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Analysis Of Space Structure As The Impact Of Urbanization (Case Study: Tembalang District, Semarang City)

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Abstract

The growth of a region that is quite high often occurs in areas that have a special role, be it the central region of the economy, education and government. That is one of the causes of the formation of new areas or commonly called new urban areas. During the formation of new urban areas there is an urban process called urbanization. This has resulted in changes in land use from non-build up area to build up area. The amount of building build-up area that increases will affect the determination of spatial structure that has been predetermined by the local government. For this reason, an analysis of changes in land use and spatial structure is needed in Tembalang District, Semarang City. This study aims to (1) Identify the physical impact of urbanization on the growth of built areas in the study area; (2) Identifying changes in spatial structure based on the number of facilities in the Tembalang District. This research uses a mixed research method. Where in the analysis using the weighted centrality index method and map overlay The results of this study indicate an urban process that has an influence on land use change, where during the period of 11 years there was an increase in the area of the built area compared to the green area. Thus, the addition of areas built both housing and infrastructure change the spatial structure of Tembalang District from 2003 to 2014

Keywords: Urbanization, Land Use Change, Spatial Structure

Preliminary

The growth of a region that is quite high often occurs in areas that have a special role, be it the central region of the economy, education and government. That is one of the causes of the formation of new areas or commonly called new urban areas. During the formation of new urban areas there is an urban process called urbanization.

Indonesia is one of the countries experiencing urbanization, where at times rural agricultural land in Indonesia has changed into non-agricultural land. Especially in the area of Java, the high number of existing population causes the need for facilities and infrastructure to increase, both settlements and supporting facilities for residents' activities. The increase in the need for facilities is one factor increasing the level of development in Java. Widespread urban physical development will form an uncontrolled spread, so that there is a change in the area from rural to urban, especially in Java, as well as the tendency of growth rates in cities to decline, while in the surrounding area increases (there is a process of 'urbanizing' the surrounding area).

Talking about the process of urbanization, according to Sugiono Sutomo urbanization is a process of urbanization urbanization is a process of the formation of urban life that is different from rural life, in an economic, social and physical context. In the book Urbanization and City Morphology, Alain Garnier (1984) mentions that one of the notions of urbanization is a process of developing and concentrating the built space. Where in this case there is a change in land use in an area (agriculture to non-agriculture). As is the case in the city of Semarang. The limited area of the City of Semarang which has increased development and the rate of population growth has consequences for one of the sub-districts in the City of Semarang. So the addition of tertiary institutions in Tembalang District was made as the main generator of land use change

The limited administrative area of a city that has increased development and the rate of population growth which is increasing rapidly from year to year has consequences for the region to expand. The need for higher facilities is anticipated by the government by adding educational facilities to the periphery. This can be seen from the change in land use in one of the Semarang City sub-districts. The development of tertiary institutions in the southern part of Semarang City, precisely in Tembalang District, is the basis of the urbanization process.

Urbanization that often occurs not only gives a change in terms of land, where agricultural land has changed into non-agricultural land. Urbanization often has an influence on the spatial structure plan that has been set by the government after the RTRW (Regional Spatial Plan) has been established. The impact that occurs if there is a

change from non-build up land to a build-up area, will not only have an impact in terms of the extent of the infiltration area which is reduced but there will be higher pollution pollution than before. One area that is experiencing urbanization is Tembalang District, Semarang City.

In the beginning, Tembalang District was a green land in the form of agriculture (rice fields) and community plantations that functioned as conservation areas, namely water catchment areas. Rice fields and plantations in the Tembalang Region began to turn into built-up land since the establishment of tertiary institutions in the 1980s (Samdikun, 2005). Since then the campus has gradually become a development plant in Tembalang District. The area that was originally a rural area began to grow into a sub-urban area (sub-city / part of the city area) and continued to grow rapidly until 2000. It can be seen from the emergence of a number of housing areas that are scattered around the campus and continue to emerge until 2012. Land area in the District Tembalang before experiencing changes in land use, where the land use of Tembalang District in 2000 was still dominated by moor where the extent of moor reached 22796.7 Ha. The largest area of land use in 2000 for TPU land was 86.14 Ha while the number of paddy fields and drylands was 2611.9 Ha, while for built up areas (settlements, housing and other services) was 1266.31 Ha. The total area of Tembalang District in 2012 experienced a change in the area of land use, namely a decrease in the area of rice fields which was originally 332.23 Ha to 225 Ha while the built up area experienced an increase, for example, an increase in housing area which previously amounted to 157.47 Ha to 276, 79 Ha

In 2014 the Semarang Local Government made a Regional Regulation on the Semarang City Regional Spatial Plan. Where in article 10 (1) point (e), that Tembalang District is BWK (City Region Section) VI. BWK (Part of Urban Area) VI in the Regional Regulation is an education area especially for tertiary institutions. Along with the determination of Tembalang District as an educational area by the local government, urbanization will occur which will have an impact on land changes. Not only changes in terms of land will occur in areas experiencing urbanization but in terms of spatial structure will also change.

Urban processes that occur in Tembalang District will have an impact on changes in existing land use. The addition of facilities and infrastructure as well as housing changes the existing land use. Where it has continuity with changes in the existing spatial structure. So, this area requires an analysis of spatial structure as a physical impact of urbanization. In order to obtain a relevant suggestion to determine the spatial structure that can provide development direction in accordance with government regulations.

