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*Corresponding author(s) email:
hwijaya@lecturer.undip.ac.id

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Reclassification of Urban Growth in Rural Area, Temanggung Regency, Indonesia

Holi Bina Wijaya [1,2]*, Imam Buchori [1]

1. *Department of Urban and Regional Planning, Diponegoro University, Indonesia*
2. *Doctoral Program in Architecture and Urbanism, Diponegoro University, Indonesia*

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Abstract

Reclassification is part of urban growth components, together with the natural growth of birth and death, and migration from rural to urban areas. However, regarding the previous research, reclassification has demonstrated a shortcoming in studies because discourses on urban development have mostly focused on the strength of existing urbanized areas. Historical data confirms that the economic growth in urban areas is due more to a residual increase from the change in migration and reclassification rather than natural growth. This paper contributes to the empirical context discussion of the reclassification of urban growth and its subsequent spatial changes in the rural area of Temanggung Regency, Indonesia. The study utilizes the comparison analysis by examining the growth of industrial employment as an urban activity in rural areas and looking at this relationship with changes in the physical built-up area as an indication of the urbanization process. This study found that the reclassification in the Temanggung regency has encouraged urbanization in rural areas by developing industrial activities based on local resources and labor and promoting economic growth in rural areas. The reclassification that occurs is predominantly due to the wood products manufacturing business that is supported by the local workforce and resources rather than the active role of government institutions.

1. Introduction

Rapid urban development, especially in developing countries, requires a better understanding of the component of urban population growth (Mezgebo & Porter, 2020). The urbanization process has been accompanied by adverse socio-economic impacts for some time. Regarding the physical aspect, the expansion of urban areas undermines the demand for land (Ravallion et al., 2007; Simon et al., 2004). This situation enables us to understand that urban development needs to be improved to have a more beneficial impact on society and the environment (United Nations, 2017).

Demography is an essential component of urban development that scholars are interested in (Jones et al., 2020). The demographic part of urban growth is influenced by a combination of natural growth factors in urban areas, migration from rural to urban areas, and the reclassification of the population living in rural to urban areas (Farrell, 2017; Jiang & O'Neill, 2018; UN DESA, 2019). The empirical experience in China confirms that most urban population growth comes from reclassification, which accounted for roughly 33.4% of the total urban population growth from 2010 to 2015 (Li Gan et al., 2016). Unlike natural urban growth, migration and reclassification are residual factors related to economic growth (Gross & Ouyang, 2021). The urban transition in developing countries is different from developed countries. As in the case of developing countries in Asia,

many densely populated rural areas have the potential to develop into urban areas without the need for significant urbanization, which is an indication of an opportunity for reclassification (McGee, 2009).

Unfortunately, thus far, research on the reclassification of rural and urban areas remains limited (Farrell, 2017; Jones et al., 2020). Moreover, the conceptualization of reclassification as an independent research subject separate from demography, economy, and the urban transition has not been widely carried out, primarily due to limited supporting data (Bocquier & Costa, 2015), even the discussions were also less in historical accounts (Farrell, 2017). Most researchers tend to combine the effects of reclassification and migration when examining the contribution of reclassification to urban development (National Research Council, 2003; Preston, 1979). As well, most of the studies have not considered the spatial component as a critical factor in the reclassification process (Jones et al., 2020)

In Indonesia, there are administrative and statistical classifications of villages as an urban and rural areas. The administrative classification relates to the formal administration to governance autonomy of the villages (Law of Village, 2014), which is slow to follow the urban changes due to government bureaucratic mechanisms and the need for agreements of development stakeholders. The urban statistical classification was established by Statistics Indonesia as a national Central Agency on Statistics in 2010 and updated in 2020 (BPS-Statistics Indonesia, 2010, 2020) to better identify and monitor urban changes. The statical classification of the urban village is based on the three main variables, i.e., the population density, percentage of agricultural households, and the existence of urban facilities. Although the urban statistics classification information is more up-to-date, the available data are still limited to the last ten years and have not explained the mechanism of urban growth.

In the context of local government institutions in Indonesia, urban and rural administrative areas can be distinguished at the level of local village administrative areas, namely *Desa* (villages) and *Kelurahan* (urban villages). Kelurahan is the urban administrative unit generally found in the city region. However, it is also possible in the regency some *kelurahan* show urban function areas in the region as centers of activities and the collection and distribution of goods in the regional structure system. Formally, the procedure of village administration to become a *kelurahan* requires agreement from stakeholders at the village level and local government policies (Law of Village, 2014) that take time in the process to change.

Temanggung Regency has experienced the composition shift of the population's livelihood where agriculture sector in 2020 no longer dominates (41%). Meanwhile, there is the growth of urban employment sectors, which are the industry as well as trade and services, 18% and 39%, respectively (BPS - Statistics of Temanggung Regency, 2021), which was caused by the development of the wood products manufacturing industry in Temanggung Regency. These changes also impact built-up area expansion, especially in Kranggan and Pringsurat, which have become industrial designation areas. Due to the industrial activity and local economic growth, the potential for reclassification in the rural areas of Temanggung Regency is supported by the availability of local workers and resources supports, which is not much based on government policy initiatives as has happened in some other countries (Farrell, 2017; Farrell & Westlund, 2018; Goldstein, 1990).

This paper aims to demonstrate a context of the reclassification process on urban growth in rural areas based on local economic initiatives and agriculture resource-based industry. It examines the rural-urban reclassification regarding the shifts in rural employment structures, the development of the manufacturing industry in rural areas, and the changes in built-up areas. The discussion results provide an empirical context for the reclassification in urban growth and the impacts on spatial change in rural areas of the Temanggung Regency. The objective is achieved by examining the changes in the employment composition that compares the statistics data of Temanggung Regency and verifying the growth of the wood products manufacturing industry. The spatial examination was done with a GIS analysis to identify the growth of the built-up area in time series change.

2. Literature Review

Reclassification is an expansion of urban area as a part of urban growth components, together with the natural increase in urban population and rural-urban migration. It is also part of urbanization as the reclassification adds the number share to the urban population. Reclassification indicates the extension of urban boundaries, resulting in larger urban residential areas. This growth creates new urban areas that differ from rural regions and increases population, economic size, and density, contributing positively to urban growth (UN DESA, 2001, 2019). It may reflect the actual expansion of cities because of the socio-economic and technological changes and population growth, or simply as sudden changes in the definition of urban places. For instance, there were 6,211 designated towns in China in 1984, but these became 10,609 in 1984 or 71.81% in just four years. Reclassification also includes the growth of major metropolitan cities, suburban outskirts expansion, and increased commuting resulting from economic restructuring (Zhu, 2017).

