Challenges on Java's small city spatial planning

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Abstract. Most Indonesians nowadays live in the urban area, due to urbanization. 60 percent of the inhabitants of Java, the most populous island in Indonesia, will live in the urban area by 2010, a figure that is higher than the national average of 55 percent. Urbanization has brought a large influx of newcomers not only into the metropolitan or large cities, but also into small and medium cities. One of urbanization’s most concerning impacts is urban sprawl that harms sustainability. There is a dearth of academic literature studying the phenomenon of urban sprawl in Indonesian small cities. Urban sprawl in small cities is commonly ignored, considered as a contained problem the solution for which is a simple use of local spatial plan. Unfortunately, for Indonesia, this solution is difficult to implement because city spatial plans works only within administrative jurisdictions, whilst the urban sprawls themselves generally occur across the borders of different administrative jurisdictions. This study studies urban sprawls occurring in several small cities in Java. While those cities already have spatial plan, most were the general spatial plan (Rencana Tata Ruang Wilayah Kota/Kabupaten) that operates only within the city’s administrative jurisdiction. We are unable to find detailed strategies in these cities to deal with urban sprawl. We also found that all spatial plans are unable to come up with urban growth boundary strategy. Finally, we are also unable to find integrated detailed spatial plan among those cities to answer the urban sprawl situation.

1. Introduction about urbanization in Java
By 2010, almost half of Indonesia’s population inhabited urban areas. By 2035, the number of Indonesians living in urban areas will have increased into being more than two-thirds of national population, according to BPS¹ projection [1]. For Java², the island where sixty percent of Indonesians live, the urbanization is higher than national. More than fifty-eight percent of Java’s inhabitants lived in the urbanized area by 2010 and it is will reach around eighty-five percent by 2035. With less than seven percent of Indonesia area, the growth of Java urban population needs to be cautiously watched. Urbanization in Java is caused by its function as central activity of Indonesia such as: economic center whereas almost sixty percent of Indonesia GDP centralized in Java by 2013 [2], prime location of higher education whereas seventy-five percent of the best Indonesia universities located in Java in 2017 [3], healthcare center whereas fifty one percent of general hospital and two-thirds of specialized hospital were located by 2013 [4], also location of armed forces major installations and headquarters.

Rapid urbanization in Java comes with rapid urban growth. Firman elucidated that urbanization in Java seems to be uncontainable now, and its growth resulted on urban expansion at various places in Java [5], which then created lots of small cities or small urban areas agglomeration. This development happened not just for areas near existing metropolitans or large cities, but also in rural areas near existing small and medium cities [6]. With urbanization, come the consequences. Rapid urban growth resulted by urbanization creates several impacts, in which the positives are usually overridden by the negatives specifically due to the uncontrolled and uncoordinated growth of the cities [7] namely as urban sprawl. Urban sprawl has a direct impact on the increase of traffic, reducing resources and cluttered the city with

¹ BPS (Biro Pusat Statistik) is Indonesia’s central bureau of statistics
² Furthermore this research will state it as Java. Java consists of 6 provinces namely Jakarta, Banten, West Java, Central Java, Jogjakarta, and East Java. Madura Island which part of East Java Province included.
built-up areas [6] which leads to uncertainty and muddling through for the future of the city [8]. The intention of tackling urban sprawl has been part of the international consensus stipulated in the New Urban Agenda (NUA) under 2016’s Quito Declaration on Habitat III Conference [9]. Understanding the negative impact of urbanization could enhance the sustainability of the cities, especially in Java, the most populated island in the world [10][11].

While there were many references regarding urban expansion about metropolitan or large cities, discourse about urban expansion in small and medium cities is relatively low. Bell and Jayne stated many urban theories based on research from metropolitan and large cities development toward their global or regional context which then neglected the uniqueness and complexity of small cities [12]. Way also expressed that small-medium cities often being neglected despite its better chance to create various productive ways of the quality of life and sustainability [13]. This study tries to understand the challenging situation faced by the spatial planning efforts in small cities in Java small cities, which deals with increasing and never-ending urbanization. Based on population and urban expansion growth, this study examine whether or not population growth and urban expansion drive urban sprawl in Java small cities. This study also relates the ability of each city spatial plan to overcome this situation.