In accordance with the objectives of this study, the scope of study material includes:

1. Analyzing land use change in 2003-2014 that occurred in Tembalang District.
2. Reviewing the development of built areas caused by urban processes in the study area.
3. Analyzing changes in the spatial structure of Tembalang District based on 2003 and 2014 data

Research methods

In this study the authors used a qualitative quantitative method. Quantitative methods are carried out in calculating the extent of changes in the use of built land as a physical impact of urbanization, as well as calculating the weighted function and weighted centralized index based on numerical data from the village of Tembalang District. While the qualitative approach is used to describe the relationship between land use changes that occur in the study area and changes in spatial structure based on regional characteristics and residents of Tembalang District.

The analysis used in this study is divided into several analyzes, with the following analytical methods:

1. Analysis of Changes in Land Use (Overlay)

This analysis is intended to determine land changes and the physical impact on the growth of built areas as a result of urbanization itself. The overlay method was chosen to support this analysis to see land use changes that occurred 11 years ago.

2. Spatial Structure Analysis (weighted centrality index)

This analysis is intended to gather information needed to determine regional service centers and a network of other facilities and infrastructure that support these service centers. Determination of service centers can be used as a reference area / village that is experiencing urbanization.

The research variable is an attribute, the value of the nature of the object, individual / activity that has many specific variations between one and the other that has been determined by the researcher to be studied and carried out information search

to draw a conclusion.

- Changes in Land Use in Tembalang District
  Knowing the amount of land use change that occurred in Tenbalang District as one of the effects of urbanization.
- Impact of Urbanization from the physical aspect
  According to the KBBI (Big Indonesian Dictionary) the impact is a strong influence that brings consequences, both negative and positive. In this study, urbanization is an urban process that will certainly have both positive and negative effects, both large and small.
- Space Structure Tembalang District
  Knowing the effect of the urban process on the urban spatial structure of the Tembalang District based on the 2003-20014 Kecamatan Podes village data.

Condition of Regional Facilities

A. Educational Facilities

Educational facilities are one of the facilities needed by the community to improve welfare, especially in the academic field. In 2003 the highest number of educational facilities, namely kindergarten, was 48 units. In 2014 there was a decrease in the number of units of childhood education facilities, but an increase in the number of educational facilities in other units such as elementary schools, junior high schools and tertiary institutions. This happened along with the addition of the population in Tembalang District.

It was mentioned in the previous explanation that the most number of facilities is kindergarten, for the distribution of the most kindergarten in Sendangmulyo Village as well as other educational facilities, more in Sendangmulyo Village. The total number of educational facilities in the whole Sendangmulyo Village is 25 units. The number of education facilities ranked second is Tandang Village by 18 Units, out of the 18 units of educational facilities available in Tandang Village the most are Private Kindergartens and Public Elementary Schools and its equivalent. This makes Tandang Village ranked second in terms of the number of educational facilities in Tembalang District. The villages that have the lowest number of facilities are in the Kramas Kelurahan with only 3 units, this is because the area of Kramas is smaller than the other kelurahan, which is 93 hectares. So that for the fulfillment of educational facilities other than kindergarten and elementary school, residents of Kelurahan Kramas use educational facilities in other kelurahan. Of the 12 existing kelurahan that only had the facilities of the SLB education and private academy / PT private sector in 2003 were Sendangmulyo Kelurahan.

For 2014 the Sendangmulyo Village to become the Kelurahan that has the highest number of educational facilities by 29 units. In terms of the total number of educational facilities in Tembalang District in 2014, there were 23 units of the Meteseh Village, consisting of 8 Kindergartens, 1 Public Elementary School, 3 Private Elementary Schools, 4 Private Junior High Schools, 2 Private High School Units, 4 Units Islamic boarding school, and 1 unit of Diniyah Madrasa. For PT Negeri in Tembalang District, only 2 Units are located in Tembalang Village. The villages with the lowest educational facilities are still the same, namely the Kramas Village with a total of 3 units.

B. Health Facilities

Sendangmulyo Urban Village is the village that has the highest number of facilities, which is 46 units. The dominance of health facilities in Sendangmulyo Village is posyandu. Whereas the hospital is in Mangunharjo Village and the maternity hospital is in Sendangmulyo Village. The second rank in terms of the total number of health facilities is in the village of Meteseh. The second highest number of health facilities is in the Meteseh village because the posyandu facilities are the most compared to other kelurahan after Sendangmulyo. For the Kelurahan which has the lowest number of health facilities, the Jangli Kelurahan is only 3 units.

Data in 2014 explained that the kelurahan which had the highest number of facilities was still Sendangmulyo Kelurahan with 62 units. Secondly, there were 40 units of the Meteseh Kelurahan consisting of 3 pharmacies, 29 posyandu units, 2 midwife practice units, and 6 doctor practice units. The village with the lowest number of health facilities is Jangli District with 5 units.

