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Incentive and disincentive for protection of sustainable food agricultural land in Cilegon city

Sirajuddin[1], Cep Jandi Anwar[2*], Tatang Sutisna[3], Asep Ridwan[1]

[1]*Industrial Engineering, Universitas Sultan Ageng Tirtayasa, Serang, Indonesia*
[2]*Economics and Development Studies, Universitas Sultan Ageng Tirtayasa, Serang, Indonesia*
[3]*Agribusiness, Universitas Sultan Ageng Tirtayasa, Serang, Indonesia*

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ABSTRACT

This study examines the application of sustainable food on agricultural land in Cilegon City. This study also analyzes the factors contributing to land conversion, productivity issues, and incentives and disincentives for the protection of sustainable food agricultural land in Cibeber, Jombang, and Purwakarta districts. In Cilegon city, most of the sustainable food agricultural land areas are not owned by the local government but by citizens. This condition makes the land vulnerable to being converted by landowners for non-agricultural uses. The existence should be strengthened with space utilization control instruments as a technical rule to prevent agricultural land conversion from developing and violating the spatial designation determined in the spatial plan. This study uses a parallel mixed method namely in the form of spatial methods and qualitative methods. This study found the factors that determine agricultural incentives and disincentives in the three districts in Cilegon City so that these factors can be used in determining the types of incentives and disincentives influencing land owners to defend land his farm. The factors obtained are derived from the variable based on the literature review synthesis. The variable is asked to the respondents until the variables are consensus. The results showed some economic and non-economic factors that determine agricultural land conversions, such as farmers' family necessities of life, housing development, and low agricultural land productivity. Some incentives for farmers can be supplied by providing services and infrastructure to support farmlands, such as irrigation, water jet pump, fertilizers and seeds, and marketing aid to protect agricultural land from conversion. Some disincentives, such as higher taxes and tighter building permits, should be imposed on agricultural land conversion. This study provides recommendations to protect sustainable food agricultural land. Furthermore, it promotes detailed agrarian reform and equalizes perceptions among Regional Apparatus Organizations. It also disseminates information to the community and updates the mapping of water sources. Finally, it promotes the issuance of local government law of Protection of Sustainable Food Agricultural land.

* Corresponding author
Email : cepjandianwar@untirta.ac.id
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INTRODUCTION

Food security is one of the crucial programs in a country that needs special attention (Santeramo 2015; Lanaerts et al. 2019). According to Garnett (2014), sustainable food availability will be a strength and a source of adequate nutrition to improve human resources quality. However, one of the problems concerning food security is the decline in production levels of agricultural products due to land conversion (Pitaloka 2020). Rondhi (2019) and Prayitno et al. (2021) stated that several factors contribute to this conversion, including the following: rice fields that have been converted to non-agricultural utility are permanent or never returned; creating new fields for the selection of food production in its original condition takes a long time; land resources that can be used are becoming increasingly limited, particularly on Java Island; and stagnation of technological innovation to increase the productivity of food crops, particularly rice.

Several studies identified factors that influence the conversion of agricultural to non-agricultural land, including lowland rice productivity, area of irrigated paddy fields, the contribution of the non-agricultural sector, government policies, economy, social, Myopic behavior, population, land requirements, environmental degradation, law, and the rate of urbanization (Nuraeni et al. 2018; Rondhi 2019; Prayitno et al. 2021). Three main challenges are controlling agricultural land conversion contradictory policies, limited policy coverage, and planning consistency constraints (Ustaogle and Williams 2017; Wang and Shen 2017). The phenomenon needs strict attention and control because it relates to various aspects such as farmer welfare, food security, causing technical, economic, and cultural losses, decreasing environmental carrying capacity, and causing conflicts between sectors. These obstacles must be considered because agricultural land affects food availability as one of the basic human needs (Zakaria and Rachman 2013: Syuaib 2016).