2. Finding small city in Java

There were several definitions of the small city that often used population number as the main parameter. United Nations defined as urban areas agglomeration with fewer than 300,000 inhabitants [14], Europe Union used functional urban area term with 50,000 to 250,000 inhabitants [15], while Government of Indonesia defined as urban areas with 50,000 to 100,000 inhabitants [16]. There is drawback by only using population size to define a city because city hierarchy may differ among countries and it lacks explanation on economic function and status [12][17]. For the case of Indonesia, there are several considerations that need to be taken into account. First is how the Indonesian administrative jurisdiction rules classify districts into two categories: city (kota) for urbanized area and regency (kabupaten) for rural areas. Secondly, higher population density is often seen in villages, the smallest administrative jurisdiction (desa for rural areas and kelurahan for its urban counterparts) of the urban areas than those of rural areas. There are also several thresholds on population density for functional urban areas. European Union uses 1,500 people per km² [15] while Indonesia’s BPS uses 500 to 8500 people per km² threshold, combined with urban facilities and people occupation [16].

In this study, authors define the small city areas with urban function based on several parameters. Firstly, authors used administrative jurisdiction which is a city (kota) as the basis of selecting areas of study. By doing this, authors did not study urban areas located in regencies (kabupaten) unless that urban area is part of the selected city urban areas expansion. Secondly, this study used the combined definition of small city population threshold from UN which was between 100,000 to 300,000 inhabitants for its city core. Thirdly, we excluded cities that part of metropolitan or large city expansion because we believed that urban sprawled in these cities resulted from the effect of the larger city. By using those three parameters, we found that there were twelve small cities in Java by 2010, namely Sukabumi, Cirebon, Pekalongan, Tegal, Banjar, Salatiga, Magelang, Kediri, Probolinggo, Pasuruan, Madiun, and Blitar. We excluded two small cities due to their proximity to the large city and/or metropolitan area, they were Batu (part of Greater Malang) and Mojokerto (part of Surabaya Metropolitan Area).
3. Research methodology
This study mainly tries to identify the effect of urbanization on the small cities which are selected as an area of interest. Then authors will elaborate how their spatial plans are able to face the negative effect of urbanization. This process was done through two stages. Firstly, we analyzed urban expansion in two ways, first the growth of urban village and their population, and second by using a change of land cover during the year 2000-2010 to understand the development of built-up areas. For urban village expansion we checked urban-village growth in all twelve cities and its surrounding regencies by using village data (potensi desa) released by BPS year 2000 and year 2010. Then, we cross-referenced urban-village growth with a change of land cover to triangulate the range of real urban expansion in all twelve cities and its surrounding regencies. In our effort to associated built-up expansion with population growth, we utilized land cover data from Ministry of Forestry despite its shortfall on its scale. During these research, we were unable to obtained more detailed scale of map which had the same year with population data, therefore we opted to utilize land cover data as our source of land use analysis. These analyses were figured out in a map in order to find the course of urban expansion in all small cities. Secondly, we examined each of city/regency spatial plans (Rencana Tata Ruang Wilayah/RTRW) to find whether each urban area has developed their strategies on urban sprawl or not.

4. Urbanization in Java’s small cities
Rahayu [17] pointed out that based on population census; by 2010 there were 65% of Java urban dwellers lived in the small and medium cities. By 2010, there were twelve small cities in Java with population between 100,000 to 300,000 that are not adjacent to large city and/or metropolitan city. Three of these cities which are Sukabumi, Cirebon and Banjar located in West Java Province; four which are Tegal, Pekalongan, Salatiga and Magelang located in Central Java, and five which are Madiun, Kediri, Blitar, Pasuruan and Probolinggo located in East Java. Geographically, five of these cities are situated in the coastal areas (Cirebon, Tegal, Pekalongan, Pasuruan, and Probolinggo) while the other seven are situated in the mainland (Sukabumi, Banjar, Magelang, Salatiga, Madiun, Kediri, Blitar). According to Directorate General of Spatial Planning [19] of all cities, only Banjar formally established as kota in 2001, meanwhile, other cities has been formally recognised as kota since 1950. However, the roots of the cities itself are recognised on several Java old maps such as Chatelain maps that mentioned Tegal, Pasuruan, and Cirebon [20] and Witkamp map that mentioned Pekalongan, Magelang, Madiun, Banjar, Sukabumi, Blitar, Kediri, Probolinggo [21], we believed there were other older maps that preceded Chatelain and Witkamp maps, nevertheless those two maps sufficient enough to pointed out that many small cities in Java already established more than a centuries ago.
The growths of the small cities were supported by their good accessibility, marked by several transportation infrastructures. By 2010, national road network as the main connector had connected all small cities with other areas in Java [22]. All small cities were not connected with toll road network by 2010, however, Government Regulation [23] planned by 2029 a Trans Java toll road networks will connect most of the small cities (except for Madiun, Kediri, and Blitar). All small cities – except for Magelang and Salatiga – also connected with railway network in 2010 and by 2030 all small cities were planned to be connected by railway network [24]. From all small cities, only Cirebon had both airport and seaport facilities while the others relied on closer large cities.