C. Economic Facilities

In 2003 the most supporting facilities for the economy of Tembalang District were the small food-producing industries. For 2014 grocery stores / food stalls and food stalls dominate the existing economic facilities in Tembalang District, but small food-producing industries still have a contribution in the economy of Tembalang

District with a total of 135 units spread across twelve sub-districts in Tembalang District. For the last year namely 2015 the highest economic facilities namely shops / kiosks / stalls, this is due to the large demand for grocery items needed by the local community both native and migrant

In 2014, Sendangmulyo and Tembalang Village were the villages with the most economic facilities compared to the others. Then for the second rank is Kramas Village with a total of 8 units of economic facilities. The economic facilities in Kramas Urban Village are more small food industries. Whereas in 2014, the largest number of economic facilities was in the Kelurahan of Meteseh because there were quite a number of shops / stalls in the village of Meteseh. Whereas the Village with the lowest number of facilities is in Rowosari Village, because the first Rowosari Village does not have so many settlements so that the fulfillment of facilities in particular is not too much.

Tembalang District is one of several districts in the city of Semarang. The area of Tembalang District is 4019.44 Ha. In general, Tembalang District is a hilly area with a land slope of 30% - 75%.

With the hilly condition of Tembalang District, the land use of Tembalang District in 2003 was dominated by moor with an area of 1544 Ha. Where moor is an area with dry land that depends on rainwater irrigation. The use of upland land itself is more centered in the middle of Tembalang District. Not only the moor dominates land use in the Tembalang District, but settlements also rank second in the land use of the Tembalang District. Location of settlements in Tembalang District in 2003 was mostly located at the top of Tembalang, this is because Tembalang residents who live at the top of Tembalang District easily mobilize to the center of Semarang City. Whereas in 2003 the level of building construction was not too high, the amount of which was only 100.09 Ha.

Over time, the Tembalang District underwent a process of urbanization at the same time as being designated as an educational area. With the addition of settlements supported by the construction of facilities and infrastructure, both the construction of public and social facilities. The occurrence of urbanization (the process of urbanization in Tembalang District increased the development of an area, in which case the area of settlements increased to 1715,697 Ha and the addition of the building area to 156.6 Ha The extent of dry fields in Tembalang District in 2014 was 1365 Ha.

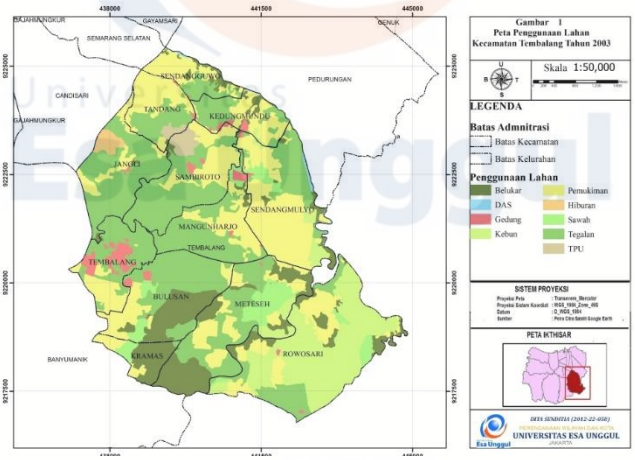

Figure 1
Land Use 2003

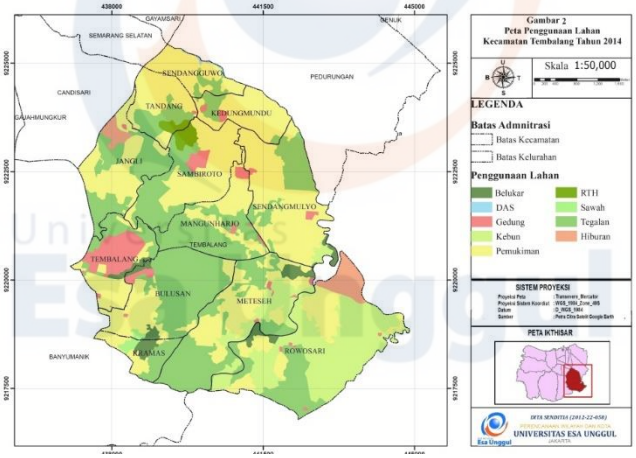

Figure 2
Land Use 2004

Source: Results of Processing Google Earth Satellite Imagery 2003 -2014

Analysis of Changes in Land Use

Land use changes that occur in Tembalang District as a result of urbanization. After conducting a series of processing of Google Earth satellite imagery map data in 2003 and 2014 using a geospatial information system, it was found that the land area has changed by 1487.08 Ha from the area of Tembalang District. Changes that occur in Tembalang District not only turn into a build up area but there are

some of the land that has changed land use / land use change into agricultural cultivation areas or on the land use change map below, it appears that land changes that occur are spread throughout the existing villages. The most changing region or kelurahan is Rowosari Kelurahan.

Table 1

Changes to Land Use in Tembalang District in 2003 - 2014

NO	INFORMATION	AREA (Ha)	
		2003	2014
1	Teglan	1544.06	1365.32
2	Gedung & pemukiman	1250.25	1872.297
3	Kebun	506.18	521.29
4	Sawah	164.88	14.69
5	DAS	11.27	4.25
6	Belukar	531.84	83.18
7	Hiburan	27.07	86.3
8	TPU	42.42	36.33

Impact Analysis of Urbanization from Physical Aspects

Like the previous discussion, land use changes in Tembalang District are spread throughout the Tembalang District area. By identifying the types of land use in 2003 with the land use in 2014, we can know the amount of land use that has changed as described in the previous exposure. After identifying the amount of land use that has changed in Tembalang District, it can be seen that the change in land use is due to the rural to urban process in Tembalang District.