There are two types of reclassifications mechanism. The first occurs when a settlement exceeds the minimum size or density threshold, meeting the requirements of an urban environment. The second type occurs when governments change the definition of "urban" and administrative status, as the United States did in the 1950s and China in the 1980s (National Research Council, 2003; Zhu, 2017). This phenomenon has reinforced that reclassification is a part administrative conversion process. Meanwhile, regarding the spatial context of urban expansion, the reclassification can be separated into three types: expansion (or shrinkage) of existing city boundaries, annexation (or surrender) of adjacent settlements, addition (or reduction) of new settlements that grow beyond the specified threshold (Dyson, 2011; Farrell, 2017; National Research Council, 2003).

As part of the process of urban and rural development in developing countries, regional growth changes fast as the result of economics and politics on urban growth (H. Farrell & Knight, 2003). In a demographic context, cities mostly grow due to a natural increase in population, births, and deaths. The economic factors consist of rural push and urban pull, which encourage rural to urban migration (Harris & Todaro, 1970; Jedwab et al., 2014). Village pressures are mostly related to conditions that promote villagers to migrate from their villages due to limited economic opportunities in rural areas.

On the other hand, the attractiveness of cities is the situation in urban areas that offer better jobs and incomes. Meanwhile, political factors correlated with the reclassification of rural areas into urban areas consisting of expansion of city boundaries, changes in the status of adjacent regions, and changes in the status of new areas outside the city's area of influence (Farrell, 2017). Based on research conducted by Gross, urban economic development is mainly correlated with residual urban growth, namely the increase in urban population originating from internal migration and reclassification of rural to urban areas (Gross & Ouyang, 2021).

Reclassification is a process of the rural area changing into an urban area characterized by developing industrial activities and urban services (Long et al., 2011). The urbanization process in developing countries is indicated by the growth in the number and size of urban areas, describing the development process and development challenges. In this process, there is a change in spatial, development institutions, society orientation, and social mobilization, leading to the interests and scale of the urban conditions (Brenner, 2013).

The Reclassification growth type can be framed as a valuable tool for addressing regional inequalities (Kulcsár & Brown, 2011) and is considered a productive strategy to stimulate economic development (Farrell, 2017). Furthermore, in the perspective of local development, the reclassification also can promote the administrative status and improvement the quality of rural areas, i.e., better autonomy and political power, improve access to infrastructure, increase the investment opportunities, as well provide revenues from land-based financing (Farrell & Westlund, 2018). Therefore, a proper reclassification policy may promote proper urban growth in rural areas to support improved quality of life in rural areas (UN DESA, 2021).

3. Study Area, Data and Method

3.1. Study Area

The study covers the administrative area of the Temanggung Regency in Jawa Tengah (Central Java) Province, Indonesia (see Figure 1). The selection of Temanggung Regency as the research study area is based on the observation of the reclassification process in the area in line with the growth of the wood products manufacturing industry in Temanggung Regency since the 1990s. The development of industrial areas affects changes in the region's employment composition. Significant changes in the built-up area, especially around the industrial designation area, indicate possible reclassification.

3.2. Data and Methods

The research seeks the relationship between the shift in the composition of the structural employment change, the development of the wood products manufacturing industry in rural areas, and the changes in built-up areas in the Temanggung Regency. The study uses secondary data and field verification results, including population and employment data, the number and location of manufacturing industries, and land cover data of Landsat TM data bands 5,7, and 8.

The shift in the employment compositions is conducted by comparing the sectoral labor numbers of Temanggung Regency from 2000 to 2020 from the secondary data of Temanggung statistics. The employment data is represented by selected sectors, i.e., the agricultural sector, industrial sector, trade, and services, as the leading activity indicators in the urbanization process. The number of people working in the agricultural sector characterizes rural activities, while the industrial, trade and service sectors indicate urban activities.

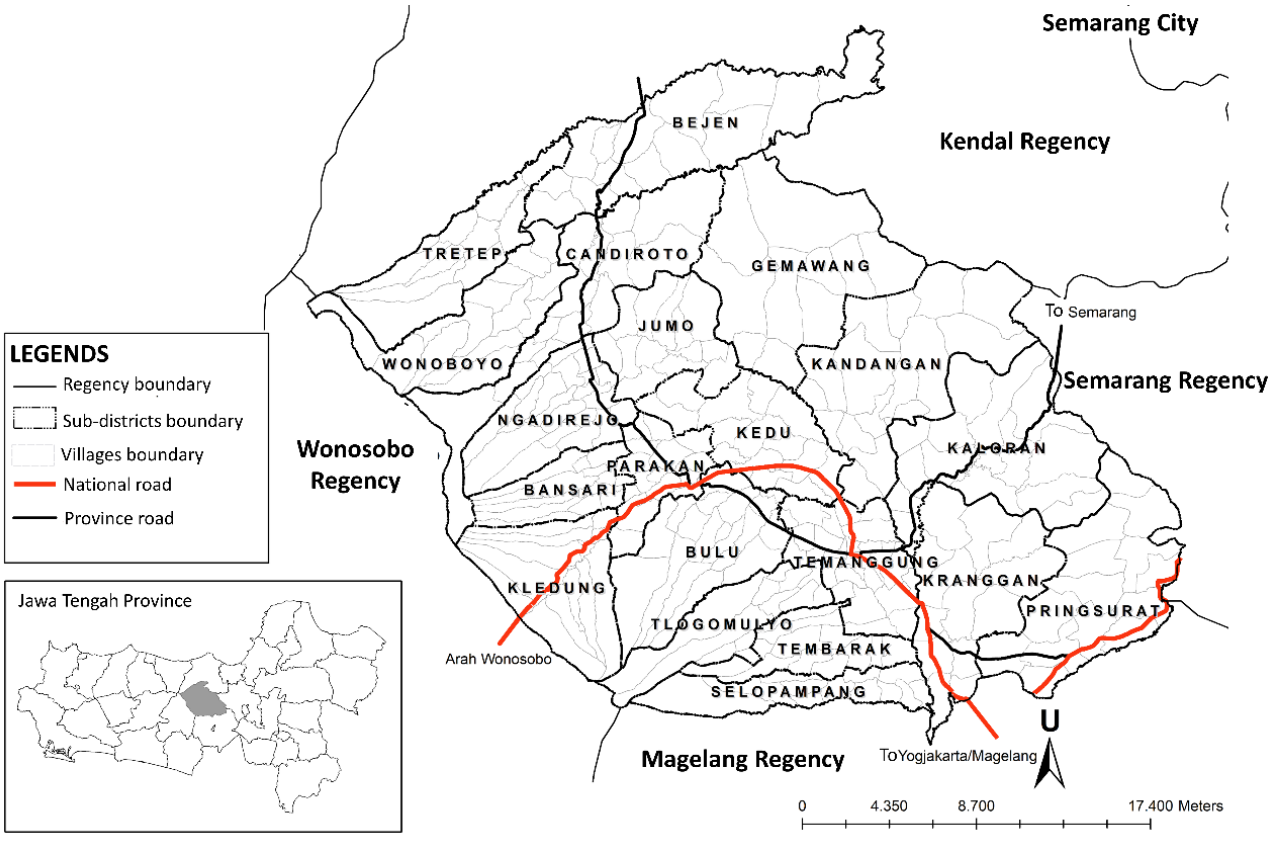


Figure 1. Map of the Study Area

Understanding the growth of the wood product manufacturing industry in Temanggung Regency is obtained by analyzing the secondary data and field verification. Secondary data depicts the industry's profile. Meanwhile, field verification is conducted to validate the number of industries, especially those still at work.