Java small cities already had their specific functions as activity centres. Government Regulation [25] designated two cities (Cirebon and Salatiga) as national activity centers (pusat kegiatan nasional); nine cities (Sukabumi, Tegal, Pekalongan, Magelang, Madiun, Kediri, Blitar, Pasuruan, and Probolinggo) as regional activity centers (pusat kegiatan wilayah); and West Java Provincial Regulation [26] designated Banjar as local activity centers (pusat kegiatan lokal).

4.1 Population growth
Based on population data, all Java’s small cities experienced positive population growth and increased population density. While the number went up there was a different situation in each small city related to population growth rate. Sukabumi, Banjar, Salatiga, Blitar, Probolinggo, and Pasuruan have high growth rates (more than one percent per year) while others have low growth rates, especially for Magelang and Tegal that barely above zero growth. Compared to Java, only three cities – Sukabumi, Salatiga, and Probolinggo – surpassed Java’s urban population growth. By using same growth rate, we predict that in the next ten years Sukabumi, Cirebon, Pekalongan and Kediri will have become medium-sized cities.

In average, population density increased from 4,576 to 4,981 population/km² between the years 2000-2010 or at an annual growth rate of 0.98 percent. By 2010, the lowest density happened in Banjar due to its low number of population combined with vast urban areas (with 113.49 km², Banjar was the largest among all small cities, Kediri which next to Banjar only had around half of Banjar). Population density in seven cities, namely Sukabumi, Cirebon, Tegal, Pekalongan, Magelang, Madiun and Pasuruan were higher than average. The reason why this situation happened will be explained in the next section of this paper.

| City               | Land Area (Km²) | Population | Growth (%) | Density (pop/km²) |
|--------------------|----------------|------------|------------|-------------------|
| Sukabumi          | 48.42          | 252,420    | 18.3       | 5213              |
| Cirebon           | 37.54          | 272,263    | 8.9        | 7253              |
| Banjar            | 113.49         | 156,555    | 11.9       | 1379              |
| Tegal             | 39             | 235,443    | 1.8        | 6037              |
| Pekalongan        | 45.25          | 261,308    | 7.7        | 5775              |
| Salatiga          | 56             | 144,788    | 17.6       | 5936              |
| Magelang          | 18.12          | 115,271    | 2.6        | 3857              |
| Madiun            | 33.29          | 163,956    | 4.3        | 4925              |
| Kediri            | 63.40          | 244,519    | 9.8        | 3857              |
| Blitar            | 35.27          | 119,372    | 10.6       | 3385              |
| Probolinggo       | 56.67          | 191,522    | 13.3       | 3380              |
| Pasuruan          | 35.29          | 168,323    | 10.7       | 4770              |
4.2 Urban village expansion

In this study, we categorized urban village in small cities into two parts which are urban village located in core area and urban village located in extended area. Core area itself defined as the selected small cities based on administrative jurisdiction which has already stated on table 1. Meanwhile extended area is part of the kabupaten that is located adjacent or directly influenced by the core area. In addition there were some villages in the city core that not yet became urban village, however this study included them as the urban village.

