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ANALYSIS OF LAND USE ALIGNMENT WITH SPATIAL PATTERN PLAN IN BATANG DISTRICT, CENTRAL JAVA

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ABSTRACT

This study analyzes the alignment of land use with the spatial planning pattern of the Regional Spatial Planning (RTRW) in Batang Regency, Central Java Province. The research utilizes the land use map of Batang Regency from 2021 and the Batang Regency spatial planning map for 2019-2039. The largest land use in Batang Regency is paddy fields, covering an area of 17,483.57 hectares or 20.39% of the total land area. The alignment analysis results reveal that 47,465.63 hectares or 55.36% of land use in Batang is consistent with the spatial planning pattern, 33,814.25 hectares or 39.44% is potentially consistent, and 4,462.25 hectares or 5.20% is not consistent with the spatial planning pattern or its designated purpose. The findings highlight the need for targeted policy interventions to enhance land use conformity with the spatial planning framework to promote sustainable development in Batang Regency.

KEYWORDS *Harmony, Alignment, Land Use, Spatial Pattern*

INTRODUCTION

Land use change is inevitable along with the increasing population growth in an area. In accordance with the statement of Zalmita et al. (2020) that land use patterns in an area are related to population growth and activities. This condition will affect the increase in land use change. Land use tends to change from agricultural *land* to built-up land that has a higher economic value or land *rent*.

According to Sitorus (2017), land use is a continuous effort made by humans on existing land resources to meet their needs, so it is dynamic in line with regional development and people's lives and cultures. This change occurs due to the increasing needs of the population for land use (Kusumaningrat et al., 2017).

Batang Regency is one of the administrative regions located in Central Java Province. Batang Regency has a fairly good economic growth. Based on data from the Central Statistics Agency (BPS), the economic growth rate of Batang Regency was quite stable at around 5% in the 2015-2019 period.

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The economic growth rate of Batang Regency is expected to continue to increase with the construction of the National Strategic Project (PSN) in almost the same time, namely the Batang PLTU and the Batang Integrated Industrial Zone. The development of various projects and infrastructure in addition to having a positive impact in the form of increased economic growth in Batang Regency also has the potential to have an impact on increasing the rate of land use change. According to (Rustiadi 2001), the increase in activities around urban areas is one of the factors causing the conversion of agricultural land into non-agricultural land. This conversion has the potential to cause several problems related to the efficiency of resource allocation and distribution from an economic point of view, equitable distribution of welfare and control of resources, as well as a decrease in the quality and damage to the environment.

The dynamics of land use change that occur, especially in the context of changes in agricultural land to residential land and protected areas to cultivated land, require spatial monitoring and control to see how the plan matches the situation on the ground. The aim is to harmonize the situation on the ground with the initial plan that has been prepared. Land use changes that occur in an area sometimes not in accordance with the spatial plans that have been made and determined by the local government, such as those contained in the Detailed Spatial Plan and the Regional Spatial Plan (RTRW) (Alwan, 2020).

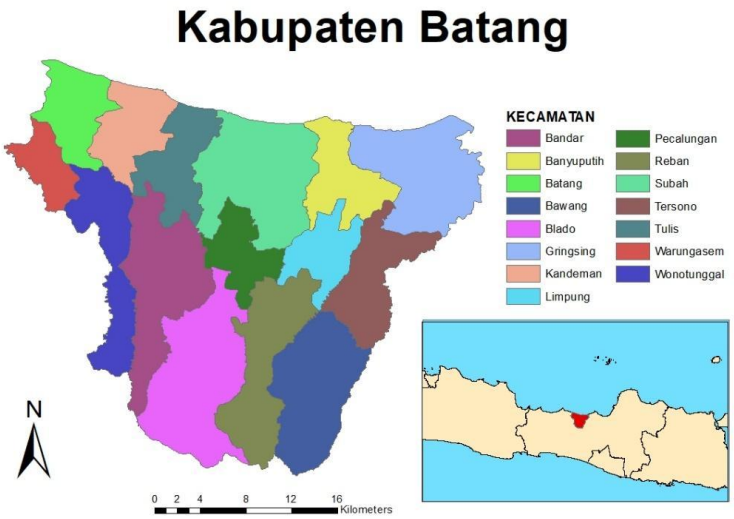
The Batang Regency RT/RW, which has been established as a guideline in spatial management, is expected to be an effective tool in regulating land use in accordance with planning. However, its implementation in the field often faces various obstacles that cause discrepancies between the plan and its implementation. Therefore, it is necessary to conduct research to evaluate land use utilization against the RTRW spatial pattern in Batang Regency.

