sylvopasture), and the combination of forest plants with fisheries known as wana mina (sylvofishery) [20].

It is acknowledged that effective governance requires policies that balance economic interests on one hand while also taking into account environmental sustainability. One of the motivations for developing the food estate program is to enhance food security, with oil palm identified as a priority for development. This raises valid concerns that communities may increasingly choose to cultivate oil palm over other crops such as rice, corn, peanuts, sorghum, and others. Oil palm is a high-value commodity, contributing significantly to foreign exchange revenue through its export activities. Indonesia is recorded as the world's largest producer of palm oil [21]. However, according to research by a team from Duke University, oil palm cultivation contributes to 23% of deforestation in Indonesia [22].

The frameworks of food security and food sovereignty are interrelated. Within this framework, attention must be paid to the social structural elements

that condition the distribution of resources and opportunities that people and systems have for building resilience. In this regard, Dilley reminds us that food sovereignty embodies the concept of prioritizing local agricultural production and resource governance, emphasizing local autonomy, local markets, and community action (IAASTD 2009), that is, the local capacity to produce and consume socially and ecologically appropriate food [23].

The emergence of the Regulation of the Minister of Environment and Forestry (Permen LHK) Number 24 of 2020 concerning Forest Areas for Food Estate Development has raised concerns. This regulation determines forest areas for food security, which has the potential to reduce forest cover in Indonesia. The potential impact of the policy on deforestation and forest degradation could undermine Indonesia's efforts to achieve emission reduction targets and negatively impact ecosystem sustainability.

Government policy that allows oil palm cultivation through the food estate program, thereby reducing the area of forest cover. As is known, land cover dynamics in Indonesia are very high, especially in production and even protected forest areas. Apart from that, many Indonesian forest areas have experienced damage due to fires and encroachment by the community to meet their living needs [24]. Indonesia's forest cover area reaches 94.1 million hectares, with dominance in Sumatra (13.5 million), Kalimantan (26.7 million), and Papua 34 million hectares [25]. Food estate program policies that can reduce the area of cover can be qualified as state crimes. Green and Ward (2005) define state crime as 'illegal or deviant activities carried out by the state, or with the involvement of state institutions'. State crimes are committed by, or on behalf of, nation-states to achieve their policies [26]. This definition means that every politician or civil servant doing something deviant or illegal to pursue national policy in any field can be qualified as committing a state crime.

There needs to be more debate about the concept of state crime. Some define it as a state crime if the act in question violates an act described as a crime, while Ross believes it is sufficient if the act in question is "deviant, abusive, dangerous or wrong" [26]. Thus, Presidential Instruction (Inpres) Number 8 of 2018 concerning postponing and evaluating palm oil plantation permits and increasing productivity (oil palm moratorium) is the right step. The palm oil moratorium is a cessation of granting new permits to clear forests for oil palm plantations. Moratorium to prevent deforestation, forest and land fires, and the production of carbon emissions. In this regard, Rama Maulana reminded that during the moratorium, the government is obliged to reorganize palm oil plantation permits and palm oil plantations, especially palm oil plantations located in forest areas [27].

### **3.3. Presidential Regulation Number 98 of 2021 concerning Implementing the Economic Value of Carbon to Achieve Nationally Determined Contribution Targets and Control of**

## **Greenhouse Gas Emissions in National Development**

On October 29 2021, President Jokowi signed the ratification of Presidential Regulation Number 98 of 2021 concerning implementing the Economic Value of Carbon for Achieving Nationally Determined Contribution Targets and Controlling Greenhouse Gas Emissions in National Development. Based on Presidential Decree 98/2021 concerning the economic value of carbon, Indonesia has a regulatory basis for practising carbon trading. In the Presidential Decree on the Economic Value of Carbon, the scope of mitigating the climate crisis through reducing emissions covers the national, provincial and business sectors. Carbon trading business actors are ministries/institutions, provincial governments, business actors and the community. Indonesia has the largest forest after Brazil and Congo, so it has considerable carbon potential. Thus, Indonesia has the potential to obtain compensation from the carbon trade. Carbon trade is compensation provided by advanced industrial countries (carbon producers) to pay for environmental damage caused by carbon dioxide (CO<sub>2</sub>) smoke to countries that own forests (carbon absorbers). Based on forest area, Indonesia has 7.5 million hectares of peat land, 3.1 million ha of mangroves and 180 million ha of dry land forests, contributing to the world's absorption of carbon gas [28].

