Management of agricultural land to support sustainable agriculture in North Sumatra

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Abstract. Indonesia is an agricultural country with an abundant natural wealth of agricultural products. Moreover, it stays in a strategic geographical position, located in the tropical climate, and having high rainfall. Competent agricultural enterprise management can help in adapting to the ever-changing human needs. It can also maintain and even improve the quality of the environment. To maximize natural resource management, land management is a necessity. Land management is affected by several factors, namely society and its activities such as factory operations and activities. As society continues to develop, many lands have been misused. One of them is the conversion of agricultural lands into residential or infrastructural lands. The problem in this study is the management of agricultural land to support sustainable agriculture in North Sumatra. This research uses a normative juridical method through literature studies of laws and regulations on agriculture and spatial planning. The results show that the existence of unproductive agricultural lands and paddy land conversion to residential dwelling can be detrimental to farmers. In conclusion, agricultural land governance is needed to support sustainable agriculture in North Sumatra. The research suggests a need for regulations regarding the management of agricultural land in North Sumatra to realize sustainable agriculture.

1. Introduction
Indonesia is known as an agrarian country, meaning that its agricultural sector plays an important role. It is endowed with abundant natural wealth and a strategic geographical position. Indonesia is located in a tropical area with high levels of rainfall, enabling many types of plants to live and grow quickly. Being an agrarian country, many Indonesians live off agriculture or farming. Indonesia produces a variety of export commodities, including rice, corn, soybeans, vegetables, chili, sweet potatoes, and cassava. In the plantation sector, Indonesia produces oil palm, tobacco, cotton, coffee, and sugarcane.

The availability of land for agriculture is a major factor in producing food. Agricultural land is a source of economy. The need for agricultural land continues to increase along with development. Land use depends on the development plan of an area. Therefore, development needs to use lands that are most accommodating and should be managed appropriately in order to support the ever-developing public activities [1].

Paddy fields are one of the production factors in rice farming. The majority of North Sumatra citizens consume rice as their main food, so its production must be attended to. Rice field area is a dominant factor in increasing rice production (extensification). Gradually, rice fields will continue to diminish or undergo land conversions.

The decrease of paddy fields in North Sumatra in 2012-2017 can be seen in the chart below:
In 2017, the total area of paddy fields in North Sumatra was 427,262 hectares in which 97.51% was planted with rice while 2.49% was not. Compared to 2016, the total area has reduced by 1.77% or 7,704 hectares. From 2012 to 2017, the paddy field area has decreased by 1.67% per year. Such conditions reflect the increasingly high rate of land conversion during the last 5 (five) years in North Sumatra [3].

Based on the 2015 Provisional Figures, North Sumatra is one of the national food barns. It was ranked 6th (sixth) nationally in rice production with a production of 4,000,000 tons, ranked 4th (fourth) nationally in corn production with a production of 1,500,000 tons, ranked 7th (seventh) nationally in green bean production with a production of 3,000 tons, ranked 5th (fifth) nationally in cassava production with a production of 1,600,000 tons and ranked 6th (sixth) nationally in sweet potato production with a production of 122,000 tons.

**Figure 1.** Development of paddy fields in North Sumatra the year of 2012-2017 [2].

**Figure 2.** Top 10 provinces with the largest rice production in 2017 [3].
East Java holds the largest rice barn in Indonesia. Based on data obtained from the Ministry of Agriculture, the rice production of the province is 13,130,000 tons or 16.1% of the total national production. The second-largest national rice barn is located in West Java with a production of 12,520,000 tons or 15.38% of the total national production. Central Java holds the third-largest rice barn with a production of 11,420,000 tons or 14% of the total national production. North Sumatra ranks fifth with a production of 5,100,000 tons [3].

The paddy land conversion to residential can have a negative impact on agricultural development, namely reduced agricultural production capacity, damaged irrigation in surrounding areas, and loss of investment in the form of reservoirs, irrigation networks, and new wetland opening [4].