The analysis of spatial change was conducted in two stages, which identify the built-up area through supervised analysis on Landsat TM bands 5, 7, and 8, followed by overlaying the identified built-up area in time series. First, supervised analysis of land classification was carried out by selecting pixels that represented a recognized pattern or which can be identified with the help of other sources of information (Tewabe & Fentahun, 2020) on the Temanggung Regency digital map. Meanwhile, the overlay analysis to indicate the changes in a built-up area is conducted by comparing the results of the supervised analysis of built-up land cover on the maps of Temanggung Regency in 2000, 2010, and 2020 or the so-called post-classification comparison. This approach makes the possibility to identify differences between independent images classified each year, thereby enabling the creation and updating of GIS databases as classes/categories are assigned. As a result, a quantitative value for each class can be determined (Fichera et al., 2012).

4. Results and Discussions

The following sections elaborate on and discuss the reclassification of rural areas in the process of employment dan spatial changes in Temanggung Regency, Central Java, Indonesia. The analysis discussion follows some stages; the first, the discussion examines the level of urbanization and the rate of population growth in the Temanggung Regency. This process identifies the reclassification process that occurred in Temanggung Regency. The second analysis relates the reclassification process to the rural area's livelihood changes due to industrial development. The third analysis linkages the reclassification with the built-up area changes. The last discussion elaborates on the institutional and policy aspects of reclassification that exist in the Temanggung Regency as a part of the urban growth mechanism in developing countries.

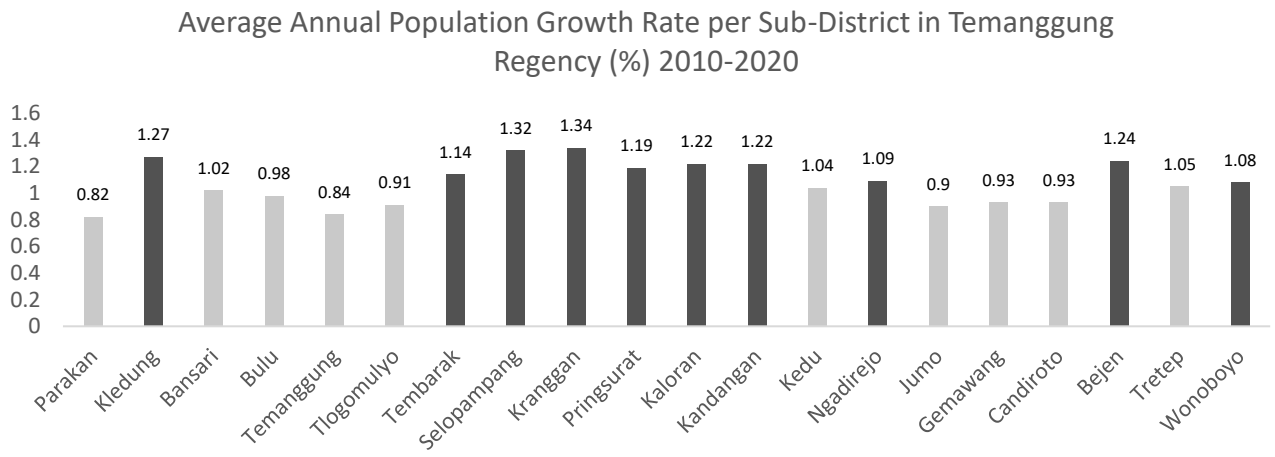
4.1. Population Profile

Temanggung Regency, as a research study area, is part of Java Island that the most densely populated area and a place for population concentration and urbanization in Indonesia (Firman, 2017). Data from the population census in 2020 shows that as many as 151.59 million people, or 56.1% of the 270.2 million Indonesian population, live on Java Island. However, the island area is only about 7% of the total area of Indonesia. Furthermore, identification of urban and rural village conditions in 2020 shows that as much as 65.15% of villages on Java Island are characterized as urban villages, which is the only island in Indonesia with a ratio of the number of urban villages that is larger than the rural areas (BPS-Statistics Indonesia, 2021). The current condition of the population phenomenon that occurs on the island of Java is mega urbanization that occurs on a massive scale, which indicates the transformation of urban villages (Firman, 2017; Setyono et al., 2016). Most of the regencies and cities around big cities experienced higher population growth than places in the city's center (Firman, 2017).

Rural and urban development in Central Java cannot be separated from the corridor area that connects the urban system in Java Island and Central Java province. Java Island has the main urban activities center in Jakarta metropolitan region in the western area, and Surabaya metropolitan region in the eastern area as a second level. Semarang city is in the middle of a northern corridor of Jakarta and Surabaya, which also connects to Yogyakarta, an urban center in the southern area, by a north-south corridor of the Central Java region. However, these last two cities are lower level than Jakarta and Surabaya. The geographical position between the two main urban centers in Central Java has influenced the region to become more urbanized in the last two decades (Setyono et al., 2016). Temanggung Regency, which is in the western area of the north-south corridor, has begun to develop into an urban area due to most of its region still being a rural area.

The population profile in Temanggung Regency regarding the growth rate and population density from 2010 to 2020 indicates that several sub-districts have experienced an increase in the population growth rate (see

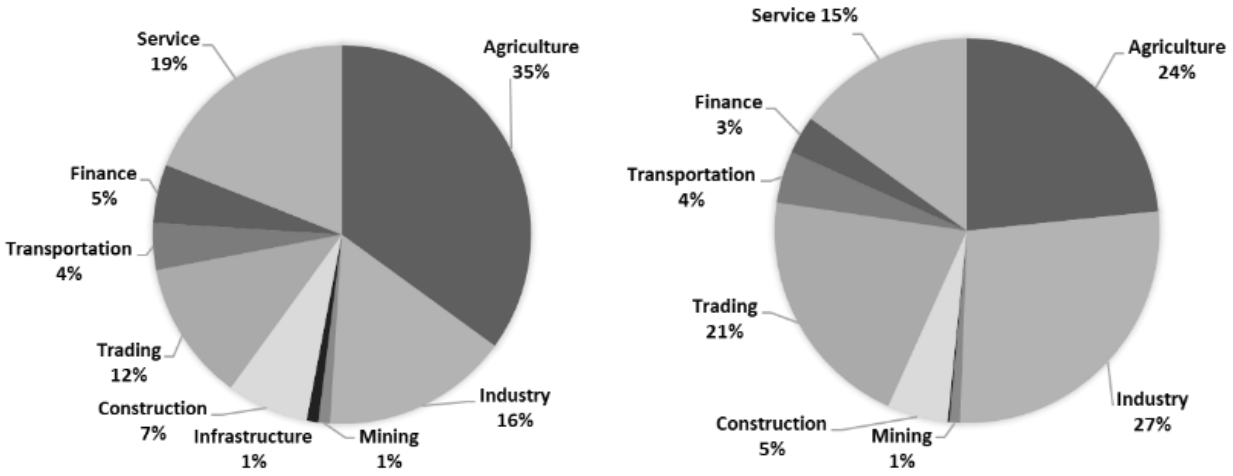
Figure 1). Part of the population growth with the highest rates is in the Kranggan, Pringsurat, Kandangan, Kaloran, and Selopampang areas (see Figure 2), where these areas are turning into urbanized areas.