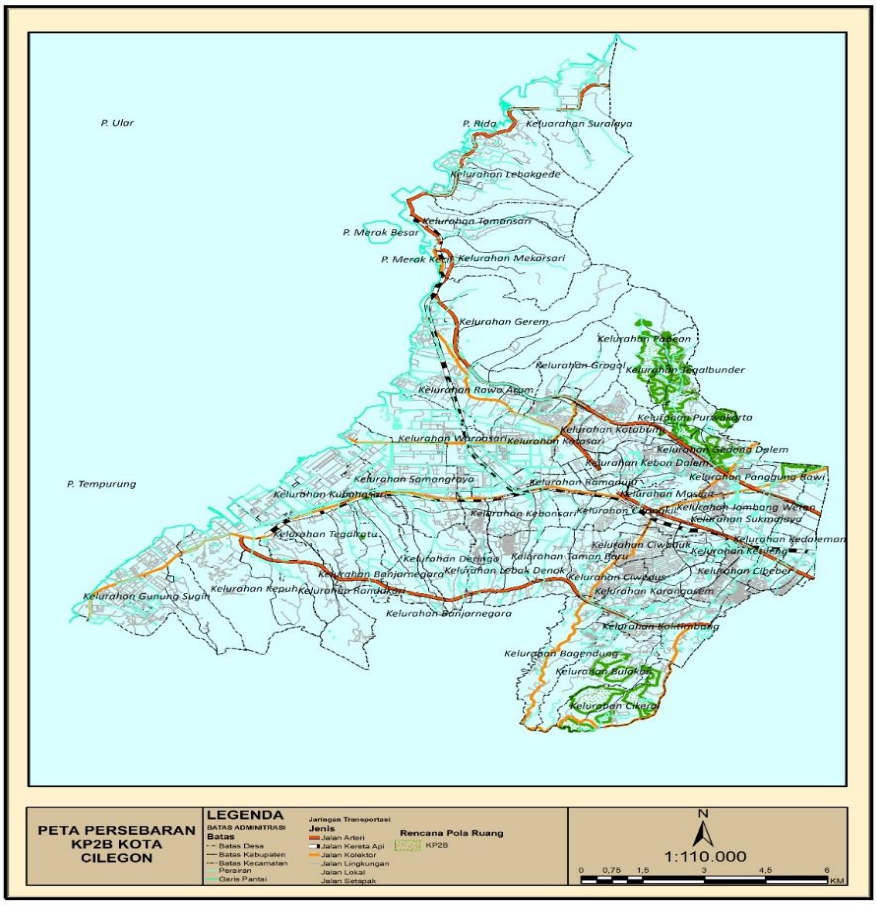

Figure 1 Map of Sustainable Food Agricultural Land in Regional Spatial Plan of Cilegon City

As a result, the government has issued various regulations related to land use to control the conversion of agricultural land, including Law no. 41 of 2009 concerning Protection of Sustainable Food Agricultural Land, Regulation Number 12 of 2012 concerning Incentives for Protection of Sustainable Food Agricultural Land. At the regional level, the government of Banten has released Regional Regulation No. 5 of 2015 concerning the Protection of Sustainable Food Agricultural Land in Banten Province. Then, the Government of Cilegon City also established a Sustainable Food Agriculture Area through Regional Regulation Number 1 of 2020 concerning the Cilegon City Regional Spatial Plan 2020-2040.

Based on the regional spatial plan of Cilegon City for 2020-2040, sustainable food agriculture areas have a stretch reserve, with the primary function to support national food independence, resilience, and sovereignty. In Article 28 of this regulation, the sustainable food agricultural land in Cilegon City consists of an area of 304 Ha, which includes Cibeber, Jombang, and Purwakarta Districts. In the regional medium-term development plan for Cilegon City in 2016-2021, Cibeber and Purwakarta Districts are developed as wetland areas and designated as Sustainable Food Agricultural Land. Therefore, this sustainable agricultural land should be protected and developed consistently to produce staple food for self-reliance, security, and national food sovereignty (McMichael 2015; Mbunda 2016; Wittman and Blesh 2017). However, the regulations on land conversion are less effective in suppressing the rate; therefore, such areas need further study.

In Cilegon city, most of the sustainable food agricultural land areas are not owned by the local government but by citizens. This condition makes the land vulnerable to being converted by landowners for non-agricultural uses. The existence should be strengthened with space utilization control instruments as a technical rule to prevent agricultural land conversion from developing and violating the spatial designation determined in the spatial plan (Digdowiseiso et al. 2018). The government needs strategies to suppress the conversion of sustainable agricultural land, such as providing incentives and disincentives to landowners or communities (Zakaria and Rachman 2013: Karim and Ariastita 2017). Therefore, this study will discuss the application of incentives and disincentives to oversee the implementation of protection for Sustainable Food Agricultural Land in Cilegon City. These incentives and disincentives would be proposed as compensation for land owners who enter the area so as not to convert land for non-agricultural activities uses. According to Government Regulation 12 of 2012 concerning the Protection of Sustainable Food Agricultural Land, one way to control space utilization is through incentives and disincentives. The Application of Sustainable Food Agricultural Land will also be discussed based on the characteristics and needs of each region. In addition, the study will identify the factors causing land conversion, formulate policy recommendations for each region's use of space, and determine the program for implementing incentives and disincentives in controlling the spatial use of sustainable food agriculture areas.