Our analysis found that all of the cities expanded towards their surrounding area. The number of the extended urban village varied among the cities but mostly they are almost the same number as the urban village in the city core (see table 2). Based on the urban village expansion analysis, we found only Banjar and Salatiga have a low number of urban villages in the extended areas compared to in the core areas. On the contrary, a number of cities have more urban villages in the extended areas than in their core areas. These cities are Cirebon, Tegal, Pekalongan, Kediri and Blitar. The expansion is mostly linear, following the road network (see figure 2).

| City      | Core | Extended | Total | Core | Extended | Total | Growth | Extended Areas (Regency) |
|-----------|------|----------|-------|------|----------|-------|--------|--------------------------|
| Sukabumi  | 33   | 19       | 52    | 33   | 46       | 79    | 27     | Sukabumi                 |
| Cirebon   | 22   | 6        | 28    | 22   | 165      | 187   | 159    | Cirebon                  |
| Banjar    | 25   | 1        | 26    | 4    | 29       | 3     | 3      | Ciamis and Cilacap       |
| Tegal     | 27   | 155      | 182   | 27   | 160      | 187   | 5      | Tegal and Brebes         |
| Pekalongan| 47   | 53       | 100   | 47   | 82       | 129   | 29     | Pekalongan and Batang    |
| Salatiga  | 22   | 4        | 26    | 22   | 8        | 30    | 4      | Semarang                 |
| Magelang  | 17   | 24       | 41    | 17   | 29       | 46    | 5      | Magelang                 |
| Madiun    | 27   | 17       | 44    | 27   | 21       | 48    | 4      | Madiun                   |
| Kediri    | 47   | 48       | 95    | 47   | 76       | 123   | 28     | Kediri                   |
| Blitar    | 21   | 34       | 55    | 21   | 47       | 68    | 13     | Blitar                   |
| Probolinggo| 29 | 10      | 39    | 29   | 12      | 41    | 2      | Probolinggo              |
| Pasuruan  | 34   | 20       | 54    | 34   | 22       | 56    | 2      | Pasuruan                 |

Figure 2. Urban village expansion in Java’s small city [28][29]
Using *Potensi Desa* data we found that between years 2000-2010 there are significant increase of urban village number. In a decade, 165 villages morphed into urban village, an increase of 19.2 percent (see table 2). The data revealed that based on number of urban village, small cities in Java mostly are expanded.

Some cities experienced high growth of urban village expansion. Cirebon, for example, increased very large number of urban village that made Cirebon five times bigger, followed by Sukabumi and Pekalongan. Cirebon and Pekalongan, together with Tegal, are geographically located on the northern coastline of Java and are connected in one corridor. These areas are strategically located at the central nexus of Java road network, which positions them as the main transit area for Java transportation system. Nevertheless, for Tegal we found that its urban expansion was not as impressive as Cirebon and Pekalongan because Tegal already expanded in 2000. The expansion of Cirebon was also supported by its function as a location of Indonesia’s main port with roots as far as since Dutch colonization era [17][30]. For the case of Sukabumi, Andrea stated that urban area expansion in Sukabumi happened due to its location as the hub between Jakarta Metropolitan Region and its hinterland [31]. Handayani elucidated that cities expansion in Central Java happened pushed by industrialization that happened in those cities [32].

### 4.3 Population dynamics on small city extended area

Following our analysis on urban village expansion, we also looked at the population dynamics in Java’s small cities. Table 1 exhibited number of population on small city based on administrative jurisdiction as core city areas. However when we combined with the number of population in extended areas we discovered several interesting findings (see Table 3), they are:

- In general, the idea of small city on the selected twelve cities dissipated when we analyzed them as extended urban areas by using combined data of population in core and extended area;
- **Sukabumi** is not a small city. In 2000, Sukabumi had already become a large city with more than 400,000 inhabitants and continued to grow into a large city. In 2010, Sukabumi has more than 640,000 inhabitants;
- **Cirebon** is an interesting case in which a small city transformed into metropolitan. In 2000, Cirebon and its urban extended area was still considered a small city with less than 300,000 inhabitants. However, by 2010, Cirebon had become a metropolitan with 1.2 million inhabitants living in its urban extended areas;
- **Banjar** was a small city. With less than 200,000 inhabitants by 2010 we confirmed that Banjar was a small city. Population expansion was relatively low, and growth in core area was almost the same as the extended areas;
- **Tegal** was not a small city. In 2000 Tegal extended urban area had already became a metropolitan with 1.1 million inhabitants. Tegal was still a metropolitan in 2010 with less than 1.2 million inhabitants, however their population growth was low compared with other cities;
- **Pekalongan** was not a small city. Started as small city in 2000 with 227,000 inhabitants, Pekalongan growth tripled into a large city in 2010 with 673,000 inhabitants;
- **Salatiga** was a small city. In 2010, inhabitants of Salatiga urban expanded areas was 201,000 inhabitants, a little increase compared to having 167,000 inhabitants in 2000;
- **Magelang** was a small city geared to medium-sized city. With 209,000 inhabitants lives in its urban extended areas in 2000, Magelang grew into early medium-sized city in 2010 with 301,000 inhabitants;
- **Madiun** was a small city. Likely as Salatiga, population growth in Madiun is relatively low. Therefore, by 2010, its population was around 261,000 inhabitants;
- **Kediri** was not a small city. In 2000, Kediri had already become a medium-sized city. It became a large city in 2010 when it amassed 619,000 inhabitants;
- **Blitar** was another example of a small city morphing into a medium-sized city. With 270,000 inhabitants by the year 2000, Blitar continuously growth into medium-sized city with 338,000 inhabitants;
• **Probolinggo** was a small city. Though Probolinggo almost doubled its population between the year 2000-2010, Probolinggo still categorized as small city with population of 271,000 inhabitants; and
• **Pasuruan** was a small city. Pasuruan was the city with lowest population growth among other twelve cities. On a decade, Pasuruan population ‘only’ growth with less than 20,000 inhabitants and made Pasuruan a small city with 242,000 inhabitants in 2010.

Table 3. Population expansion in Java’s small city, 2000-2010 [28][29]

| City   | 2000 Core | 2000 Extension | 2000 Total | 2010 Core | 2010 Extension | 2010 Total | Remarks     |
|--------|-----------|----------------|------------|-----------|----------------|------------|-------------|
| Sukabumi | 252,420   | 151,723        | 404,143    | 324,369   | 641,050        | Large City |
| Cirebon  | 272,263   | 24,453         | 296,716    | 909,590   | 1,205,979      | Metropolitan |
| Banjar   | 156,555   | 5,917          | 162,472    | 23,732    | 198,899        | Small City  |
| Tegal    | 235,443   | 874,050        | 1,110,950  | 1,178,610 | Metropolitan |
| Pekalongan | 261,308  | 56,732         | 227,675    | 392,243   | 673,677        | Large City  |
| Salatiga | 144,788   | 16,007         | 167,445    | 201,188   | Small City     |
| Magelang | 115,271   | 146,064        | 261,335    | 301,255   | Medium City    |
| Madiun   | 163,840   | 69,941         | 233,781    | 261,552   | Small City     |
| Kediri   | 244,519   | 210,243        | 454,762    | 619,953   | Large City     |
| Blitar   | 119,372   | 155,647        | 275,019    | 238,210   | Medium City    |
| Probolinggo | 191,522  | 41,204         | 232,726    | 271,379   | Small City     |
| Pasuruan | 168,323   | 56,732         | 225,055    | 242,245   | Small City     |

By analyzing population based on urban extended areas, not all of twelve cities classified as small cities in Table 1 are, in actuality, small cities. Based on population expansion depicted in Table 3, we found that only five cities in Java are able to be properly categorized as small city: Salatiga, Madiun, Probolinggo and Pasuruan.

4.4 **Built-up Expansion**

In this section, we will explain how population development in small cities also influenced space. Based on land cover data on the 2000-2010, we found that there were relatively low built-up development (under 1 percent growth in a decade) in Cirebon, Banjar, Tegal, Pekalongan, Salatiga, Magelang, Madiun, Kediri, and Blitar. We believe that cities with already more than 50 percent built-up areas (Cirebon, Tegal, Pekalongan, Salatiga, Magelang, Madiun, Kediri, and Blitar) had already met their geographical landscape threshold, therefore unable to expand their built-up areas inside their jurisdiction areas. This situation answers why population growth in core areas of the small cities has been relatively very low: they eventually run out of space. In order to compensate the need for growth, all cities then expand outside of the core area.