Based on data from the population in 2003 and 2014 there was an increase in the population of 120,697 people over a period of 11 years. Population growth that occurred in Tembalang District was not only caused by the large number of births that occurred in Tembalang District, but the number of migrants was also another factor causing an increase in population to increase over the past 11 years.

Based on data on the number of migrants in the Tembalang District, it can be seen an increase in the number of residents moving to the Tembalang District. In 2003, 130 people moved to Tembalang and 5662 people in 2014. Between the population in Tembalang District is a correlation that can explain the reasons for urbanization in Tembalang District. high demand for shelter causes demand for shelter to increase. This is evidenced by the exposure of interviews conducted by researchers, local stakeholders describe changes in existing land use (moor-settlements) due to the ease of developers doing

development so that an increase in arrivals to the District of Tembalang. For more details, see the bias table 2

On the land use change overlay map, there are four specifications of changes that occur in Tembalang District, which are fixed, non build up -> non build up area, non build up area -> build up area, build up area -> non build up area. Fixed (no change), non-build up -> non-build up means that the land undergoes permanent changes, changes remain to open land (non-build up) such as changes in fields turn into rice fields, non-build up areas -> build up areas where changes occur open land use becomes built up land. This is what has a physical impact on an area that is experiencing urbanization (the process of urbanization). if an area experiences a development, it will cause development to slow down due to the need for other facilities. When viewed based on data on the identification of land use changes in the Tembalang District, land that did not change was 2811.67 Ha from the area of Tembalang District. While the total area that experienced a change of 1173.90 Ha which is divided into 711.98 Ha non-build up to build-up area, 461.91 Ha for land changes from non-build up> non-build up and build-up> non-build up.

Table 2
Land Use Change in Tembalang District

TETAP		***2811.6732***
BERUBAH	***Non Build up ›Build up***	*711.98108*
	Non Build up › Non build up	*461.91*

Source: Results of google earth image overlay map 2003 - 2014

Table 3
Effects of Changes in Land Use with population 2003 - 2014 Tembalang District

BUILD UP AREA	Change LU		Change in population	
	2003	**2014**	**2003**	**2014**
Buildings & settlements	1250.25	1872.297	105,219	154,697
Entertainment	27,07	86.3		

Source: Results of overlay of Google Earth imagery map 2003-2014 and Population Data of Tembalang District in 2003-2014

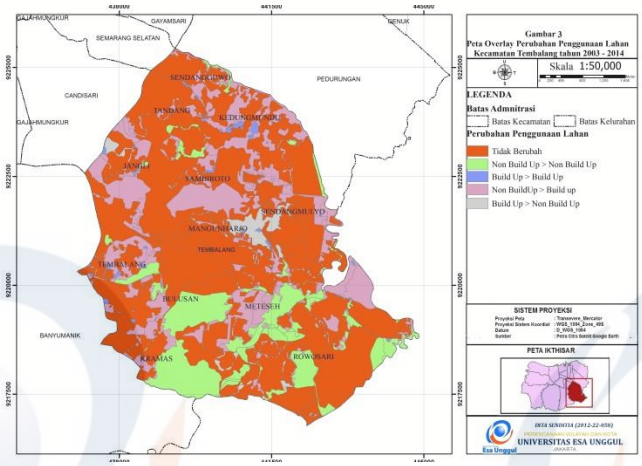

Figure 3
Land Use Change 2003 - 2014 Overlay

Source: 2014 Overlay Analysis Results

Analisis Struktur Ruang (indeks sentralitas weighted)

Based on the calculation of the weight function of Tembalang District based on the Podes data of Tembalang Village. Obtained from 12 existing sub-districts, villages that have a large number of facilities that are found in Sendangmulyo Village. When related to the population and number of facilities, Sendangmulyo Village is one of the villages in Tembalang District that has a large population. Thus, the construction of facilities and infrastructure is needed to facilitate the community to meet their needs in 2003. Characteristically the Sendangmulyo Village area is an area that can be said to be sloping (not in the hill / top area) so that it is easy to carry out development, both housing construction and construction of facilities and prasar. The fulfillment of facilities in Sendangmulyo Village is more on the fulfillment of educational facilities (elementary to high school level) while for higher education facilities (universities or academies) located in Tembalang and Kedungmundu Sub-Districts. Health facilities in Sendangmulyo are

more on local scale fulfillment, for regional scale health facilities are in Mangunharjo Kelurahan based on 2003 Podes Village Tembalang Village data

The calculation results of the weighted centrality index describe the total of each kelurahan in the kelurahan, which in turn can be concluded a determination of the spatial structure of the Tembalang District based on applicable order provisions. The weighting of the order in Tembalang District stated that the first order was Sendangmulyo Kelurahan, second order was Sambiroto Kelurahan, the last order was Jangli Kelurahan, where the total weight of the function was only 7 units of all existing facilities and in terms of development it had not been done much in Jangli Kelurahan. Determination of the Order in the calculation of the centrality index is weighted below based on the total amount of each calculation that exists with the difference in each order of ± 200 points. For more details, it can be seen in tables 4 and 5 and figure 4 to see the spatial structure map according to the weighted centrality index calculation.