This research aims to analyze the alignment of land use with the spatial pattern of the RTRW in Batang Regency, Central Java. Through a spatial analysis and policy evaluation approach, this research will identify areas of deviation from the spatial plan. The results of this research are expected to provide practical and implementable policy recommendations to improve the alignment of land use with the RTRW, and support sustainable and coordinated regional development.

RESEARCH METHOD

The research was conducted in Batang Regency, which is astronomically located at 6° 51' 46" to 7° 11' 47" South latitude and between 109° 40' 19" to 110° 03' 06" East longitude on the north coast of Central Java. South latitude and between 109° 40' 19" to 110° 03' 06" East longitude on the north coast of Central Java. The materials used in this research are the Batang Regency land cover map in 2021, the Batang Regency Spatial Plan map 2019-2039 and the Batang Regency data in

figures in 2021. The tool used is a computer device equipped with ArcGIS 10.5 *software*. The spatial data used in this research was sourced from the Batang Regency Planning, Research and Development Agency (Bapelitbang).



Location of Batang Regency, Central Java

The analysis technique applied in this research uses the *overlay* method using ArcGIS 10.5 *software*. The existing land use map in 2021 was *overlaid* with the 2019-2039 spatial pattern map of Batang Regency. The *overlay* results were then grouped based on the alignment matrix of land use types with spatial patterns, which resulted in a map of the alignment of Indramayu Regency's spatial utilization. The evaluation results are categorized into aligned, potentially aligned, and not aligned. The matrix of alignment of land use types with spatial patterns is presented in Table 1.

Table 1. Alignment Matrix

Space Pattern	Land Cover 2021												
	CGA	HTL	HPTS	HPTT	IDS	PTA	PLB	ESC	FMD	SWH	SNG	TMB	TGL
KCA	S	S	PS	PS	T	PS	T	PS	T	T	PS	PS	PS
KEM	S	S	PS	PS	T	PS	T	PS	T	T	PS	PS	PS
KHT	PS	PS	PS	PS	T	PS	T	PS	T	PS	PS	PS	PS
KHL	S	S	PS	PS	T	PS	T	PS	T	T	PS	PS	PS
KHR	PS	PS	PS	PS	T	PS	T	PS	T	PS	PS	PS	PS
KPTL	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS

Space Pattern	Land Cover 2021												
	CGA	HTL	HPTS	HPTT	IDS	PTA	PLB	ESC	FMD	SWH	SNG	TMB	TGL
KPI	PS	PS	PS	PS	S	PS	T	PS	T	PS	PS	PS	PS
KPB	PS	PS	PS	PS	T	PS	T	S	T	PS	PS	PS	PS
KPDS	PS	PS	PS	PS	T	PS	T	PS	S	PS	PS	PS	PS
KPKT	PS	PS	PS	PS	T	PS	T	PS	S	PS	PS	PS	PS
KHPTS	PS	PS	S	PS	T	PS	T	PS	T	PS	PS	PS	PS
KHPTT	PS	PS	PS	S	T	PS	T	PS	T	PS	PS	PS	PS
KIDS	PS	PS	PS	PS	S	PS	PS	PS	PS	PS	PS	PS	PS
KRBGT	PS	PS	T	T	T	T	T	T	T	T	T	T	T
IDCARD	PS	PS	PS	PS	T	PS	T	PS	T	S	PS	PS	PS
SP	PS	PS	T	T	T	S	T	T	T	T	PS	PS	T
SS	PS	PS	T	T	T	PS	T	T	T	T	S	PS	T
SNG	PS	PS	T	T	T	PS	T	T	T	T	S	PS	T

Description: Land Cover 2021, CGA: Nature Reserve, HTL: Protection Forest, HPTS: Limited Production Forest, HPTT: Permanent Production Forest, IDS: Industry, PTA: Beach, PLB: Port, PKB: Plantation, FMD: Settlement, SWH: Rice Field, SNG: River, TMB: Pond, TGL: Farm

Space Pattern, KCA: Kaw Nature Reserve, KEM: Mangrove Ecosystem, KHT: Horticultural Area, KHL: Forest Reserve, KHR: Community Forest, KPTL: Power Plant Kaw, KPI: Fishery Area, KPB: Plantation Area, KPDS: Rural Settlement Kaw, KPKT: Urban Settlement, KHPTS: Limited Production Forest, KHPTT: Permanent Production Forest, KIDS: Industrial Kaw, KRBGT: Land Movement Disaster Prone Kaw, KTP: Food Crops, SP: Coastal Boundary, SS: Sempadan Sungai, SNG: River

RESULT AND DISCUSSION

Existing Land Use of Batang Regency in 2021

Based on the results of the analysis of the Batang Regency land use map in 2021, there are 13 types of land use in Batang Regency, namely: Beach, Nature

Reserve, Protected Forest, Limited Production Forest, Permanent Production Forest, Industry, Port, Settlement, Rice Field, River, Pond, and Farm.