METHODOLOGY

This study uses a parallel mixed method namely in the form of spatial methods and qualitative methods (Nugara and Rudiarto, 2017). In this method, the researcher collects spatial and qualitative data, analyzes them separately, and then looks at the relationship between the findings. The method used includes qualitative and quantitative approaches (Creswell 2016). The qualitative approach is to group the data according to the quality of the truth (Miller et al. 2018).

The method used includes qualitative and quantitative approaches. The qualitative approach is to group the data according to the quality of the truth (Miller et al. 2018). Furthermore, the data will be analyzed quantitatively and compared with the theories obtained from the literature study. The systematics are as follows:

1. Data collection;

The secondary data were obtained from various publications such as the Central Bureau of Statistics, Cilegon City Government, and other agencies related to this study. Furthermore, primary data was obtained through direct interviews with landowners. The documentation method was conducted by reading, understanding, and studying various publications and related laws and regulations. The data collection technique used was documentation, consisting of several facts and data recorded in materials such as letters, diaries, and reports. It is a data collection technique used to obtain data through documents.

2. Data assessment;

In this stage, the data obtained from various sources are investigated and assessed using the principles of validity, authenticity, and reliability.

3. Data analysis;

The analysis and interpretation of various phenomena depicting cause-and-effect relationships and the factors studied are conducted at this stage. The data model used is qualitative before performing data analysis. The data is processed and analyzed to achieve the final goal of the study. A normative and empirical juridical method was adopted holistically, contextually, and progressively. Holistic is used because sustainable food agricultural land needs to be studied for its linkage with food availability activities and other aspects, specifically to see whether there will be weaknesses or conflicts when implemented. Meanwhile, contextually is an analysis of vital needs that underlie the existence of sustainable food agricultural land. Finally, progressives should consider current needs but still have prospective value for the future by carrying out updates.

4. Data conclusion;

In the final stage, conclusions will be given to the data interpretation and analysis results.

Existing Condition Agricultural in Cilegon City

Agricultural land in Cilegon City consists of paddy fields, dry fields/gardens, Unirrigated agricultural field/Shifting cultivation land, and uncultivated land. The 2020 Food Crops data issued by the Central Bureau of Statistics (Table 1) shows that rice fields cover 1,594.9 Ha. The largest and smallest area is in Jombang and Cilegon District.

Table 1 Area of Rice Fields in Cilegon City in 2020

No.	District	Rice field (Ha)		
		Irrigation	Rainfed	Total
1	Ciwandan	0	267,9	267,9
2	Citangkil	0	208	208
3	Pulomerak	0	25	25
4	Purwakarta	0	190	190
5	Grogol	0	157	157
6	Cilegon	0	50	50
7	Jombang	0	310,4	310,4
8	Cibeber	0	214,2	214,2
	Total	0	1.422,5	1.422,5

Source: Department of Food Security and Agriculture Cilegon City

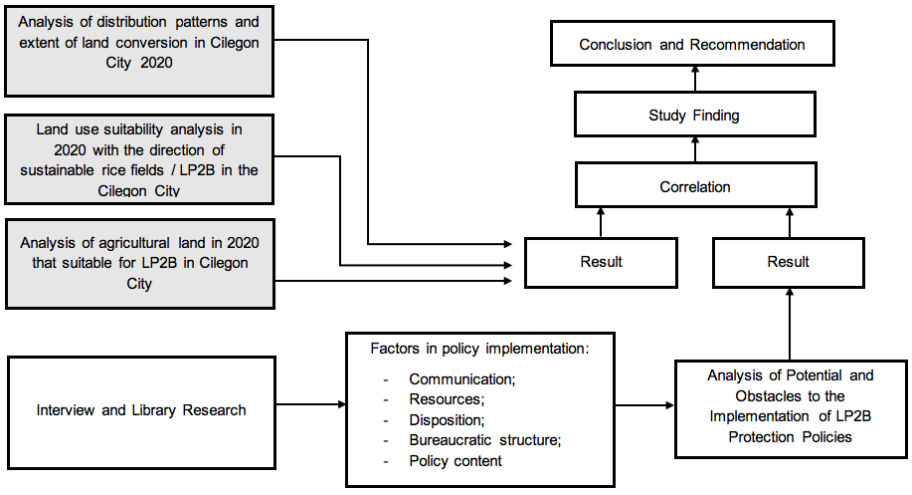

Figure 2 Research Diagram

Table 2 Area of Dry Field/Garden, Field/Huma, and Uncultivated Land in Cilegon City in 2020