Table 4
Calculation of Function Weight of Tembalang District in 2003

No.	Desa	Jumlah Penduduk	FASILITAS PENDIDIKAN												Total
			TK Swasta	SD Negeri	SD Swasta	SMP Negeri	SMP Swasta	SMU Negeri	SMU Swasta	SMK Swasta	Akademi /PT Negeri	Akademi /PT Swasta	SLB Negeri	SLB Swasta	Pondok Pesantren Diniyah	
1	Rowosari	8545	2	2	3	0	1		1						2	11
2	Meteseh	8307	7	1		0	2		1						2	13
3	Kramas	1833	1	2		0			0							3
4	Tembalang	3920	1	1		0			0		2			1	1	6
5	Bulusan	2749	1	2		0			1						2	6
6	Mangunharjo	5124	2	1	1	1			0							5
7	Sendangmulyo	22402	10	5	2	1	2		3	1					1	25
8	Sambiroto	8709	4	4		0		1	0			1	1			11
9	Jangli	5031	2	1		1			0							4
10	Tandang	15775	8	8	2	0			0							18
11	Kedungmundu	7487	4	2		2		1	0		1				1	11
12	Sendangguwo	15337	6	3	1	0			0						1	11
	Jumlah		48	32	9	5	5	2	6	1	3	1	1	1	10	
	Sentralitas Total		100	100	100	100	100	100	100	100	100	100	100	100	100	
	Bobot		2.08	3.1	11.1	20.0	20.0	50.0	16.7	100.0	33.3	100.0	100.0	100.0	10.0	

Sumber : Podes Desa Kecamatan Tembalang Tahun 2003

No.	Desa	Jumlah Penduduk	FASILITAS KESEHATAN								Total
			Rumah Sakit	Rumah Sakit Bersalin	Poliklinik	Puskesmas	Puskesmas Pembantu	Praktek Dokter	Praktek Bidan	Posyandu	Apotek	
1	Rowosari	8545				1				8		**9**
2	Meteseh	8307						1		19		**20**
3	Kramas	1833						2		4		**6**
4	Tembalang	3920			1			2	1	7		**11**
5	Bulusan	2749					1			5		**6**
6	Mangunharjo	5124	1				1	1	1	7		**11**

7	Sendangmulyo	22402		1	1		1	5	3	29	3	**43**
8	Sambiroto	5031			1	1	1	1	3	9		**16**
9	Jangli	15775							1	1		**2**
10	Tandang	7487			1			1	1	1		**4**
11	Kedungmundu	15337						3	2	6		**11**
12	Sendangguwo	105219					1		1	8		**10**
	Jumlah		1	1	4	2	5	16	13	104	3	
	Sentralitas Total		100	100	100	100	100	100	100	100	100	
	Bobot		100.0	100.0	25.0	50.0	20.0	6.3	7.7	1.0	33.3	

Sumber ; Podes Desa Kecamatan Tembalang Tahun 2003

No.	**Desa**	**Jumlah Penduduk**	**FASILITAS EKONOMI**			
			Penyewaan CD	**warung Telepon Umum**	**Koperasi**	**TOTAL**
1	Rowosari	8545		0		0
2	Meteseh	8307		9		9
3	Kramas	1833		5		5
4	Tembalang	3920	4	20		24
5	Bulusan	2749		3		3
6	Mangunharjo	5124		4		4
7	Sendangmulyo	22402	2	21		23
8	Sambiroto	8709	2	12		14
9	Jangli	5031		0		0
10	Tandang	15775	1	10		11
11	Kedungmundu	7487	1	9		10
12	Sendangguwo	15337	1	9	1	11
	Jumlah		11	102	1	
	Sentralitas Total		100	100	100	
	Bobot		9.1	1.0	100.0	

Sumber ; Podes Desa Kecamatan Tembalang Tahun 2003

Table 5

Total Calculation of Centralized Centrality Index Weighted by Tembalang District From Each Facility in 2003

No.	**Desa**	**Jumlah**	**Jumlah Total**	**Jumlah**	**Jumlah Total**	**RTH/Taman**	**Total**	**Ordo**

		Penduduk	F.Pendidikan	Total F.Kesehatan	F.Perekonomian			
1	Rowosari	8545	100.42	111.54	0.00	12.50	224.46	III
2	Meteseh	8307	94.38	152.40	8.82	0	255.60	III
3	Kramas	1833	8.33	43.27	4.90	12.5	69.00	V
4	Tembalang	3920	181.88	99.04	55.97	25	361.88	IV
5	Bulusan	2749	45.00	58.46	2.94	12.5	118.90	IV
6	Mangunharjo	5124	38.40	187.79	3.92	12.5	242.61	III
7	Sendangmulyo	22402	278.68	445.48	38.77	0	762.93	I
8	Sambiroto	8709	270.83	193.56	29.95	12.5	506.84	II
9	Jangli	5031	27.29	15.38	0.00	12.5	55.18	V
10	Tandang	15775	63.89	46.63	18.89	0	129.42	IV
11	Kedungmundu	7487	147.92	80.29	17.91	0	246.12	III
12	Sendangguwo	15337	42.99	89.23	117.91	0	250.13	III

Sumber ; Podes Desa Kecamatan Tembalang Tahun 2003 dan hasil perhitungan tahun 2016 dengan menggunakan perhitungan bobot fungsi 2003