Source: BPS - Statistics of Temanggung Regency, 2010, 2020

Figure 2. Average Annual Population Growth Rate in Temanggung Regency

The condition indicates the internal population growth in Temanggung is not evenly. Some sub-districts have higher growth rates than others, related to specific factors. But in general, the faster population growth in the regency does not occur at the current urban activities center in Temanggung and Parakan sub-districts. The higher change mainly happened in the area where new activities emerged in rural areas, i.e., the wood products manufacture industry at Kranggan, Pringsurat, Kandangan, and Ngadirejo; tourism and agribusiness in Kledung and Bejen; agribusiness in Tembarak, Selopampang, and Kaloran. The rural push and urban pull forces (Harris & Todaro, 1970; Jedwab et al., 2014) do not always promote the migration from rural areas to existing urban areas, but the forces can also promote the internal region movement from less to a faster developed rural area.



Source: BPS - Statistics of Temanggung Regency, 1990, 2020

Figure 3. GRDP Temanggung Regency at Current Market Price by Industry year 1990 and 2020

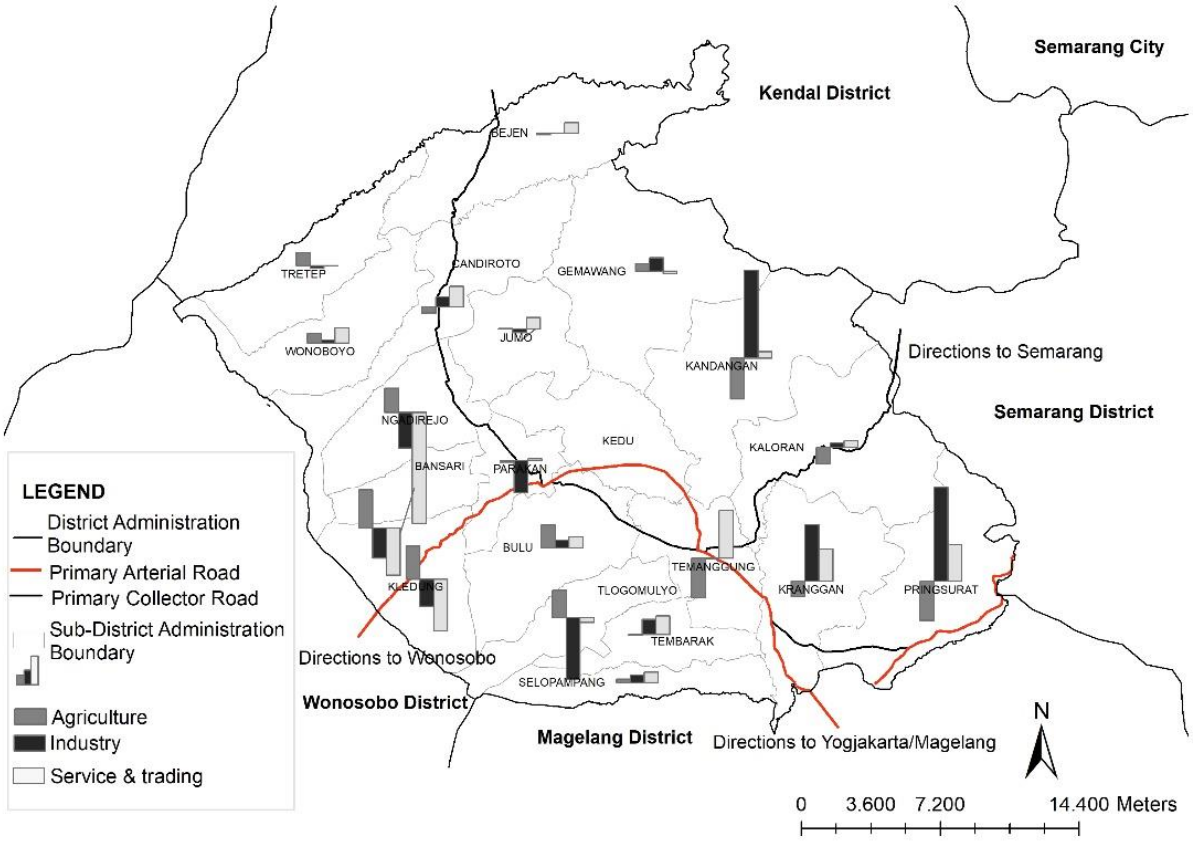
The process also seems to be a potential factor in increasing economic growth, as Dyson (2011) sees the population growth rate will benefit the region to improve its economy. Conditions in Temanggung Regency for economic growth were identified from changes in the value of GRDP from 1990-to 2020 (see Figure 3). The

differences in the economic sectors in the Temanggung Regency can be divided into two types. The first is the sector that consistently experienced a decline that was the agricultural sector, which from 1990 contributed 35% to the regional economy, reduced to 24% in 2020. Secondly, the industry sector has experienced an increasing share, which in 1991 contributed 16% to 27% in 2020.

Changes in the leading economic sectors in Temanggung Regency, which shift to the industrial sector, show sub-districts with higher population growth rates. Kranggan and Pringsurat sub-districts have a higher population growth rate that has been designated as industrial areas. In Temanggung Regency, it is indicated that industry influences population growth. The increasing industry and trading sectors, and inversely the decreasing agriculture sector, show the growth of the urban sectors. In a spatial context, the shifting economic sectors form the urban area expansion or reclassification of rural to urban areas.

4.2. Changes in Employment Structure

Temanggung Regency is a hinterland region with high-value agriculture products, e.g., tobacco, coffee, and woods. In the three decades, the area has undergone significant changes marked by the growth of the industrial and urban sectors. Statistical data shows population growth of 27% from 1990 to 2018, but the increasing number of workers in the industrial sector reached eighteen times from the original 4,544 workers in 1990 to 87,971 workers, and the urban service sector workers increased three times from the original 43,121 workers to 177,929 workers (the results of calculations by the Temanggung Regency BPS 1990 and 2018). On the other hand, the presence of local workers supports the significant wood processing products industry.