### **3.4. Evidence of the Failure of the Food Estate Program**

The failure of implementing the food estate program has been widely researched and analyzed, for example, in Central Kalimantan as written by Oknawati that: (1) the policy is only based on the Rapid-KLHS study, this worsens people's assumptions about the sustainability of this program. Therefore, differences arise between the Government and society so that the food estate program is in a position with a high threat of conflict in terms of policy positions; (2) There is minimal room for compromise and the complexity of the problems during the food estate project has never been resolved by the Government. The cries of the people this project harmed have never been heeded. The Director General of Forestry Planning and Environmental Management acknowledged that this policy was a national strategic program, which he said was urgent. President Joko Widodo is considered to be ignoring the role of the community in providing food, exacerbating land grabbing, and prone to environmental damage; (3) The cause of the conflict based on the content of the food estate project development policy is supported by Presidential Regulation Number 109 of 2020 and Minister of Environment and Forestry Regulation Number 24 of 2020, these two policies are very controversial, especially with Law No. 41 of 1999 concerning Forestry [29].

Research conducted by Silalahi et al. shows a similar condition. The study was conducted in Kapuas Regency. Several things need to be paid attention to: (1) The failure of this program was immediately given to the

community without understanding Serapat Baru Village first. Even though the condition of peat soil, soil with lots of puddles of water, lowlands, pests, poor irrigation, acidic soil levels, seeds that can be planted, fertilizers that are suitable for planting, even the need for farmer groups to understand how to practice the superior seeds provided, and how to planting rice in the village; (2) Orientation towards production growth (directed to harvest twice a year, even though farmers usually only harvest once a year); (3) The program implements a monologic relationship (a form of government intervention/East Kapuas District agricultural extension centre (BPP) on farmer groups) [30].

The research results by Mahardika et al. stated that the food estate program in Bahadur Tengah village, Kahayan Kuala District, Pulang Pisau Regency, failed. Because it is centralised, Bahadur Tengah Village, Kahayan Kuala District, and Pulang Pisau Regency need more space for the community, especially farmers who better understand local conditions, to give suggestions and input to improve the program. Therefore, it recommends that the government make policy changes, especially in policy implementation, to be more adaptive to local conditions [31].

Another failure is shown by the results of research conducted by Ayu, which focuses on the impact of the food estate program, namely:

- (1) It is indicated that the land-clearing process for the food estate is very likely to violate forestry and land management regulations. This can be seen from the environmental damage, the potential for increased conflict and land management that is not by the spatial plan of the province of Kalimantan as a whole;
- (2) Regulation of the Minister of Environment and Forestry Number 24 of 2020 has the potential to become an instrument that marginalizes the people if implemented without urgently considering the socio-ecological needs of Central Kalimantan as a whole;
- (3) Because the implementation of the food estate program is oriented towards the socio-economic needs of Central Kalimantan as a whole;
- (4) Land control by the private sector supported by the authority of the head of the institution or regional head with straightforward permit requirements has the potential to damage conservation areas and customary forests and trigger land control conflicts