Land availability is protected and guaranteed by Law No. 41 Year 2009 concerning the Protection of Sustainable Food Agricultural Land and its supporting Government Regulations (GR). GR No. 1/2011 concerning Determination and Conversion of Sustainable Food Agriculture Land Function, GR No 12/2012 concerning Incentives for the Protection of Sustainable Agricultural Land, GR No. 25/2012 concerning Sustainable Agriculture Land Information System, GR No. 30/2012 concerning Financing for the Protection of Sustainable Food Agricultural Land and Ministry of Agriculture Regulation No. 07 Year 2012 concerning Technical Guidelines on Criteria and Requirements for Area, Land, and Land Reserves for Sustainable Food Agriculture have been issued. Furthermore, the Ministry of Agriculture actively participates in the implementation of National, Provincial, and Regency/City Spatial Plans. North Sumatra Regional Regulation No. 3 of 2015 concerning Protection of Sustainable Food Agricultural Land aims at protecting agricultural land for food crops in a sustainable manner so that independence, food security and sovereignty, ownership protection of farmer-owned agricultural lands, farmer welfare improvements, ecological balance, and agricultural revitalization can be realized [5].

According to the North Sumatra Institute of Policy Studies and Advocacy (IPSA), approximately 4.2% of food agricultural land in North Sumatra has been converted to other uses, mainly for perennial plantation. Every year, this condition has declined food production in the region by 20%. The high rate of land conversion is a direct impact of the palm oil industry growth in North Sumatra. The rate of agricultural land conversion has declined compared to the previous period. Nevertheless, food security in North Sumatra is still threatened [6].

In general, the land is converted to oil palm plantations and other sub-sectors outside the food crop agriculture sector. However, these conversions have declined the national rice production. The high rate of land conversions is partly due to the absence of damaged agricultural land rehabilitation by the local government. In addition, farmers lack agricultural facilities and infrastructure and are faced with many pests that attack food crops. These conditions cause them to convert or even sell their lands.

There have been ongoing discussions and handling of agricultural land conversion. To date, there has not been a successful realization of land use regulation. To address this, Sustainable Food Agricultural Land (SFAL) needs to be maintained in order to protect sustainable rice fields [7].

In dealing with land conversions, good agricultural land management is needed so that sustainable agriculture in North Sumatra can be realized. This study aims at finding suitable land management methods to be implemented by the government, hence the title: “Management of Agricultural Land to Support Sustainable Agriculture in North Sumatra” is very important.

2. Materials and methods
This is normative legal research [8] utilizing a descriptive analysis method [9]. Data were collected using literary techniques [10]. It is then analyzed using a qualitative analysis method [11].

3. Results and discussion
So far, the policy for providing agricultural land in Indonesia has focused on two efforts, namely: management of paddy conversion and expansion of paddy fields to compensate for the reduction due to land conversion. Law Number 41 the Year 2009 concerning Protection of Sustainable Food Agricultural Land requires each district/city to determine the area of sustainable food agriculture,
namely agricultural land that is actively protected and developed to produce staple food. Besides, each district/city must also conserve and protect agricultural land that has the potential to be developed into sustainable food agriculture. However, this has not been implemented in most districts/cities due to various problems [12].

Land conversion is not only caused by the interest of farmers in oil palm but mainly because of the many problems faced in food agriculture. Inadequate water supply, unreliable selling prices, lost and expensive fertilizers, natural disasters, pest attacks, and other cultivation issues are some of many other problems faced by farmers. The government must be able to accommodate these conditions by rehabilitating agricultural land and enacting strategic and technical regulations that prohibit the conversion of food agricultural land. The government must also provide support for cultivation and build agricultural infrastructure such as irrigation and roads leading to agricultural areas [6].

Strategic steps are needed to increase food production. Incentives need to be provided to food farmers, whether in the form of price guarantees, fertilizers or seed subsidies. Agricultural infrastructures, especially irrigation, should be built and rehabilitated as quickly as possible.

3.1. Guidelines for sustainable agricultural land facility protection
Article 18 of Law No. 41 of 2009 concerning Protection of Sustainable Food Land has mandated the establishment of Sustainable Food Agricultural Land (SFAL), sustainable food agriculture areas regulated in the Spatial Planning and Territory (SPT) of the nation, provinces and regencies/cities. Article 44 explains that land that has been designated as SFAL is protected and prohibited from being converted, aside from conversions for public use. Sustainable Food Agricultural Land (SFAL) can only be converted after undergoing a strategic feasibility study, conversion plans, owner release, and replacement land provision.