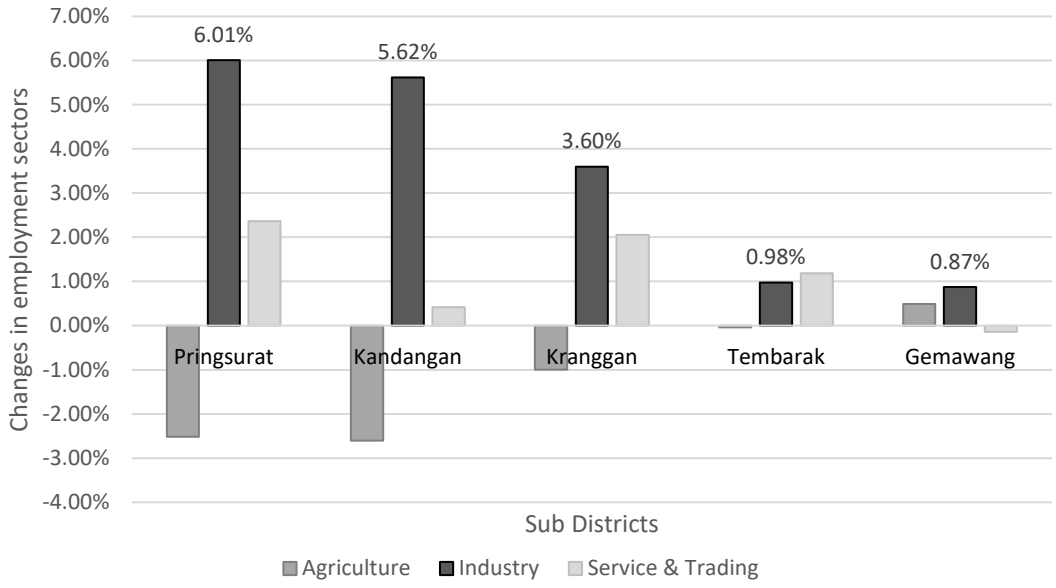


Source: Mapping of BPS - Statistics of Temanggung Regency, 2000, 2020

Figure 4. Map of the Employment Composition Change per Sub-district from 2000 to 2020

As for the employment distribution per sub-district (see Figure 4), most of the population aged ten years and more who have worked are laborers in the agricultural sector. There are eighteen of twenty sub-districts in

Temanggung Regency, with the majority population in the agricultural sector. This condition occurred from 2010 to 2020, although there were fluctuations in the percentage of each sector. There are two sub-districts in Temanggung Regency with the dominant population working in the non-agricultural sector, namely Parakan and Temanggung sub-districts. Most of the people in these sub-districts work in the trade and service sector. The dominance of workers in the trade and service sectors in these two sub-districts occurred from 2010 to 2020.



Source: BPS - Statistics of Temanggung Regency, 2000, 2020

Figure 5. Five Sub-districts with the highest employment change in the industry sector in Temanggung Regency year 2000 – 2020 (%)

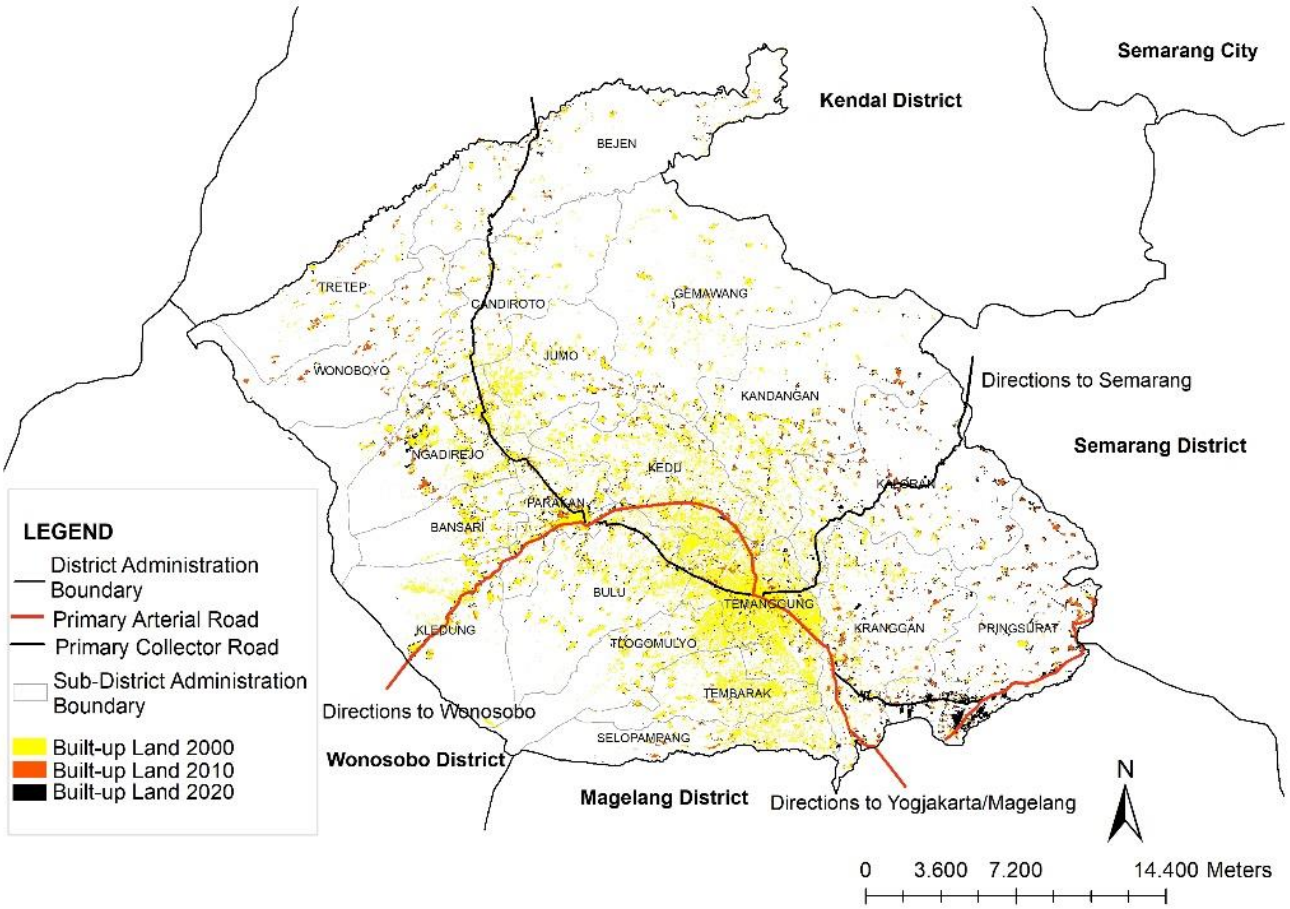
Besides agriculture, trade, and services, the industrial sector absorbs plenty of rural labor. Based on the employment distribution, several sub-districts have significantly changed in industrial sector employment compared to other sub-districts, especially Pringsurat, Kranggan, and Kandangan sub-districts (see Figure 5). The research in Temanggung Regency found that the changes in population activities have the same characteristics as several developing countries in Asia, which indicates the transformation of rural areas because of industrialization and urbanization. The agricultural sector's productivity characterizes the transformation, labor productivity, technology changes, and improvements in rural infrastructures and socio-economic conditions (Buchori et al., 2021; Liu et al., 2017; Long et al., 2011).