The largest type of land cover in Batang Regency in 2021 is Tegalan with an area of 33,340.35 Ha or 38.88% of the entire area of Batang Regency. Based on its distribution, land use in the form of Tegalan is spread almost evenly throughout the Batang Regency area except in the southernmost area.

The second largest land use is Rice Fields with an area of 17,483.57 Ha or 20.39% of the total area of Batang Regency. Similar to Tegalan, Rice Fields land use spreads almost evenly throughout Batang Regency except in the southernmost part which is a mountainous or highland area.

The next largest land uses are settlements and limited production forests with a percentage area of 9,691.12 hectares or 11.30% and 9,450.83 hectares or 11.02% respectively. The area of each land cover in Batang Regency in 2021 is presented in Table 2.

Table 2. Existing Land Use Area of Batang Regency in 2021

No.	Land Cover Type	Area (Ha)	Percentage
1	Beach	29,52	0,03%
2	Nature Reserve	92,95	0,11%
3	Protection Forest	2.935,62	3,42%
4	Limited Production Forest	9.450,83	11,02%
5	Permanent Production Forest	5.668,33	6,61%
6	Industry	122,08	0,14%
7	Port	1,56	0,002%
8	Plantation	5.377,52	6,27%
9	Settlements	9.691,12	11,30%
10	Sawah	17.483,57	20,39%
11	River	599,26	0,70%
12	Pond	951,55	1,11%
13	Moor	33.340,35	38,88%
	Total	**85.744,25**	**100,00%**

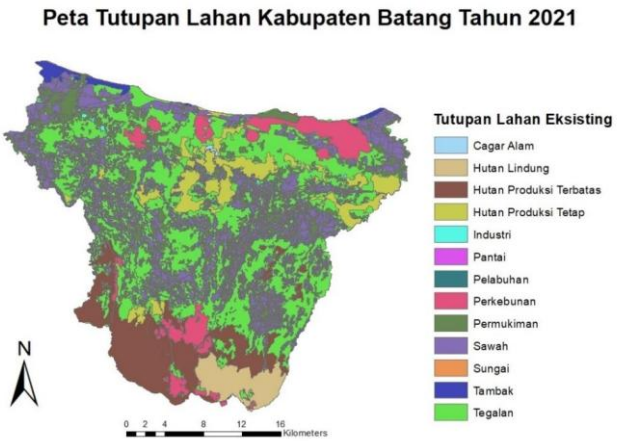


Figure 2. Land Cover Map of Batang Regency in 2021

Spatial Pattern of Batang Regency RTRW 2019 - 2039

The spatial pattern of Batang Regency is stipulated in Batang Regency Regional Regulation Number 13 of 2019 concerning the Regional Spatial Plan of Batang Regency 2019-2039. The preparation of this regional regulation aims to control and direct development, especially with regard to land use in Batang Regency.

The spatial pattern in Batang Regency consists of protected areas and cultivated areas. Protected areas consist of Nature Reserve Areas, Mangrove Ecosystems, Protected Forests, Land Movement Prone Areas, Coastal Boundaries, River Boundaries, and Rivers. While cultivated areas consist of Horticultural Areas, Permanent Production Forest Areas, Community Forests, Power Plants, Fisheries, Plantations, Rural Settlements, Urban Settlements, Limited Production Forests, Industrial Allotments and Food Crops. The 2019-2039 Batang Regency Spatial Pattern Map is presented in Figure 3.

Table 3. Land Use Alignment of Batang Regency in 2021

No.	Alignment	Area (Ha)	Percentage
1	Aligned	47.465,63	55,36%
2	Potentially Aligned	33.814,25	39,44%
3	Not aligned	4.462,25	5,20%
	Total	**85.742,13**	**100,00%**

Most of the land use in Batang District, totaling 47,465.63 Ha or 55.36%, is in harmony with the Spatial Plan. This harmonized status is dominated by the use of paddy fields located in the Food Crop Area covering an area of 16,398.39 Ha or 19.13% of the entire Batang District area.