Article 19 of Minister of Environment and Forestry Regulation Number 24 of 2020 regulates that protected forest areas for food security (KHKP) can be used for food estate activities with the conditions as stated in paragraph (2), namely that they do not have a fully protected function by statutory regulations. The Government intends this provision to be independent of the function of protected forests as regulated in Minister of Environment and Forestry Regulation Number 7 of 2021 concerning Forestry Planning, Changes in the Designation and Function of Forest Areas and Use of Forest Areas. In this regulation, a protected forest is defined as a forest area that mainly protects life support systems to regulate water management, prevent flooding, control erosion, prevent seawater intrusion and

maintain soil fertility. To develop an appropriate scheme for providing land for the food estate program in forest areas. Article 213 of the Ministerial Decree determines that protected forest areas can be set aside for food security by developing food estates. However, the criteria for "not fully functioning as a protector" have not yet been determined. Mutiaa reminded that the Government must play a role in controlling the implementation of the KHKP scheme so that the function of protected forest areas remains protected and Indonesia can continue to be committed to reducing greenhouse gas emissions in climate change efforts [32].

Meanwhile, Fianda et al., in implementing the food estate program in West Kalimantan, questioned the environmental impact, including inadequate infrastructure, limited access to technology, limited financing, and a less-than-optimal investment climate [33]. On the other hand, Apriliani et al. revealed a poignant aspect of the food estate program's implementation: the plight of farmers in Bulungan, North Kalimantan, who struggle with marketing their rice harvests [34].

### **3.5. Sustainable Food Agriculture Protection Program (LP2B)**

In essence, the food estate program is implemented to achieve food security. It is understood that as the population increases, the need for housing, industry, and so on increases. Hence, this has an impact on the conversion of agricultural land. To control many agricultural land conversions, the Government established a policy in Law No. 41 of 2009 concerning the Protection of Sustainable Food Agricultural Land. Sustainable Food Agriculture Areas are agricultural cultivation areas, especially in rural areas, which have stretches of Sustainable Food Agriculture Land and stretches of Sustainable Food Agriculture Reserve Land, as well as supporting elements with the primary function of supporting national food independence, resilience and sovereignty.

Food zones are large-scale agricultural initiatives that aim to harness natural resources for comprehensive food production. These zones can involve food crops, horticulture, plantations, livestock, and fisheries within forest areas. Unlike traditional plantations, food zones are designed to integrate various agricultural activities, recognizing the unique characteristics of the forest environment and the need for careful management to maintain ecological balance.

Several vital provisions in Law Number 41 of 2009 are:

- Sustainable Food Agricultural Land Planning is prepared at the national, provincial and district/city levels (Article 11 paragraph (1));
- National Sustainable Food Agricultural Land Planning becomes a reference for provincial and district/city Sustainable Food Agricultural Land planning (Article 12 paragraph (1));
- The inclusion of the Sustainable Food Agricultural Land Protection Plan in the Long Term

Development Plan (RPJP), Medium Term Development Plan (RPJM), and Annual Plans both nationally through Government Work Plans (RKP), provincial and district/city demonstrate a long-term commitment to sustainable land use.

However, not all regions have regional regulations regarding the protection of sustainable food agricultural land; for example Ponorogo district [35].

Regarding climate change, Malaysia also changed its policy-based strategy because it was understood that it was essential to link the impacts of climate change with the basic principles of food security. Establishing 8 (eight) Main rice barns with various interventions have been established as a strategic food security plan. Research conducted by Firdaus et al. found that various rice barn assistance programs have improved farmer welfare and reduced poverty. It is believed that such interventions help maintain the interest of rice farmers to continue cultivating their rice fields [36].

Meanwhile, Brazil shows the opposite. The implementation of public policies to implement food security, between 2000-2014, Brazil received international recognition from the Food and Agriculture Organization of the United Nations for successfully reducing the number of hungry people by half and removing the country from the hunger map. This success is supported by institutions that oversee public food security policies, for example, the Extraordinary Ministry for Food Security and Hunger Eradication, namely MESA, the National Council for Food Security and Nutrition CONSEA, and the Interministerial Chamber for Food Security and Nutrition [37].