4.3. The Development of Industry and the Spatial Changes.

The study analyses the built-up area changes of the Temanggung Regency in 1990, 2000, 2010, and 2020 (see Figure 6). Industrial growth has affected the urbanization of suburbs and the peri-urban regions (Buchori et al., 2021). In contrast to the general urbanization understanding centered on current cities, the new form of urbanization in peri-urban areas tends to be in situ, as in many cases of urbanization in Central Java (Setyono et al., 2016). Handayani (2013) also argues that the shift from rural to urban areas in Central Java is due industrialization process that occurs not only in larger urban centers but also in smaller urban areas. (Handayani, 2013).

Land cover changes in Temanggung Regency mainly exist along the main road corridor. The built-up area changes in regency between 2000 and 2020 were mostly higher in the sub-districts of Kranggan, Pringsurat, Bansari, and Bulu. The major socio-economic forces that mainly drive the rural land-use change are industrialization, urbanization, structural adjustment of agriculture, and housing construction in the rural area

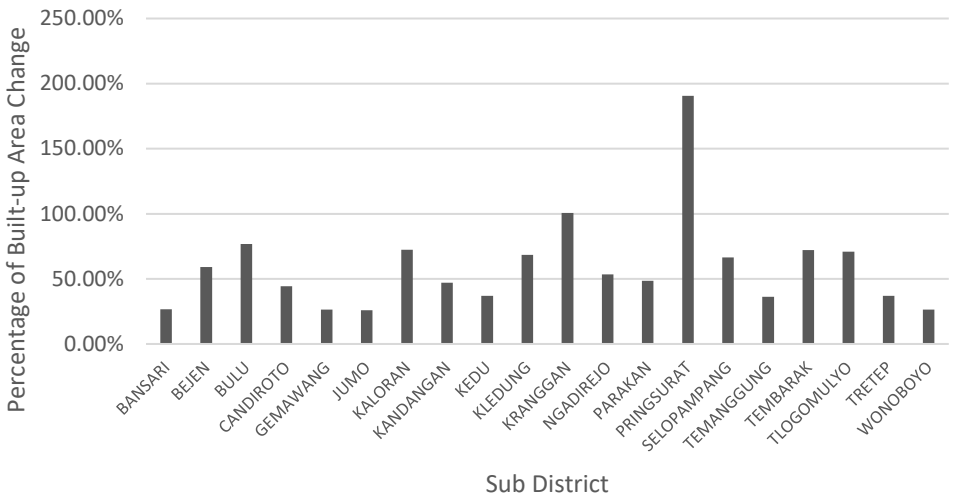
(Li et al., 2010). This region changes because of the increasing extent of economic activity and the need for rural land, impacting the growth of industrial activity in Temanggung Regency. The industrial activities shift the employment in the regency from rural and agricultural activities to become workers in manufacturing activities that encourage the development of built-up areas. These growths also indicate the shift of rural population to urban due to the change from rural to urban employment sectors.



Source: GIS analysis on Landsat TM data years 2000, 2010, and 2020.

Figure 6. Map of Land Built-up Area Changes in 2000-2020

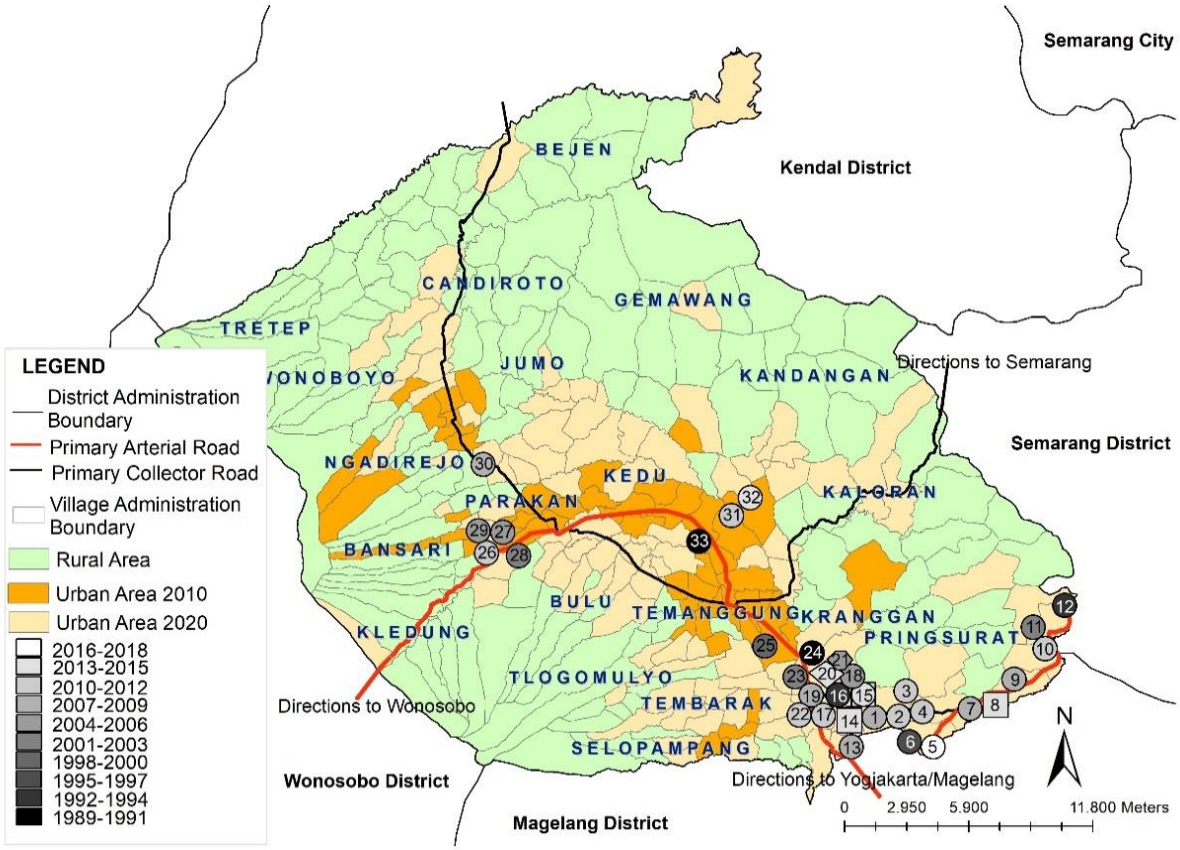
The tendency to become the built-up area per sub-district has increased (see Figure 7). The increase of built-up areas is influenced by the development of community needs and socio-economic conditions. The most significant land-use change occurred in the Pringsurat sub-district, especially from 1990 to 2000 (440.07%) and from 2010 to 2020 (249.19%). In addition, the Kranggan sub-district is the second-highest built-up area change, namely from 2010 to 2020 (152.56%). The significant difference in built-up land in the Pringsurat sub-district and Kranggan sub-district is caused by the development of the main road to Magelang Regency and Yogjakarta Province. In addition, the result of policies for the Kranggan and Pringsurat sub-districts as industrial estates also encourage the development of built-up areas in the Temanggung Regency.