Furthermore, 33,814.25 Ha or 39.44% of land use falls into the potential alignment category. And 4,462.25 hectares or only 5.20% fall into the misaligned category. Non-aligned land use is dominated by land use in the Land Movement Hazard Area with a total area of 3,993.04 Ha or 4.66%. The detailed area of land use alignment of Batang Regency in 2021 is presented in Table 4.

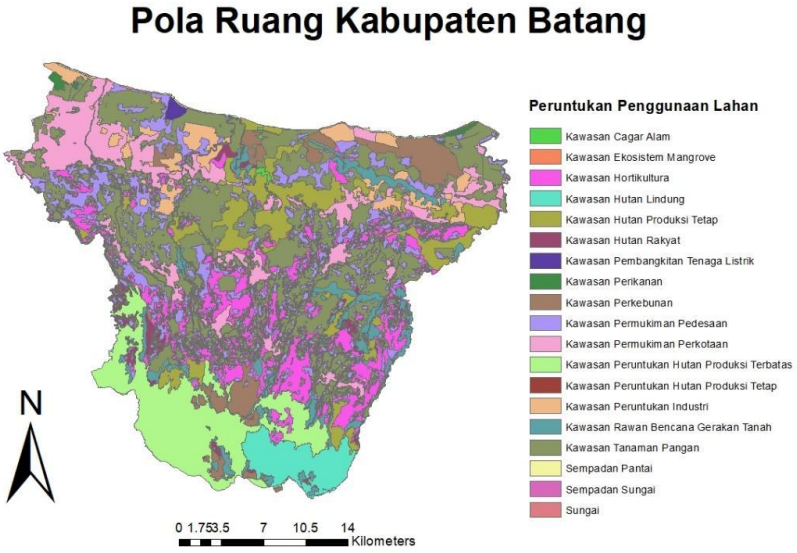


Figure 3. Spatial Pattern Map of Batang Regency 2019 - 2039

Analysis of Land Use Alignment with the Spatial Pattern of Batang Regency

Based on the results of overlaying the Batang Regency Land Use Map in 2021 with the Batang Regency Spatial Pattern Map, the results of the Batang Regency land use alignment area are presented in Table 3 below.

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Table 4. Land Use Alignment of Batang Regency in 2021

SPACE POLE	LAND COVER 2021 (Ha)													
	CGA	HTL	HPTS	HPTT	IDS	PTA	PLB	ESC	FMD	SWH	SNG	TMB	TGL	Total
KCA	92,95	-	-	-	-	-	-	-	-	0,01	10,69	-	-	103,65
KEM	-	-	-	-	-	25,22	-	0,93	0,03	-	-	52,18	42,96	121,33
KHT	-	-	-	-	-	-	-	0,07	4,46	0,29	-	-	10.802,34	10.807,16
KHL	-	2.933,94	-	-	-	-	-	-	-	0,30	3,51	-	-	2.937,75
KHR	-	1,68	-	-	-	-	-	0,00	-	0,52	-	-	1.131,35	1.133,56
KPTL	-	-	-	-	-	-	-	-	-	-	-	-	207,71	207,71
KPI	-	-	-	-	-	-	-	-	-	-	-	283,39	0,70	284,09
KPB	-	-	-	-	-	-	-	3.942,15	1,92	-	-	-	64,88	4.008,95
KPDS	-	-	-	-	0,07	1,22	-	46,63	5.190,49	144,32	-	112,01	3.380,63	8.875,37
KPKT	-	-	-	-	2,65		1,56	41,92	4.019,12	584,82	-	80,93	3.626,86	8.357,85
KHPTS	-	-	8.630,46	-	-	-	-	-	-	2,14	73,46	-	20,23	8.726,30
KHPTT	-	-	820,36	5.668,33	-	-	-	-	-	100,21	43,98	-	1,67	6.634,56
KIDS	-	-	-	-	119,11	-	-	702,83	395,26	14,31	-	288,83	1.788,81	3.309,15
KRBGT	-	-	-	-	0,25	-	-	590,93	72,49	236,12	-	-	3.093,25	3.993,04
ID CARD	-	-	-	-	-	-	-	11,35	7,34	16.398,39	-	88,15	8.768,83	25.274,06
SP	-	-	-	-	-	3,08	-	31,09	-	-	-	41,15	57,85	133,17
SS	-	-	-	-	-	-	-	9,62	0,00	0,10	-	4,83	352,20	366,75
SNG	-	-	-	-	-	-	-	-	-	-	467,61	0,09	-	467,71
Total	92,95	2.935,62	9.450,83	5.668,33	122,08	29,52	1,56	5.377,52	9.691,12	17.481,53	599,26	951,55	33.340,26	85.742,13