No.	District	Total Area (Ha)				
		Dry Field/Garden	*Unirrigated agricultural field/ Shifting cultivation land*	Uncultivated Land	Others	Total
1	Ciwandan	707	1.417	527	0	2.651
2	Citangkil	181	0	193	142	516
3	Pulomerak	352	250	11	495	1,108
4	Purwakarta	279	0	151	27	457
5	Grogol	275	179	142	410	1,006
6	Cilegon	86	3	0	3	92
7	Jombang	4	0	0	0	4
8	Cibeber	794	**0**	**98**	172	1.064
TOTAL		**2.678**	**1.849**	**1.122**	**1.249**	**6.898**

Source: Department of Food Security and Agriculture Cilegon City

Table 3 Harvest Area and Total Rice Production in Cilegon City

No.	Kecamatan	Harvest Area (Ha)		Total Production (Ton)	
		2019	2020	2019	2020
1	Ciwandan	334	275	1.854	1.544,3
2	Citangkil	358	330	2.546	2.144,1
3	Pulomerak	40	35	149	204,3
4	Purwakarta	207	203	1.415	1.164,1
5	Grogol	214	177	1.183	994,2
6	Cilegon	84	98	540	563,9
7	Jombang	600	595	3.628	3.628,1
8	Cibeber	430	355	2.689	2.173,7
Total		2.267	2.068	14.004	12.416,7

Source: Department of Food Security and Agriculture Cilegon City

Agricultural lands are also in fields/gardens, fields/huma, and uncultivated land. Furthermore, uncultivated land is usually cultivated temporarily for more than one year but less than or equal to 2 years, including rice fields that have not been cultivated for more than 2 years. Dry Field/Garden land has the most significant area compared to Unirrigated agricultural field/Shifting cultivation and uncultivated land (Table 2). The largest and smallest Dry Field/Garden area is in the Cibeber and Jombang districts. The largest Unirrigated agricultural field/ Shifting cultivation land area is in Ciwandan District, but it is unavailable in Purwakarta and Cibeber Districts. The largest uncultivated land area is in Ciwandan District, but it is unavailable in Cilegon and Jombang Districts. Overall, the largest total land area is in Ciwandan District. Jombang District was recorded as the largest rice field area in Cilegon City.

Food crops cultivated by farmers are rice and secondary crops. Secondary crops consist of corn, soybeans, peanuts, cassava, sweet potatoes, and green beans. Rice plants are grown in fields, with the primary irrigation system relying on rainwater. In general, land can only be harvested 1-2 times a year because farmers often face the problem of water sources during the dry season. Jombang District produced the most rice throughout 2019 and 2020 because it has the largest rice field area (Table 3).

Table 4 shows that peanuts are the most dominant secondary crops. However, Table 5 shows a decrease in peanut production in 2020 due to a significant reduction in harvested area, which was 1,112 ha. The center for this production is in Pulomerak District.

Existing Condition Sustainable Food Agricultural Land in Cilegon City

Based on the Regional Spatial Plan of Cilegon City for 2020-2040, sustainable food agriculture areas function to support national food independence, resilience, and sovereignty. LP2B is a field of agricultural land determined to be protected and developed consistently to produce staple food. Based on the regional medium-term development plan of Cilegon City 2016-2026, Cibeber and Purwakarta Districts in the East Cilegon Secondary Center are developed as wetland agricultural areas and designated as Sustainable Lands. Based on Regional Regulation No. 1 of 2020 concerning the 2020-2040 Cilegon Spatial Plan, Article 28, the Sustainable Food Agricultural Land is an area of 304 Ha, which includes Cibeber, Jombang, and Purwakarta District.

FINDING

This study found the factors that determine agricultural incentives and disincentives in the three districts in Cilegon City so that these factors can be used in determining the types of incentives and disincentives influencing land owners to defend land his farm. The factors obtained are derived from the variable based on the literature review synthesis. The variable is asked to the respondents until the variables are consensus. The variable is declared as factors that determine incentives and disincentives in the three districts in Cilegon City. The agricultural land productivity, factor land conversion, obstacles in cultivation, and incentives for the protection of sustainable food agricultural land program for each district are as follow.