Source: GIS Calculation Results, 2021

Figure 7. Percentage of Built-up Area Change in Sub-Districts, Temanggung Regency 2000–2020

This study indicates that the development of the wood industry is related to spatial changes, especially in the phenomena of built-up area growth. Therefore, identifying the spatial difference by comparing the built-up area in 2000, 2010, and 2020.



Source: BPS-Statistics Indonesia, 2010; BPS, 2021, and field survey in 2020.

Figure 8. Changes in the urban and rural characteristics of villages and manufacturing company locations.

Furthermore, the distribution statistics reclassification of the urban area is compared with the distribution of wood products manufactures agglomeration (see Figure 8 and Table 1). The calculation result shows the changes in the built-up area emerge in the surrounding wood products manufacturing agglomeration, which is primarily residential. The spatial impact of industrial development in Temanggung shows about 500 ha of built-up area was formed within a 3-kilometer radius of the agglomeration, and about 1500 ha of the built-up area grew within a 5-kilometer radius.

Table 1. Changes in industry and urban-rural areas in the sub-districts, Temanggung Regency 2000–2020

No	Sub-districts	Number of Industries 2010	Number of Urban Villages 2010	Number of Industries 2020	Number of Urban Villages 2020	Industrial Change Percentage 2010-2020	Percentage of Spatial Change in Urban Village 2010-2020
1	Kandangan	0	3	2	8	200%	167%
2	Kedu	1	7	1	14	0%	100%
3	Kranggan	7	0	12	7	71%	700%
4	Ngadirejo	1	5	1	10	0%	100%
5	Pringsurat	9	0	12	9	33%	900%
6	Temanggung	1	18	1	24	0%	33%

Source: GIS Calculation and Statistics Data 2000, 2020

Industrialization and urbanization change shifts the agricultural activities and housing development in rural areas, which are the main factors to drive spatial change in rural areas (Li et al., 2010). Rural land development is growing along with urbanization and industrialization, as indicated by the expansion of residential areas (Yang & Li, 2020). In addition, industrialization also accelerates economic growth and the process of transforming rural-urban relations (Liu, 2018). The industrialization has significantly impacted rural land use transition (Liu, 2018; Yang & Li, 2020; Yang et al., 2021). Similar conditions also occur in Temanggung Regency. The availability of local resources has attracted wood product manufacturing industries to operate in several villages, especially in Kranggan and Pringsurat. The development of industry, especially the wood product manufacturing industry, impacts spatial changes in rural areas. Changes in the built-up land occurred significantly in the countryside around the industrial location. These changes occurred massively from 2010 to 2020.

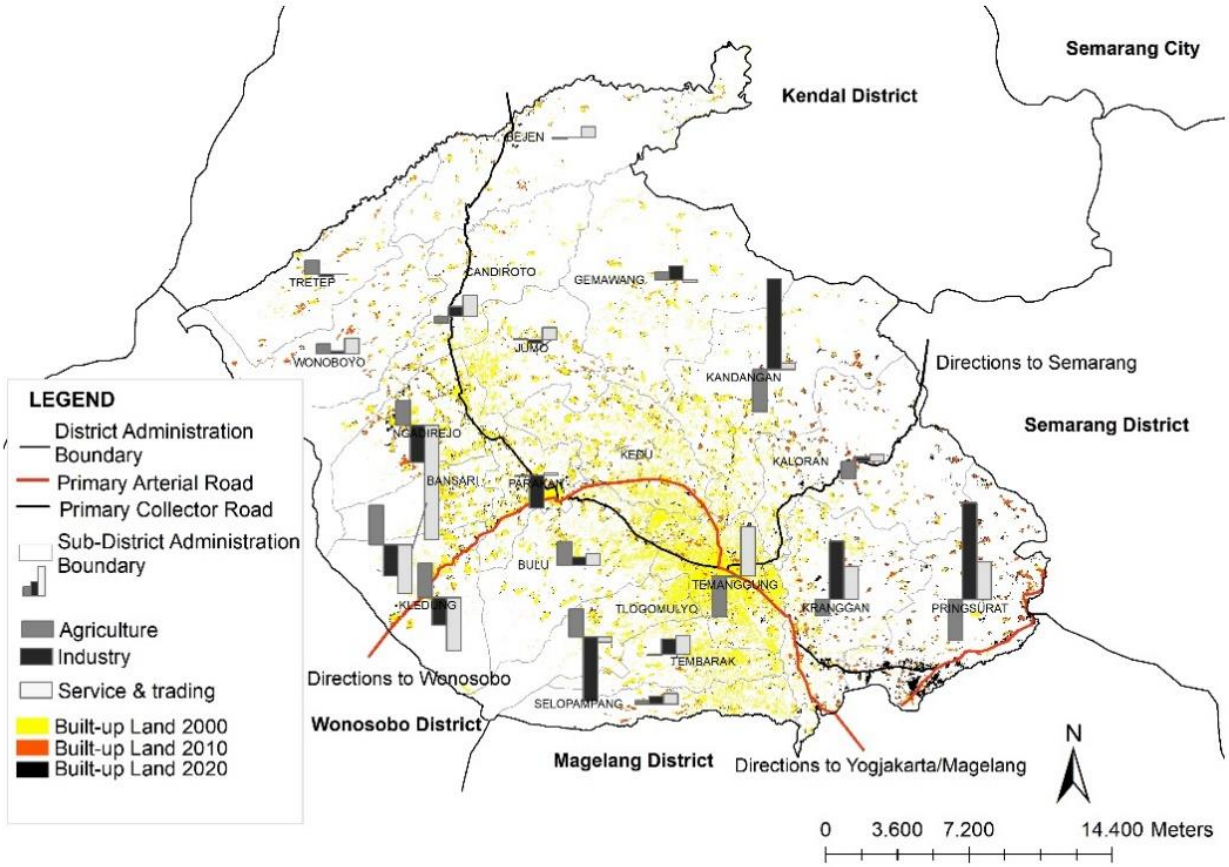
4.4. Spatial Changes

The industrial built-up area experienced rapid growth in the period 1990 - 2000, while the increased number of workers occurred more rapidly in 2000-2010, which shows that optimal production and absorption of workers in the wood processing industry occurred after the establishment of the factories. The increase in industrial workers is in line with the growth of urban employment shown by the urbanization process in this area.