Domingos' research also highlights subsequent policy developments. Since 2015, Brazil has experienced political instability, which has led to a weakening of public policies related to food insecurity. In 2013, there was an increase in food insecurity rates, which increased by around 8% per year until 2018. During this period (2015–2018), Brazil experienced the impeachment of the president of the republic, which led to instability, and began to dismantle food programs. In addition, in 2019, the republic's new president took unprotective actions related to food security, such as the dissolution of the National Council for Food Security and Nutrition. The new Brazilian government chose not to monitor food access measures. This left vulnerable groups facing hunger and food insecurity invisible. It also made it difficult for the population to access information and demand better government action [38].

Looking at what happened in Malaysia and Brazil, food sovereignty concerns power across scales, namely between regional and state institutions, and within these institutions, namely by paying attention to differentiation at the local level [39].

### **3.6. Food Estate Policy Model Based on Village Regulations**

Forest function change, also known as land conversion, is a change in part or all of the land function from its original function to another function that affects the

environment and the potential of the land itself. Food Estate is a large-scale food business which is a series of activities carried out to utilize natural resources through human efforts by using capital, technology and other resources to produce food products to meet human needs in an integrated manner, including food crops, horticulture, plantations, animal husbandry, and fisheries in a Forest Area. Moving on from the definition of food estate, forest areas can be planted with plantation crops and food crops, animal husbandry, fisheries and others. Food estate is one of the cultivation activities carried out with the concept of agriculture as an industrial system based on science and technology, capital, organization and modern management. The conversion of land from the impact of food estates will undoubtedly have a negative effect on forests and Indonesia's climate commitments, which are manifested in the NDC. Many experts state that food estates do not answer the food problem, especially as it will get worse if it is done by converting natural forests [40].

The Government's efforts to increase food security through the food estate program have been maximal. One of these was collaborating with China to develop one million hectares of rice fields in Central Kalimantan, but this failed [41]. There is nothing wrong with the Government taking lessons from the food estate industry in China. The food estate program is supported by government policy, namely by providing facilities for college graduates and young entrepreneurs to work in rural areas to "revitalize the rural economy." [42]

On the other hand, the government has determined to make villages the subject of development, so the regulations are intended to encourage village communities' initiative, movement, and participation in developing village potential and assets for shared prosperity. Law Number 6 of 2014 concerning Villages mandates that villages be regulated based on several principles, including independence, participation, empowerment and sustainability (Article 3 of the Village Law). There are still many villages that actually have a lot of potential but have not yet been developed. This untapped potential in many villages presents a significant opportunity for shared prosperity. Meanwhile, the implementation of Village Government is based on legal certainty, orderly government administration, orderly public interest, openness, proportionality, professionalism, accountability, effectiveness and efficiency, local wisdom and participativeness.

Paying close attention to the principles and objectives that animate the implementation of village government can be confident that it will be able to make "anything" a village. For example, suppose a village wants to achieve food security. In that case, it can develop by referring to Law No. 41 of 2009 concerning the Protection of Sustainable Food Agricultural Land and Regional Regulations prepared by the Regency/City where the village is located. Of course, this Regional Regulation regulates and facilitates how villages can obtain various incentives from the government, as recommended in the Academic Paper for the Formation

of Regional Regulations on the Protection of Sustainable Food Agricultural Land in Ponorogo Regency [43].

In terms of determining potential locations as sustainable food farming areas, agricultural cultivation areas are selected, especially in rural areas that have stretches of Sustainable Food Farming Land and/or stretches of Sustainable Food Farming Reserve Land, as well as supporting elements with the main function of supporting food independence, resilience, and sovereignty [44].

Law Number 41 of 2009 defines Sustainable Food Agriculture Areas (KP2B) as agricultural cultivation areas, especially in rural areas with LP2B and LCP2B stretches and supporting elements to support national food independence, resilience and sovereignty. Sustainable Food Agricultural Land (LP2B) is an area designated to be protected and developed consistently to produce staple food for national food independence, resilience and sovereignty. Meanwhile, Sustainable Food Agriculture Reserve Land (LCP2B) is potential land whose use is protected so that its suitability and availability remain controlled for use as LP2B. Implementing Law Number 41 of 2009 requires regional governments (districts/cities) to issue Regional RTRW and LP2B Regional Regulations equipped with spatial data [45].