Table 4 Harvest Area and Total Production of Secondary Crops in Cilegon City

No.	Secondary Crops	Harvest Area (Ha)		Total Production (Ton)	
		2019	2020	2019	2020
1	Corn	262	23	934	39
2	Soybeans	0	0	0	0
3	Peanut	1.417	1.323	1.915	2.021
4	Cassava	35	20	364	264
5	Sweet Potato	21	20	225	197
6	Green Beans	38	34	36	37
Total		1.774	1.420	3.475	2.557.475

Source: Department of Food Security and Agriculture Cilegon City

Table 5 Total Production of Green Beans in Cilegon City

No.	District	Green Beans Production (Ton)	
		2019	2020
1	Ciwandan	271	115,4
2	Citangkil	195	404,2
3	Pulomerak	684,4	431,4
4	Purwkarta	207	161,9
5	Grogol	376	397,4
6	Cilegon	75	188
7	Jombang	1,1	1,1
8	Cibeber	476	216
Total		2285,5	1915,4

Source: Department of Food Security and Agriculture Cilegon City

Cibeber District

Based on the preferences of land owners obtained through the questionnaire results, the following results are obtained. Generally, farmers in the Cibeber district do not know about the Protection of Sustainable Food Agricultural Land program. There has been no information or socialization concerning this from related parties. Some descriptions of agriculture in Cibeber related to this study are as follows:

a. Cultivated plants
    1. Food crops.

Farmers generally cultivate their land to plant food crops such as rice as the primary commodity of their farming business. Paddy fields can only be planted with rice once a year because the irrigation only relies on rain. The rice planting period follows the rainy season, and the fields are planted with other food commodities such as peanuts, sweet potatoes, and corn outside the season. Peanut is one of the commodities relied upon for farming other than rice. Farmers can plant peanuts one to two times after rice harvest in one year.

    2. Horticulture

Cibeber farmers widely plant Horticultural crops, including chili, cucumber, and eggplant.

b. The dominant land conversion factor
    1. Housing Development by Real estate Companies and residential areas

As an area close to the urban center continues to grow, the need for housing increases with the increasing number of local residents and other cities. This has prompted many housing development companies to build residential areas. Some residential areas were constructed using paddy fields after purchasing the land from local communities. Residential areas that are developing in Cibeber District include Villages of Bulakan Permai, Elok Residence, Bukit Cilegon Asri, and Griya Alam Cikerai. In addition, many local people also use agricultural land to build houses, specifically when the land is close to the roads.

    2. Economy

Some farmers stated that they used to own their agricultural land. However, because of the necessities of life, lands are sold to provide basic needs of the family, such as paying for children's education, repairing/building houses, or buying vehicles. Furthermore, land is an inheritance right for numerous persons and is later sold such that the proceeds are allocated to the owner of the inheritance right.

    3. Low productivity

Generally, paddy fields in Cibeber District are rainfed lands that rely on rainwater to irrigate their land. As a result, farmers can only plant rice once a year. Land productivity also decreases due to uncontrolled irrigation. This resulted in the low income of farmers, preventing them from fulfilling their daily needs, and they were forced to sell their land. Based on data from the Food and Agriculture Security Service of Cilegon City, the productivity of paddy fields in 2020 was 6 tons/ha. However, the conditions in the field indicate that the land cultivated is generally less than 0.5 ha. Hence, the farming activities carried out are inefficient.

    4. Social culture

There is a view in the community that agricultural business is not profitable or cannot provide sufficient income to meet the needs of a decent life. The business is also seen as a heavy job, high risk, and has no prestige. Therefore, those involved in business/work as farmers are the only people with no choice but to work in other fields. Farmers in Cibeber are over 50 years old, and very few young people are willing to work as farmers. This results in a lack of labor in farming; hence, the land is not used optimally and generates profits. This unmanaged land is then turned into settlements, buildings, or sold.

c. Obstacles in cultivation
    1. There is no water source for irrigation other than rain-fed
    2. Availability of fertilizers and seeds for rice plants
    3. Fertilization of the land is not as recommended
    4. Subsistence farming only on rice
    5. The age of the farmer is relatively old
d. Expected incentives to maintain farmland
    1. Provision of water for irrigation so you can harvest rice with good results at least two times
    2. Provision of fertilizers and seeds as needed
    3. Agricultural machines in the form of hand tractors
    4. Provision of water pumping equipment for irrigation at the farmer group level (3-inch pumping machine, suction, and irrigation hose); a large well at the Customs exit.