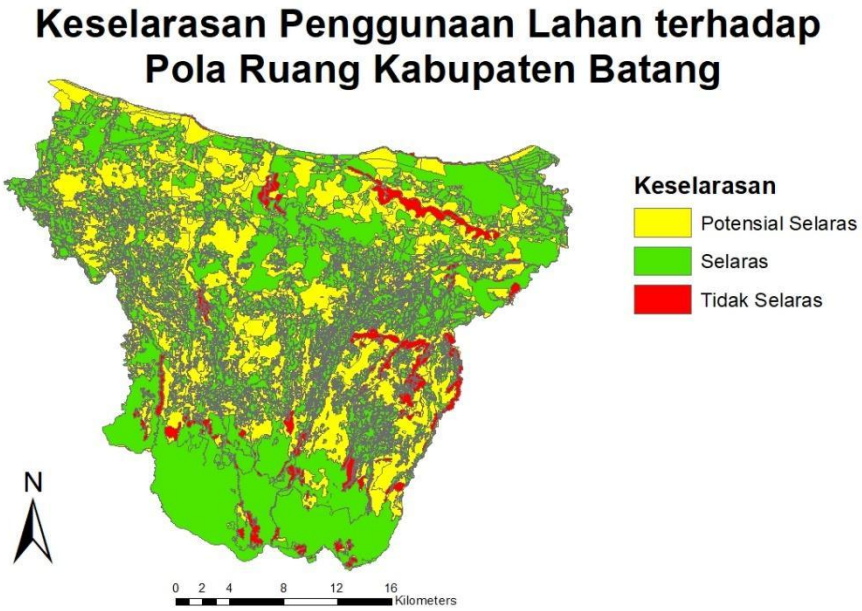

Figure 4. Land Use Alignment Map of Batang Regency in 2021

CONCLUSION

Land use in Batang Regency in 2021 is mostly categorized as harmonious and potentially harmonious. Only a small portion is not aligned with the spatial pattern plan. Land use as rice fields is the largest harmonized land use. As for land use that is not harmonized, most of it is due to being in the Land Movement Disaster Prone Area.

REFERENCES

[BPS] Badan Pusat Statistik Kabupaten Batang. 2022. Kabupaten Batang dalam Angka. Batang (ID): BPS Kabupaten Batang.

[Pemkab Batang] Pemerintah Kabupaten Batang. 2019. Peraturan Daerah Kabupaten Tangerang

Barus B, Panuju DR, Iman LS, Trisasongko BH, Gandasasmita K, Kusumo R. 2012. Pemetaan Potensi Konversi Lahan Sawah dalam Kaitan Lahan Pertanian Berkelanjutan dengan Analisis Spasial. Dalam: Ariyanto DP, Dewi WS, Suwardi, (Editor). Tanah untuk Kehidupan yang Berkualitas. Seminar dan Kongres Nasional X Himpunan Ilmu Tanah Indonesia (HITI); Surakarta, Indonesia, 6 – 8 Desember 2011. Surakarta (ID): Jurusan Ilmu Tanah Fakultas Pertanian UNS. Hal 554 – 561.

Briassoulis H. 2019. The Web Book of Regional Science Sponsored by Analysis of Land Use Change: Theoretical and Modeling Approaches By Helen Briassoulis. :248.

Dani ET, Sitorus SRP, Munibah K. 2017. Analisis Penggunaan Lahan dan arahan Pengendalian Pemanfaatan Ruang di Kabupaten Bogor. Jurnal Tata Loka. 19(1): 40-52.

Daulay AR, Intan E, Putri K, Barus B, Noorachmat BP. 2016. Analisis Faktor Penyebab Alih Fungsi Lahan Sawah Menjadi Sawit Di Kabupaten Tanjung Jabung Timur. Anal. Kebijak. Pertan. 14(1):1–15.

Eko T, Rahayu S. 2012. Perubahan Penggunaan Lahan dan Kesesuaiannya dengan RDTR di Wilayah Peri Urban (Studi Kasus Kecamatan Mlati). Jurnal Pembangunan Wilayah dan Kota. 8 (4): 330-340.