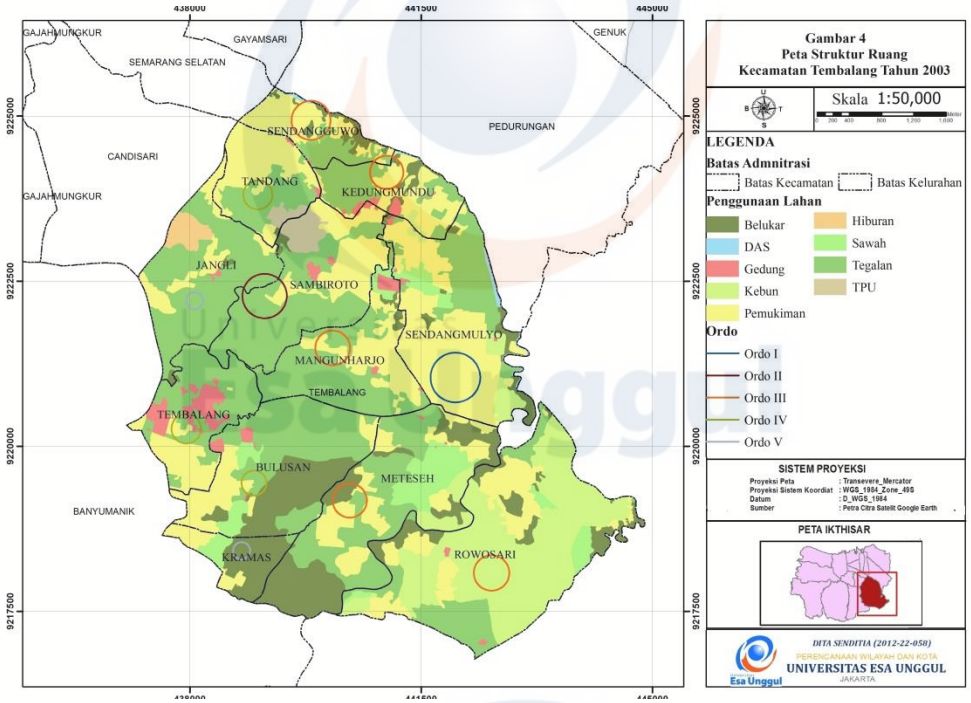

Figure 4

Map of Spatial Structure Analysis in 2003

The results of the service center hierarchy in Tembalang District are obtained from the weighting value by determining the weights as described above, namely:

1. Hirarki I : >550
2. Hirarki II : 550 – 450
3. Hirarki III : 450 – 200
4. Hirarki IV : 200 – 150
5. Hirarki V : < 150

Then based on the results of the analysis it can be said that the Tembalang District service centers are located in two villages, Sendangmulyo and Sambiroto, with a total value of 567 for

Sendangmulyo and 516 for Sambiroto. This happened apart from the number of orders calculated, supported by the number of existing facilities and land use in the two villages.

Judging from the BWK distribution plan, that Tembalang District is BWK VI, which is the education center of Semarang City. Where logically the division of sub-city services will be located in Tembalang Village. In reality, what is seen on the Semarang City spatial structure plan map is the placement of the city service sub-center in the Sendangmulyo and Meteseh Villages. The results of the 2014 ICT analysis and the provisions of the Semarang City spatial structure plan have relationships and similarities. Where the sub-district service center based on the order states that the Sendangmulyo Village is Order I or can be said to be a sub-district service center. Whereas the Semarang City spatial structure plan makes Sendangmulyo Urban Village a sub-center of city services. Both of these things can be said because the location of the Kelurahanmemyoyo is strategic so that it can meet the service needs of the City of Semarang.

In field conditions, Sendangmulyo Sub-District does not become a Sub-district service center because the Sub-district service center is in the Sub-district of Bulusan. It is said that the Tembalang District is an education center where the location of regional scale education facilities is in the Tembalang Village, which is one of the factors in the placement of the Tembalang District Office because the location of the Bulusan Village is adjacent to the Tembalang Village. While in terms of population, fulfillment of facilities and the construction of occupancy (in terms of land) is greater in Sendangmulyo Village.

The location of the service center in the village will make it difficult for residents who will take care of the documents in the sub-district (not strategic). The placement of the exciting service center at the top of Tembalang District requires residents of Tembalang District to take sufficient locations plus the lack of public transportation facilities from one other location, especially from the bottom of Tembalang District to the top of Tembalang District.

Table 6

Calculation of Function Weight of Tembalang District in 2014

No.	Desa	Jumlah Penduduk	FASILITAS PENDIDIKAN														
			TK Negeri	TK Swasta	SD/MI Negeri	SD/MI Swasta	SMP/ MTs Negeri	SMP/M Ts Swasta	SMU/ MA Negeri	SMU/ MA Swasta	SMK Swasta	Akademi/PT Negeri	Akademi /PT Swasta	SLB Negeri	SLB Swasta	Pondok Pesantren	Madrasah Diniyah
1	Rowosari	11019		4	2	4		2		1						3	2
2	Meteseh	15621		8	1	3		4		2						4	1
3	Kramas	3384		1	1										1		
4	Tembalang	5519		2	1							2				1	
5	Bulusan	5125		4	1	1		2		2	1					1	
6	Mangunharjo	8468		2	1	1	1	1						1	1	3	1
7	Sendangmulyo	33707	1	13	4	3	1	1			2				1	2	1
8	Sambiroto	12357		6	3	2			1				2		1	2	1
9	Jangli	6402		2	0	1	1										
10	Tandang	20382		8	4	3		1									1
11	Kedungmundu	11127		5	1	1	1						2			2	3
12	Sendangguwo	51296		6	2	2										4	2
	Jumlah		1	61	21	21	4	11	1	5	3	2	4	1	4	22	12
	Sentralitas Total		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	Bobot		100	1.64	4.76	4.76	25.00	9.09	100	20.00	33.33	50	25.00	100	25.00	4.55	8.33