The growth of industrial land also increases the development of the surrounding area of the industry, which was initially dominated by rural areas. The increasing number of industrial workers is also part of the growth of urban activities, rural industrialization in the Temanggung Regency has become an activity that promotes urbanization in the region. It specifies that the bottom-up urbanization pattern was not initially a government development strategy but rather a private business initiative. In its later development, the government then allocated the area in the southern part of the regency passed by regional roads as an industrial zone. However, it remains problematic because the factories built at the early time were partly outside of the industrial zones that were later defined in the Regency Spatial Plan.

Urban changes in Temanggung Regency are not driven by the spillover of the existing main cities. Based on data, the industrial development in the region promotes the characteristics changes of the area that was initially classified as a rural into an urban area. The phenomenon exists mainly in the Kranggan and Pringsurat sub-districts, which had massive industrial area growth in 2010-2020 with 71% and 114%, respectively. Industrial development has influenced the villages in the surrounding area to become more intense built-up

areas. This shift is due to the industrial development transforming the structure of people's livelihood from agriculture to the industrial base activity. The change in the employment structure was followed by the other employment opportunities that support the activities of the wood processing industry, both in the forward and backward production chains. The backward activities of the wood processing industry encourage sawmills and wood collection from farmers and the local timber trade. The forward activities of the wood processing industry rise to the marketing, distribution, and transportation of products and other supporting activities. These improvements are included regional developments and residential activities for workers, financial service institutions, and other service sectors. The activities of the wood processing industry in Temanggung Regency also absorb agricultural wood products from the regencies surrounding Temanggung and the Province of West Java. The fact shows that the development of the wood processing industry has also promoted the area that was initially rural into centers for collecting and producing wood product processing at the regional level.



Source: GIS Calculation and Statistics Data 2000, 2020

Figure 9. Map of Built-Up Area and Structural Employment Changes 2000-2010 in Temanggung Regency

Industrialization and urbanization that traditionally generate migration do not fully occur in the urban transition process in the rural areas of Temanggung Regency. The average annual population growth rate in Temanggung regency is around 0.96%/year, only slightly above the population growth rate of Jawa Tengah Province of 0.82%, but still below the national population growth rate of 1.4%/year in the 2010-2014 period (BPS-Statistics of Jawa Tengah Province, 2015). Temanggung Regency experiences a shift in the activities and employment structure of the local population from agriculture to industrial activities and urban production activities, which due to the regency population has been already dense and meets the needs of industrial and urban activities. Therefore, migration from outside the sub-district is more to providing skilled labor that cannot be fully provided internally, and the production activities in the border area that supported by the commuter from outside workers.

Regarding the employment and spatial change, there is a relationship between the dynamic of the workforce composition and the growth of the built-up area in Temanggung Regency (see Figure 9). The employment structure change to industry and urban activities mostly occurs in Pringsurat, Kranggan, and Kandangan Sub-Districts. The existence of a wood product manufacturing industry in the sub-district has attracted local labor, which then impacts built-up area change that indicates the reclassification existence in the area. The livelihoods shifting then have an impact on the spatial changes. The Kranggan and Pringsurat Sub-Districts area has been changed mainly in the 2010-2020 period as the location of industrial development. The changes in the employment structure and built-up area coverage of Temanggung Regency indicate the reclassification of urban growth in the rural area of Temanggung Regency. This reclassification may reflect the urban expansion as a series of changing socio-economic conditions (Jiang & O'Neill, 2018).

The rural transformation in the Temanggung Regency has statistically reclassified the villages into urban areas, which occurred functionally due to the manufacturing influence and economic growth in rural areas supported by the local resources and workforces. The growth of wood processing industrialization in the rural areas exists due to the availability of resources, workforce, and supporting infrastructure, which is also supported by marketing connectivity abroad and domestically. The change in the village employment system, which was initially based on agriculture and village businesses to become an industrial worker community, has initiated the initial stage of reclassification of villages as part of urban growth and urbanization. As Farrell (2017) suggests about the rapid urban growth triad, the reclassification may become an important option to balance the rural and urban development due to the potential of the new urban area of reclassification to take part in a strategy to hinder the rural-urban migration. This result also confirms that the reclassification can be occurred not only driven by the government initiative (National Research Council, 2003; Zhu, 2004) but also due to the occurrence of the manufacturing industry and the dynamic of the local economy in the rural area.

As the reclassification is a political administration process (Farrell, 2017; Goldstein, 1990), there is a contrast in the facts for the dual administrative and statistical classification of villages in Indonesia. From 2010 to 2020, there was no change in the administrative classification of the villages in Temanggung Regency, while in the statistical classification in this period, there were 104 villages experiencing reclassification changes (BPS-Statistics Indonesia, 2010, 2020). As the national statistics variables classification, this fact means villages have changed in urban components of population density, decreasing agriculture households, and urban facilities access. In this condition, the urban villages in Temanggung Regency are still managed with the rural administration system, which becomes a challenge in the development process, due to the absence of appropriate institution capacity and regulations dealing with socio-economy and physical urban issues.

5. Conclusion

The case of the Temanggung Regency demonstrates an initial functional reclassification of urban growth due to the shift of rural employment from the agricultural to become industrial and urban sectors. The reclassification in the case study is due mainly to the development of the wood products manufacturing industry that is supported by the availability of local workforce and resources, rather than the government institution driven.

Urbanization occurs in the existing dense village areas as part of the mega-urban regions of Java Island, where reclassification expands the urban areas in the Temanggung Regency because of a series of changes in social and economic conditions in rural areas. The growth of manufacturing factories that make wood products has transformed the rural and agricultural community and changed the livelihood and economic structure in Temanggung Regency, notably for rural areas.

The reclassification process in the rural area as part of industrialization then promoted spatial change. More built-up areas identified in the surrounding factories' agglomeration indicate the transformation of people's capacities and perspectives to develop the area. Therefore, reclassification as part of urban residual has more

impact on economic growth in people and rural areas. This urban growth process becomes part of urbanization, as reclassification adds the urban population component to the total population.

There is a dual reclassification process in which political administration is slower than the statistics process, which becomes the challenge for the urbanized rural area development due to the absence of appropriate institution capacity and regulation to deal with the socio-economic and physical growth urban issues.

The reclassification discourses are expected to become an essential part of the research agenda to deal with the current sustainable development to put the rural and urban in supportive linkages as a balance of complementary activity and spatial function.

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