5. Provision of water jet pumps for horticultural land
6. Operational assistance for the management of pumping machines managed by the water user group
7. Marketing assistance, specifically for horticultural (melon) products to enter the modern market at high prices.

Jombang District

Based on the preferences of land owners obtained through the questionnaire results, the following results are obtained. Generally, farmers in the Jombang district do not know about the Protection of Sustainable Food Agricultural Land program. There has been no information or socialization concerning this from related parties. Some descriptions of agriculture in Jombang related to this study are as follows:

a. Cultivated plants
   1. Food crops.

Farmers generally cultivate their land to plant food crops such as rice as the primary commodity of their farming business. Paddy fields can only be planted with rice once to twice a year because the irrigation is not only on rain but also from a small river that flows to the paddy fields using a jet pump. Other food crops are planted by farmers in Jombang District, such as peanuts, sweet potatoes, and corn.

   2. Horticulture

Jombang farmers widely plant Horticultural crops, including yard-long bean, chili, cucumber, and eggplant.

b. The dominant land conversion factor
   1. Housing Development by Real estate Companies and residential areas

As an area close to the urban center continues to grow, the need for housing increases with the increasing number of local residents and other cities. This has prompted many housing development companies to build residential areas. Some residential areas were constructed using paddy fields after purchasing the land from local communities. Residential areas that are developing in Jombang District include Gedong Dalem Village. In addition, many local people also use agricultural land to build houses, specifically when the land is close to the roads.

   2. Economy

Some farmers stated that they used to own their agricultural land. However, because of the necessities of life, lands are sold to provide basic needs of the family, such as paying for children's education, repairing/building houses, or buying vehicles. Furthermore, land is an inheritance right for numerous persons and is later sold such that the proceeds are allocated to the owner of the inheritance right.

   3. Low productivity

Generally, paddy fields in Jombang District are rainfed lands that rely on rainwater to irrigate their land. As a result, farmers can only plant rice once a year. Land productivity also decreases due to uncontrolled irrigation. This resulted in the low income of farmers, preventing them from fulfilling their daily needs, and they were forced to sell their land. Based on data from the Food and Agriculture Security Service of Cilegon City, the productivity of paddy fields in 2020 was 6 tons/ha. However, the conditions in the field indicate that the land cultivated is generally less than 0.5 ha. Hence, the farming activities carried out are inefficient.

   4. Social culture

There is a view in the community that agricultural business is not profitable or cannot provide sufficient income to meet the needs of a decent life. The business is also seen as a heavy job, high risk, and has no prestige. Therefore, those involved in business/work as farmers are the only people with no choice but to work in other fields. Farmers in Jombang District are over 50 years old, and very few young people are willing to work as farmers. This results in a lack of labor in farming; hence, the land is not used optimally and generates profits. This unmanaged land is then turned into settlements, buildings, or sold.

c. Obstacles in cultivation
   1. There is no water source for irrigation other than rain-fed
   2. Availability of fertilizers and seeds for rice plants
   3. Fertilization of the land is not as recommended
   4. Subsistence farming only on rice
d. Expected incentives to maintain farmland
   1. Provision of water pumping equipment for irrigation at the farmer group level (3-inch pumping machine, suction, and irrigation hose); a large well at the Customs exit.

2. Operational assistance for the management of pumping machines managed by the water user group
3. Provision of fertilizers and seeds as needed

Purwakarta District

Based on the preferences of land owners obtained through the questionnaire results, the following results are obtained. Generally, farmers in the Purwakarta district do not know about the Protection of Sustainable Food Agricultural Land program. There has been no information or socialization concerning this from related parties. Some descriptions of agriculture in Purwakarta related to this study are as follows:

a. Cultivated plants
   1. Food crops.

Farmers generally cultivate their land to plant food crops such as rice as the primary commodity of their farming business. Paddy fields can only be planted with rice once to twice a year because the irrigation only relies on rain. Other food crops are grown by farmers in Jombang District, such as peanuts and sweet potatoes.