Sumber : Podes Desa Kecamatan Tembalang Tahun 2014

No.	Desa	Jumlah Penduduk	FASILITAS KESEHATAN								
			Rumah Sakit	Rumah Sakit Bersalin	Puskesmas Tanpa Rawat Inap	Puskesmas Pembantu	Poliklinik/Balai Pengobatan	Praktek Dokter	Pratek bidan	Posyandu	Apotek
1	Rowosari	11019			1			1	2	9	
2	Meteseh	15621						6	2	29	3
3	Kramas	3384						1	1	4	0
4	Tembalang	5519	1				1	1	1	8	1
5	Bulusan	5125				1		1	1	5	1
6	Mangunharjo	8468	1			1		4	4	7	1
7	Sendangmulyo	33707	0			1	1	9	6	38	7
8	Sambiroto	12357		1	1	1	1	8	2	13	3
9	Jangli	6402								5	
10	Tandang	20382		1			1	2	1	14	2
11	Kedungmundu	11127						5	2	9	
12	Sendangguwo	51296				1		3	4	9	4
	Jumlah		2	2	2	5	4	41	26	150	22
	Sentralitas Total		100	100	100	100	100	100	100	100	100
	Bobot		50	50	50	20	25	2.44	3.85	0.67	4.55

Sumber : Podes Desa Kecamatan Tembalang Tahun 2014

No.	Desa	Jumlah Penduduk	FASILITAS EKONOMI											
			Kayu	Anyaman	Kain	Makanan	Pasar Permanen	Minimarket	Toko/Warung Klontong	Warung	Restoran	Koperasi	BANK Umum Pemerintah	BANK Umum Swasta	BPR
1	Rowosari	11019	1			6			14	9			0		
2	Meteseh	15621	2	2	8	19	1	6	312	60		1	1		
3	Kramas	3384				11		1	23	7			0		
4	Tembalang	5519			8	12		4	25	95	2	3	7		3
5	Bulusan	5125	1			4		4	71	78	3		0		
6	Mangunharjo	8468	3	2	8	21		2	52	30		2	0		
7	Sendangmulyo	33707				5	2	12	16	31		1	1		1
8	Sambiroto	12357	1		7	8		6	18	15	2	3	1		
9	Jangli	6402		15	4	5			67	14	1		0		
10	Tandang	20382	6	48	10	16		2	28	26		3	0		
11	Kedungmundu	11127	2			3		4	33	25			1	1	1
12	Sendangguwo	51296	1	1	9	25	1	3	121	21	1	1	2		1
	Jumlah		17	68	54	135	4	44	780	411	9	14	13	1	6
	Sentralitas Total		100	100	100	100	100	100	100	100	100	100	100	100	100
	Bobot		5.88	1.47	1.85	0.74	25	2.27	0.13	0.24	11.11	7.14	7.69	100	16.67

Sumber : Podes Desa Kecamatan Tembalang Tahun 2014

Table 7
Total Calculation of Centralized Centrality Index Weighted by Tembalang District From Each Facility in 2014

No.	Desa	Jumlah Penduduk	Jumlah Total F.Pendidikan	Jumlah Total F.Kesehatan	Jumlah Total F.Perekonomian	Total	Orde
1	Rowosari	8545	103.61	66.13	14.31	184.06	IV
2	Meteseh	8307	135.04	55.30	151.66	342.00	III
3	Kramas	1833	31.40	8.95	15.07	55.43	V
4	Tembalang	3920	112.59	91.16	206.61	410.36	II

5	Bulusan	2749	112.14	34.16	79.35	225.66	IV
6	Mangunharjo	5124	193.86	104.35	83.76	381.97	III
7	Sendangmulyo	22402	297.83	147.18	122.07	567.08	I
8	Sambiroto	8709	226.07	194.51	95.71	516.29	I
9	Jangli	5031	33.04	3.33	56.28	92.65	V
10	Tandang	15775	63.87	102.15	172.14	338.16	III
11	Kedungmundu	7487	126.81	25.89	157.75	310.45	III
12	Sendangguwo	15337	63.73	66.88	145.28	275.90	IV

II	**Bobot**
I	>500
II	500-400
III	400-300
IV	300 - 200
V	< 100

Sumber ; Podes Desa Kecamatan Tembalang Tahun 2014dan hasil perhitungan tahun 2016 dengan perhitungan bobot fungsi Kecamatana Tembalang tahun 2014