Considering the large amount of evidence of implementation failures and potential conflicts in the food estate program, an implementation model based on village regulations could be an alternative. Village Regulations will refer to Regional Regulations, which regulate sustainable food farming land, which is an implementation of Law Number 41 of 2009. Village regulations will have advantages over the food estate program based on Minister of Environment and Forestry Regulation No. 7 of 2021 concerning Forestry Planning, Changes in the Use and Function of Forest Areas, and Use of Forest Areas. If the Village Regulation is the basis for establishing a food estate, it will have the following advantages:

1. The drafting of Village Regulations, which involves community participation, ensures that the formation of a food estate is based on the specific needs of the community. This approach, in contrast to the government-formed food estate, which was deemed a national strategic program without adequate community involvement, is more likely to lead to a successful and sustainable food estate.
2. The government-formed food estate is centralized and needs a platform for farmer communication despite their superior understanding of local conditions. This oversight must improve the potential for a successful and sustainable food estate.
3. Limited agricultural land is an obstacle for the government in developing this program. Forest areas can be used for food estate programs, as regulated in Ministerial Regulation Number 7 of 2021 through the forest area scheme for food security. Law Number 41 of 2009 can overcome this land limitation, which Regional Regulations and Village Regulations further implement. With Village

Regulations, the rate of deforestation can be avoided, thereby bringing Indonesia closer to fulfilling its commitment to the Paris Convention on preventing global climate change.

The implementation of the food estate program based on village regulations will be "closer" to the community, and this is in line with the alternative initiated by Miraj et al., namely through cash waqf [46].

## 4 Conclusion and recommendation

### 4.1 Conclusion

Based on the analysis, it was concluded that developing food barns based on Village Regulations is a more effective strategy than other approaches. This method offers several significant advantages:

**Deforestation Control:** By complying with Village Regulations, the rate of deforestation can be effectively managed, helping to conserve critical forest areas.

**Prevention of Agricultural Land Conversion:** Village-based food areas help prevent the conversion of valuable agricultural land to non-agricultural land, thus maintaining important food production areas.

**Greenhouse Gas Emission Reduction:** Implementing this approach contributes to reducing greenhouse gas emissions, addressing one of the significant environmental problems related to land conversion and forest fires.

**Support for Global Commitments:** This strategy plays a pivotal role in strengthening Indonesia's commitment to the Paris Agreement. By reducing the impacts of climate change, it addresses the main sources of greenhouse gas emissions, which account for 63% of emissions.

Indonesia needs to carefully design and implement policies that respect environmental and development goals to protect sustainable agricultural land while supporting food security. Collaboration among stakeholders and adherence to a strong regulatory framework are essential for success.

### 4.2 Recommendation

A balanced policy model is needed to align food estate development with sustainable land protection. Through village regulations, agricultural development objectives must be integrated with forest area and biodiversity conservation. Village regulations that are prepared must include the following:

1. Integration of Environmental and Agricultural Targets:

Develop policies that integrate environmental conservation with agricultural development. This includes sustainable land management practices that prevent deforestation while increasing food security.

2. Stakeholder Engagement:

Involve stakeholders, including local communities, environmental organizations, and agricultural producers, in decision-making to ensure that the policy addresses multiple interests and issues.

### 3. Monitoring and Evaluation:

Implement a robust monitoring and evaluation system to track the impact of food forest area development on forest areas and GHG emissions. Regular assessments can help adjust policies and practices to reduce negative impacts.

### 4. Incentives for Sustainable Practices:

Provide incentives to adopt sustainable agricultural practices that contribute to forest conservation. This can include financial support, technical assistance, and recognition for practices that increase productivity and environmental protection.