   2. Horticulture

Cibeber farmers widely plant Horticultural crops, including yard-long bean, chili, cucumber, and eggplant.

b. The dominant land conversion factor
   1. Housing Development by Real estate Companies and residential areas

As an area close to the urban center continues to grow, the need for housing increases with the increasing number of local residents and other cities. This has prompted many housing development companies to build residential areas. Some residential areas were built using paddy fields after purchasing the land from local communities. In addition, many local people also use agricultural land to build houses, specifically when the land is close to the roads.

   2. Economy

Some farmers stated that they used to own their agricultural land. However, because of the necessities of life, lands are sold to provide basic needs of the family, such as paying for children's education, repairing/building houses, or buying vehicles. Furthermore, land is an inheritance right for numerous persons and is later sold such that the proceeds are allocated to the owner of the inheritance right.

   3. Low productivity

Generally, paddy fields in Purwakarta District are rainfed lands that rely on rainwater to irrigate their land. As a result, farmers can only plant rice once a year. Land productivity also decreases due to uncontrolled irrigation. This resulted in the low income of farmers, preventing them from fulfilling their daily needs, and they were forced to sell their land. Based on data from the Food and Agriculture Security Service of Cilegon City, the productivity of paddy fields in 2020 was 6 tons/ha. However, the conditions in the field indicate that the land cultivated is generally less than 0.5 ha. Hence, the farming activities carried out are inefficient.

   4. Social culture

There is a view in the community that agricultural business is not profitable or cannot provide sufficient income to meet the needs of a decent life. The business is also seen as a heavy job, high risk, and has no prestige. Therefore, those involved in business/work as farmers are the only people with no choice but to work in other fields. Farmers in Purwakarta District are over 50 years old, and very few young people are willing to work as farmers. This results in a lack of labor in farming; hence, the land is not used optimally and generates profits. This unmanaged land is then turned into settlements, buildings, or sold.

c. Obstacles in cultivation
   1. There is no water source for irrigation other than rain-fed
   2. Availability of fertilizers and seeds for rice plants
   3. Fertilization of the land is not as recommended
   4. Subsistence farming only on rice
   5. The age of the farmer is relatively old
d. Expected incentives to maintain farmland
   1. Provision of water for irrigation so you can harvest rice with good results at least two times
   2. Provision of water jet pumps for horticultural land
   3. Operational assistance for the management of pumping machines managed by the water user group
   4. Provision of fertilizers and seeds as needed
   5. Marketing assistance, specifically for horticultural (melon) products to enter

the modern market at high prices.

Disincentive

To realize the policies and strategies adopted above, it is necessary to develop regulatory instruments as a more detailed operational basis in the form of disincentives. Based on the potential and problems that exist in the agricultural sector of food land (paddy rice) in Cilegon City, the application of disincentives for three districts that can be carried out are as follows:

1. The application of high taxes for the Protection of Sustainable Food Agricultural land conversions
2. Tightening of building permits for the use of the conversion land
3. The imposition of compensation for land conversion
4. Restrictions on facilities and infrastructure on the use of converted land

CONCLUSION

This study examines the determinant of agricultural land conversion, the problems in productivity, incentive, and disincentive for protecting sustainable food agricultural land in Cibeber, Jombang, and Purwakarta Districts. The result showed that economic and non-economic factors determine agricultural land conversions, such as farmers' family necessities of life, housing development, and low productivity of agricultural land. Furthermore, some obstacles in cultivation include rain-fed and groundwater sources for irrigation, availability of fertilizers and seeds for rice plants, fertilization of the land not as recommended, subsistence farming only on rice, and the farmer's age is relatively old.

Based on conditions in each district, the authors conclude some incentives can be delivered by providing facilities and infrastructure to support farmland, such as irrigation, water jet pump, fertilizers and seeds, and marketing assistance. However, some disincentives should be applied, such as high taxes for the conversion of Sustainable Food Agricultural land functions, Tightening building permits for the use of transferred land, Imposition of compensation for land conversion, and restriction facilities and infrastructure on the use of converted land.

This study provides recommendations to protect sustainable food agricultural land. Furthermore, it promotes detailed agrarian reform and equalizes perceptions among Regional Apparatus Organizations. It also disseminates information to the community and updates the mapping of water sources. Finally, it promotes the issuance of local government law of Protection of Sustainable Food Agricultural land.

REFERENCES

Creswell, J. W. 2016. Research design: pendekatan metode kualitatif, kuantitatif, dan campuran. *Yogyakarta: Pustaka Pelajar*, *5*.