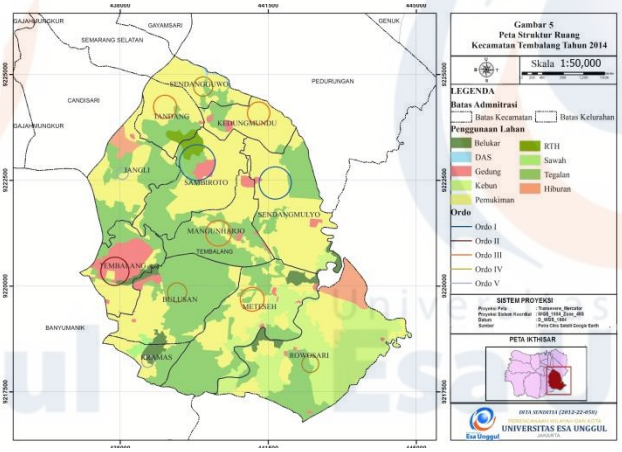

Figure 5

Map of Spatial Structure Analysis in 2014

Transportation Network Analysis

In the discussion of the previous road network description mentioned that the existing road network in Tembalang District is a local road network. This is what makes it easy for people to make accommodations. Described in the analysis of the Weighted Centrality Index calculation that the Sendangmulyo village is an area that became Order I among the twelve other villages. Sendangmulyo Kelurahan can be declared as a service center of Tembalang District other than based on the Weighted Centrality Index, field conditions in Sendangmulyo and Sambiroto Districts have complete facilities supported by easy accessibility. The locations of Sendangmulyo and Sambiroto Subdistricts are close to the middle of Semarang City where this facilitates the transportation system.

this can be seen from the change in land use that is quite long over 11 years.

Conclusion

The conclusions resulting from this study are as follows

1. Urbanization is an urbanizing process. Where in the process of urbanization that occurs in an area does not only have an impact on population growth, as many people know. But urbanization or urban processes that change the face of a city. It was seen from the change in land use of an area. Tembalang District is one area that has experienced changes in land use due to the process of urbanization. In this case the changes occurred during the period of 11 years. Land in Tembalang District experienced a change of 1487.08 Ha Changes that occurred not only changes from open areas to being built but there are other changes, namely changes from green areas to other green areas (fields to fields) amounted to 519.69 Ha and changes from built areas to open area of 20.21 Ha this is due to new construction at the top of Tembalang District so that the existing settlement is left by the old owner.

2. Weighting conducted by researchers using the weighted centrality index method. This is because the researcher is able to determine the District service center based on the existing hierarchy or order. The determination of order levels is based on the number of facilities available in each kelurahan obtained from Podes Desa Tembalang District. The spatial structure analysis conducted by the researcher was divided into 2 years, 2003 and 2014. That was due to see if there were changes in spatial structure based on existing data**.**

Judging from the results of the ICT calculation in 2003, the subdistrict center was found in Sendangmulyo Sub-district with a score of 506.84. The results are in accordance with the number of facilities in Sendangmulyo Kelurahan more complete and more compared to other Kelurahans. Along with the addition of existing facilities, the service center based on the results of the calculation of ICT still Sendangmulyo Village added with Sambiroto Village. Changes in order levels also occurred in the previous kelurahan.

Based on the results of the existing analysis with the existing field conditions. The center of the sub-district in the existing condition is the Tembalang Village. While seen from the field conditions in Bulusan Village, it does not have a large number of facilities. It's just that Bulusan Village is close to Kelurahan and Kecamatan that have state tertiary institutions (Tembalang Village and Banyumanik District).

Bibliography

Baja,M.Phil Prof. Dr. Ir. Sumbangan. 2012. Perencanaan Tata Guna Lahan.Yogyakarta. Andi Yogyakarta.

Glasson ,John. An Introduction to regional planning . 1978. British Library Catalouge. London

M Harahap ,Ahmad Royhan.2010. Urban and Regional Planning; Analisis (Teoritis dan Empiris) Perubahan Tata Guna Lahan Terhadap Ketersediaan Lahan dan Terhadap Migrasi Penduduk. Sumatera, Universitas Sumatera Utara.

Osman, Moh.Yoenus. 2014. Metode Analisis Perencaan.

Purwanto, suhadi. Studi Perubahan Penggunaan Lahan di Kecamatan Umbulharjo Kota Yogyakarta Tahun 1987-1996 Berdasarkan Foto Udara

RTRW Kota Semarang.

Samadikun, Budi Prasetyo dkk. 2014. Dampak Perkembangan Kawasan Pendidikan di Tembalang Semarang Jawa Tengah. J.Manusia dan Lingkungan, Vol.21, No.3 November 2014 : 366-376

Soedwi.Fringe area.2009. soedwi.staff.uns.ac.id. 14 maret 2016 (21:51)

Seotomo, Sugiono. 2013.Urbanisasi dan morfologi. Yogyakarta.Graha Ilmu

Yunus, Hadi Sabari.2000. Struktur Tata Ruang Kota. Yogyakarta.Pustaka Pelajar

Zenthot Yoga Asmara.2015. Analisis Perubahan Penggunaan Lahan dengan Aplikasi SIG dan Penginderaan Jauh di Kecamatan Tembalang Kota Semarang Tahun 2000-2012. Publikasi Karya Ilmiah. Geografi, Universitas Muhamiyah Surakarta

Website

Diambil pada hari kamis tanggal 7 Janiari 2016, 23.12 . http://www.nrdc.org/cities/smartGrowth/solslide/solslideinx.asp