Ekosafitri KH, Rustiadi E, Yulianda F. 2017. Pengembangan Wilayah Pesisir Pantai Utara Jawa Tengah Berdasarkan Infrastruktur Daerah: Studi Kasus Kabupaten Jepara. J. Reg. Rural Dev. Plan. 1(2):145. doi:10.29244/jp2wd.2017.1.2.145-157.

Handayani AD, Yuliastuti N. 2014. Identifikasi Ketersediaan dan Kualitas Sarana Prasarana Lingkungan di Urban Fringe Area Kelurahan Pudakpayung. Jurnal Wilayah dan Lingkungan. 2 (3): 197-208.

I Gusti Ngurah Santosa Gede menaka adnyana dan i ketut kartha dinata. 2010. Dampak Alih Fungsi Lahan Pertanian Terhadap Ketahanan Pangan Beras. Pros. Semin. Nas. Budid. Pertan. 2005(Bps 2005):52–61.

Khaerani R, Sitorus SRP, Rusdiana O. 2018. Analisis Penyimpangan Penggunaan Lahan berdasarkan Rencana Tata Ruang Kabupaten Sumedang. Jurnal Tata Loka. 20 (4): 399-409.

Nomor 13 tahun 2019 tentang Rencana Tata Ruang Wilayah Kabupaten Tangerang tahun 2019-2039. Batang (ID): Pemkab Batang.

Putra YP, Dewi FR. 2016. Analisis Portofolio Sumber Dana PT Bank X Sebagai Instrumen Optimalisasi Budgeting dan Pengambilan Strategi. J. Manaj. dan Organ. 1(1):1.doi:10.29244/jmo.v1i1.14139.

Rustiadi E, Saefulhakim S, Panuju D. 2009. Perencanaan dan Pengembangan Wilayah.

Rustiadi E. 2001. Alih Fungsi Lahan dalam Perspektif Lingkungan Perdesaan. Lokakarya Penyusunann Kebijak. dan Strateg. Pengelolaan Lingkung. Kaw. Perdesaan.(November).

Rustiadi. 2011. Perencanaan dan Pengembangan Wilayah - Ernan Rustiadi - Google Buku. Yayasan Pustaka Obor.:546.

Ruswandi A, Rustiadi E, Mudikdjo K. 2007. Konversi Lahan Pertanian dan Dinamika Perubahan Penggunaan Lahan di Kawasan Bandung Utara. Jurnal Tanah dan Lingkungan. 9(2): 63 – 69.

Saliem HP, Ariani M. 2016. Ketahanan Pangan, Konsep, Pengukuran dan Strategi. Forum Penelit. Agro Ekon. 20(1):12.doi:10.21082/fae.v20n1.2002.12-24.

Saragih H. 2009. Penyediaan Lahan untuk Kedaulatan Pangan dan Kemandirian Petani. Dalam: Tarigan SD, Barus B, Panuju DR, Trisasongko BH, Nugroho B, editor. Prosiding Semiloka Nasional: Strategi Penanganan Krisis Sumberdaya Lahan untuk Mendukung Kedaulatan Pangan dan Energi; Bogor, Indonesia, 22 – 23 Desember 2008. Bogor (ID): Departemen Ilmu Tanah dan Sumberdaya Lahan Fakultas Pertanian Institut Pertanian Bogor. Hal. 52 – 63.

Sitorus SR. 2017. Perencanaan Penggunaan Lahan. Ed ke-1 Maromon RY, Elviandri Y, Waldi RD, editor. Bogor: IPB Pres.

Sitorus SRP, Leonataris C, Panuju DR. 2012. Analisis Pola Perubahan Penggunaan Lahan dan Perkembangan Wilayah di Kota Bekasi, Provinsi Jawa Barat. Jurnal Tanah dan Lingkungan, 14 (1): 21 – 28.

Sitorus SRP, Leonataris C, Panuju DR. 2012. Analisis Pola Perubahan Penggunaan Lahan Dan Perkembangan Wilayah Di Kota Bekasi, Provinsi Jawa Barat. J. Ilmu Tanah dan Lingkung. 14(1): 21.doi:10.29244/jitl.14.1.21-28.

Sitorus SRP, Putri R, Panuju DR. 2009. Analisis Konversi Lahan Pertanian di Kabupaten Tangerang. Jurnal tanah dan Lingkungan 11(2): 41-48. Bogor