Digdowiseiso, K., Sugiyanto, E., and Zainul, D. 2018. Implementation of irrigation policy in the decentralized government: A case study of west Java, Indonesia. *Journal of Environmental Management and Tourism*, *9*(3 (27)), 411-422.

Garnett, T. 2014. Three perspectives on sustainable food security: efficiency, demand restraint, food system transformation. What role for life cycle assessment?. *Journal of Cleaner Production*, *73*, 10-18.

Karim, I., and Ariastita, P. G. 2017. Penentuan Nilai Insentif dan Disinsentif Pada Pajak Bumi dan Bangunan Sebagai Instrumen Pengendalian Alih Fungsi Lahan Pertanian di Sidoarjo. *Jurnal Sains dan Seni ITS*, *5*(2). *Jurnal Sains dan Seni ITS*, *5*(2).

Lenaerts, B., Collard, B. C., and Demont, M. 2019. Improving global food security through accelerated plant breeding. *Plant Science*, *287*, 110207.

Mbunda, R. 2016. The developmental state and food sovereignty in Tanzania. *Agrarian South: Journal of Political Economy*, *5*(2-3), 265-291.

McMichael, P. 2015. The land question in the food sovereignty project. *Globalizations*, *12*(4), 434-451.

Miller, R. M., Chan, C. D., and Farmer, L. B. 2018. Interpretative phenomenological analysis: A contemporary qualitative approach. *Counselor Education and Supervision*, *57*(4), 240-254.

Nugara, N., and Rudiarto, I 2017. Kajian Identifikasi dan Implementasi Kebijakan Perlindungan LP2B di Kabupaten Pekalongan. *Jurnal Pembangunan Wilayah dan Kota*, *13*(2), 229-242.

Nuraeni, S., Noor, T. I., and Sudradjat, D. 2018. Respon Petani terhadap Kebijakan Lahan Pertanian Pangan Berkelanjutan di

Kelurahan Kersanagara, Kecamatan Cibeureum, Kota Tasikmalaya, Provinsi Jawa Barat. *Jurnal Ilmiah Mahasiswa Agroinfo Galuh*, *4*(3), 848-855.

Pitaloka, E. D. A. 2020. Kebijakan Perlindungan Lahan Pertanian Pangan Berkelanjutan Dalam Dimensi Politik Hukum Penataan Ruang. *Jurnal IUS Kajian Hukum dan Keadilan*, *8*(1), 49-78.

Prayitno, G., Dinanti, D., Hidayana, I. I., and Nugraha, A. T. 2021. Place attachment and agricultural land conversion for sustainable agriculture in Indonesia. *Heliyon*, *7*(7), e07546.

Rondhi, M., Pratiwi, P. A., Handini, V. T., Sunartomo, A. F., and Budiman, S. A. 2019. Agricultural Land Conversion and Food Policy in Indonesia: Historical Linkages, Current Challenges, and Future Directions. In *Current Trends in Landscape Research* (pp. 631-664). Springer, Cham.

Santeramo, F. G. 2015. On the composite indicators for food security: Decisions matter!. *Food Reviews International*, *31*(1), 63-73.

Syuaib, M. F. 2016. Sustainable agriculture in Indonesia: Facts and challenges to keep growing in harmony with environment. *Agricultural Engineering International: CIGR Journal*, *18*(2), 170-184.

Ustaoglu, E., and Williams, B. 2017. Determinants of urban expansion and agricultural land conversion in 25 EU countries. *Environmental management*, *60*(4), 717-746.

Wang, L., and Shen, J. 2017. The challenge of spatial plan coordination in urban China: The case of Suzhou city. *Urban Policy and research*, *35*(2), 180-198.

Wicaksono, A. 2020. Implementasi Program Lahan Pertanian Pangan Berkelanjutan (LP2B) Kabupaten Karawang: Studi Kasus Penetapan Luas Baku Sawah. *Jejaring Administrasi Publik*, *12*(1), 89-107.

Wittman, H., and Blesh, J. 2017. Food Sovereignty and F ome Z ero: Connecting Public Food Procurement Programmes to Sustainable Rural Development in B razil. *Journal of Agrarian Change*, *17*(1), 81-105.

Zakaria, A. K., and Rachman, B. 2013. Implementasi sosialisasi insentif ekonomi dalam pelaksanaan program Perlindungan Lahan Pertanian Pangan Berkelanjutan (PLP2B). In *Forum Penelitian Agro Ekonomi* Vol. 31, No. 2, pp. 137-149.