The implementing regulation of Article 18 of Law No. 41 of 2009 namely Article 2 of Government Regulation No. 26 of 2008 concerning National Spatial Planning and Territory states that the purpose of national spatial planning is to ensure that the integrated control of national, provincial, and district/city spatial use protects spatial functions and prevents negative impacts. If the use of space is not in accordance with Spatial Planning and Territory (SPT), it can either directly or indirectly cause changes in the physical nature of the environment which results in the inability of the environment in supporting sustainable development.

In addition, the Government has issued Government Regulation No. 1 of 2011 concerning the Determination and Conversion of Sustainable Agricultural Land. This regulation oversees the establishment and conversion of sustainable food agriculture land. Article 3 states that this regulation serves to realize and guarantee the availability of sustainable food agriculture land, control sustainable food agriculture land conversions, and realize independence, food security, and sovereignty. Article 35 paragraph (1) states that land that has been designated as Sustainable Food Agricultural Land (SFAL) must be protected and is prohibited from being converted. Article 36 reaffirms that SPT must be taken into account in the conversion of Sustainable Food Agricultural Land (SFAL) for public services. Therefore, it is clear that the conversion of Sustainable Food Agricultural Land (SFAL) into residential land is strictly prohibited.

The purpose of this regulation is to protect and prohibit sustainable food agriculture land from being converted. Conversions can only be done by the Government or Regional Government to develop public facilities or in the occurrence of a disaster.

3.2. Guidelines for sustainable agricultural land facility protection in North Sumatera
To support Sustainable Food Agricultural Land (SFAL), the North Sumatra Provincial Government has issued Province Regulation No. 3 of 2015 concerning Protection of Sustainable Food Agriculture Land. This regulation aims at sustaining food agricultural lands to realize independence, food security and sovereignty, ownership protection of farmer-owned agricultural lands, farmer welfare improvements, ecological balance, and agricultural revitalization.

The high level of land conversion in North Sumatra is one of the obstacles in meeting the food needs of its 13,937,797 citizens. To overcome this, the North Sumatra Regional Government has
issued Regional Regulation No. 3 of 2015 which is expected to maintain the existence of agricultural land and ultimately realize and maintain food security. Food agriculture land designated as Sustainable Food Agricultural Land (SFAL) agricultural land may include irrigated, non-irrigated, tidal, and non-tidal swamp reclamation lands.

The acceleration of agricultural land conversion is fundamentally caused by a number of factors, namely the non-interference of the government, population growth, public needs for residential areas, high costs of agricultural operations, unstable agricultural prices, lack of interest of the younger generation in agricultural land management, conversion to more profitable sectors, weak land conversion regulations, low land rent value, weak laws and regulations, and the leniency of relevant institutions.

Agricultural land conversion can decrease agricultural land, decrease national food production, threaten the balance of the ecosystem, cause agricultural infrastructure to become unused, cause unemployment for many farmworkers, increase food prices, and cause high rates of urbanization.

In order to prevent the acceleration of agricultural land conversion on abandoned land, the principle of saving land needs to be applied to industry, housing, and trade lands. Other efforts include limiting the conversion of productive agricultural land, absorbing labor, converting less productive land, limiting conversion according to the supply of independent food in the regency/city, and establishing perennial food areas with incentives for landowners and the Regional Government.

4. Conclusions

Agricultural land should be protected from conversion through zoning, even if at any point the land has ceased to function. Currently, land protection is determined based on its physical condition. This is relatively easy to manipulate, which causes land conversions to not violate applicable regulations. Existing regulations do not have clear sanctions, in both dimensional and criminal sanctions. The North Sumatra Regional Government and the Department of Agriculture should protect Sustainable Food Agricultural Land (SFAL)’s to prevent large-scale land conversions that threaten food stability. The regional government should also revisit regulations regarding agricultural land protection. Law Enforcement Officials, in this case, the National Police should enforce the law against those who violate Law No. 41 of 2009 concerning Sustainable Food Land Protection.

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**Acknowledgements**
This research has supported by our advisor and the student of Doctoral Program of Law in Universitas Sumatra Utara.