Village regulations exist to strengthen the legal and regulatory framework and ensure that forest protection measures can be enforced and that the development of food forest areas complies with environmental standards.

## Reference

1. Adi Ahdiat, *10 Penyebab Deforestasi Di Indonesia, Dari Sawit Hingga Lapangan Golf*, (2019), [https://kbr.id/Berita/Nasional/10\\_Penyebab\\_Deforestasi\\_Di\\_Indonesia\\_Dari\\_Sawit\\_Hingga\\_Lapangan\\_Golf](https://kbr.id/Berita/Nasional/10_Penyebab_Deforestasi_Di_Indonesia_Dari_Sawit_Hingga_Lapangan_Golf), Accessed July 9, 2024
2. Katriani Puspita Ayu, *Kebijakan Perubahan Lahan Dalam Pembangunan Food Estate Di Kalimantan Tengah*, Politik Dan Pemerintahan, Vol. 11, (2022), <https://doi.org/10.37304/jispar.v11i1.4203>
3. Ayu Mutia, An Nissa, Ida Nurlinda, And Nadia Astriani, *Pengaturan Pembangunan Food Estate Pada Kawasan Hutan Untuk Mewujudkan Ketahanan Pangan Di Indonesia*, Bina Hukum Lingkungan, Vol. 6, No. 2, Pp. 224-240, (2022), <https://doi.org/10.24970/Bhl.V6i2.259>
4. Subjek Definisi, *Pengertian Tegakan Adalah*, (N.D.), <https://glosarium.org/arti-tegakan/>
5. Ana Tereza Souza Domingos, *Brazil's Return To The Hunger Map: An Analysis Of Public Policies And Effective Measures For Food Security*, Laws, Vol. 12, Pp. 90, (2023)
6. R.B. Radin Firdaus, *Paddy, Rice And Food Security In Malaysia: A Review Of Climate Change Impact*, Cogent Social Science, (2020)
7. Ode Mahardhika, Nurul Azkar, Erma Ariyani, Program Administrasi Publik, And Universitas Lambung Mangkurat, *Implementasi Program Food Estate Di Desa Bahaur Tengah, Kecamatan Kahayan Kuala Kabupaten Pulang Pisau*, Jpp: Jurnal Administrasi Publik Dan Pembangunan, Vol. 5, No. 1, Pp. 48-56, (2023), <https://doi.org/10.20527/jpp.v5i1.8018>
8. Marygold Walsh-Dilley, Et Al., *Rights For Resilience: Food Sovereignty, Power, And Resilience In Development Practice*, Ecology And Society, (2016), Vol. 11
9. Aliya Oknawati, *Analisis Konflik: Program Food Estate Dalam Proyek Strategi Nasional (Psn)*, (N.D.), <https://www.researchgate.net/publication/364376589>
10. Clayton Peoples And James E. Sutton, *Political Corruption And State Crime*, In Oxford Research Encyclopedia Of Criminology And Criminal Justice, Oxford University Press, (2017), <https://doi.org/10.1093/acrefore/9780190264079.013.274>
11. Rancangan Peraturan Daerah Tentang Perlindungan Lahan Dan Pertanian Pangan Berkelanjutan, *Naskah Akademik*, (2018)
12. Atalya Puspa, *Klhk: Permen Lhk Nomor 24 Tahun 2020 Jadi Pedoman Food Estate*, (N.D.), <https://mediaindonesia.com/humaniora/361434/klhk-permen-lhk-nomor-24-tahun-2020-jadi-pedoman-food-estate>, Accessed July 9, 2024
13. Robby Irfany Maqoma, *Mengapa Sejumlah Ahli Justru Mendukung Kelapa Sawit Menjadi Tanaman Hutan*, (2021), <https://theconversation.com/mengapa-sejumlah-ahli-justeru-mendukung-kelapa-sawit-menjadi-tanaman-hutan-173120>, Accessed July 9, 2024
14. Mas Achmad Santosa In Jimly Asshiddiqie, *Green Constitution Nuansa Hijau Undang-Undang Dasar Negara Republik Indonesia Tahun 1945*, Rajawali Press, (N.D.), P. V
15. Pramono Dwi Susetyo, *Sawit Menjadi Tanaman Hutan. Untuk Apa? Seorang Profesor Ipb Usul Agar Sawit Menjadi Tanaman Hutan. Apa Untungnya?*, (N.D.), <https://www.forestdigest.com/detail/1353/sawit-tanaman-hutan>
16. Wartiningih, *Pidana Kehutanan-Keterlibatan Dan Pertanggungjawaban Penyelenggara Kebijakan Kejutanan*, Setara Press, (2014)
17. Agnes Z. Yonatan, *Indonesia Jadi Salah Satu Penyumbang Emisi Gas Rumah Kaca Terbesar Di Dunia*, (2023), <https://data.goodstats.id/statistic/indonesia-jadi-salah-satu-penyumbang-emisi-gas-rumah-kaca-terbesar-di-dunia-fscdv>
18. Yoga Ali Fianda, Arif, Katherine Yuliana Marpaung, Muhammad Shaquille Wildanwan, Ageiliana Tri Pamilih, And Muhammad Taufan Iskandar, *Proyeksi Dampak Sosial, Ekonomi, Dan Lingkungan Program Food Estate Di Kalimantan Barat Berbasis Kajian Literature Review*, (N.D.)
19. *2.2.-Paparannya Lp2b Dr.-Erma-Suryani Rev*, (N.D.) □ *4 Alasan Mengapa Moratorium Sawit Mesti Diperpanjang*, (2021), <https://www.forestdigest.com/detail/1321/moratorium-sawit-mesti-diperpanjang>, Accessed July 9, 2024
20. *10290-Article Edi Santosa*, (N.D.)
21. *Apa Yang Terjadi Jika Seluruh Pohon Dan Hutan Di Bumi Habis*, (N.D.)
22. *Apakah Kanopi Itu?*, (2024), <http://indonesia.mongabay.com/rainforests/kids/>

- 004.Html#:~:Text=Kanopi%2c%20yang%20bisa%20berada%20di%20ketinggian%20100%20kaki,M enjadi%20habitat%20terkaya%20bagi%20kehidup an%20tumbuhan%20dan%20hewan, Accessed July 9, 2024
23. *Buku Pintar Fe*, (N.D.)
  24. *First Nationally Determined Contribution Republic Of Indonesia*, (2016)
  25. *Https State Crime*, (N.D.), <https://www.bing.com/search?q=State+Crimes+Definition&form=Qsre4>, Accessed July 9, 2024
  26. *Madani News*, (N.D.)
  27. *Menghitung Potensi Nilai Ekonomi Karbon Yang Bisa Diperoleh Indonesia*, (2020), <https://klikhijau.com/menghitung-potensi-nilai-ekonomi-karbon-yang-bisa-diperoleh-indonesia/>, Accessed July 9, 2024
  28. *Menghitung Potensi Nilai Ekonomi Karbon Yang Bisa Diperoleh Indonesia*, (N.D.), <https://klikhijau.com/read/menghitung-potensi-nilai-ekonomi-karbon-yang-bisa-diperoleh-indonesia/>
  29. *Pandemi Covid-19, Emisi Gas Rumah Kaca Nasional Turun Drastis*, (2022), <https://agroindonesia.co.id/>
  30. *Pemerintah Susun Aturan Nilai Ekonomi Karbon*, (2020), <https://www.mongabay.co.id/2020/11/07/pemerintah-susun-aturan-nilai-ekonomi-karbon-berikut-masukan-mereka/>, Accessed July 9, 2024
  31. *Perjanjian Paris*, (N.D.)
  32. *Riesta Yogahastama*, (N.D.)
  33. *Russell-Forest*, (N.D.)