Banjar is an exception. With 12.5 percent, it has a relatively low built-up area compared to other cities. Moreover, Banjar experienced a stagnation in built-up area development which occurred because its status as a new city (acquired in 2003 when it separated from Ciamis Regency) combined with its limited availability of urban facilities [32]. Meanwhile, Sukabumi, Probolinggo and Pasuruan has a low built-up area growth rate of below 6% in a decade. Despite their built-up areas growth, these city only use one-thirds of their areas for built-up area.
Table 4. Small cities built-up urban areas development (km$^2$) 2000-2010 [33][34]

| City       | Land Area (Km$^2$) | Built-up Area 2000 | Built-up Area 2010 | Change (%) |
|------------|--------------------|--------------------|--------------------|------------|
|            |                    | Area (Km$^2$)      | %                  | Area (Km$^2$) | %          |
| Sukabumi   | 48.42              | 15.05              | 31.08              | 17.78      | 36.72      | 5.64       |
| Cirebon    | 37.54              | 25.28              | 67.34              | 25.35      | 67.53      | 0.19       |
| Banjar     | 113.49             | 12.49              | 11.01              | 12.49      | 11.01      | 0.00       |
| Tegal      | 39                 | 22.77              | 58.38              | 22.77      | 58.38      | 0.00       |
| Pekalongan | 45.25              | 23.42              | 51.76              | 23.42      | 51.76      | 0.00       |
| Salatiga   | 56                 | 35.95              | 64.2               | 35.95      | 64.20      | 0.00       |
| Magelang   | 18.12              | 13.83              | 76.32              | 13.83      | 76.32      | 0.00       |
| Madiun     | 33.29              | 21.38              | 64.22              | 21.39      | 64.25      | 0.03       |
| Kediri     | 63.40              | 32.30              | 50.95              | 32.31      | 50.96      | 0.02       |
| Blitar     | 35.27              | 11.34              | 32.15              | 11.34      | 32.15      | 0.00       |
| Probolinggo| 56.67              | 15.01              | 26.49              | 17.12      | 30.21      | 3.72       |
| Pasuruan   | 35.29              | 9.84               | 27.88              | 11.18      | 31.68      | 3.80       |

A closer look at the proportion of built-up areas between core and expansion cities reveals an interesting finding. Contrary with population and urban village expansion that usually expands toward extended areas, by 2000, the development of built-up areas had been mostly concentrated in city core. However, a decade later each city has its own dynamics (see Table 5).

Table 5. Small cities expanded built-up urban areas development (km$^2$) 2000-2010 [33][34]

| City       | Core Area (km$^2$) | Expanded Area (km$^2$) | % of Core Area | Core Area (km$^2$) | Expanded Area (km$^2$) | % of Core Area |
|------------|--------------------|------------------------|----------------|--------------------|------------------------|----------------|
| Sukabumi   | 15.05              | 19.23                  | 78.26          | 17.78              | 30.97                  | 57.41          |
| Cirebon    | 25.28              | 27.04                  | 93.49          | 25.35              | 95.40                  | 26.57          |
| Banjar     | 12.49              | 12.76                  | 97.88          | 12.49              | 13.72                  | 91.03          |
| Tegal      | 22.77              | 107.09                 | 21.26          | 22.77              | 111.74                 | 20.38          |
| Pekalongan | 23.42              | 42.85                  | 54.66          | 23.42              | 56.93                  | 41.12          |
| Salatiga   | 35.95              | 42.07                  | 85.45          | 35.95              | 44.22                  | 81.30          |
| Magelang   | 13.83              | 60.84                  | 22.73          | 13.83              | 66.81                  | 20.70          |
| Madiun     | 21.38              | 28.67                  | 74.57          | 21.39              | 38.18                  | 56.02          |
| Kediri     | 32.30              | 52.97                  | 60.98          | 32.31              | 83.98                  | 38.47          |
| Blitar     | 11.34              | 15.31                  | 74.07          | 11.34              | 22.90                  | 49.52          |
| Probolinggo| 15.01              | 18.76                  | 80.01          | 17.12              | 21.38                  | 80.07          |
| Pasuruan   | 9.84               | 12.87                  | 76.46          | 11.18              | 14.47                  | 77.26          |

Tegal and Magelang exhibited cities with small proportion of built-up areas inside its the city core, and built-up development continuously expanded outside the city core due to the limited spaces inside both cities. Meanwhile, built-up development in Banjar, Salatiga, Probolinggo, and Pasuruan were still centralized in their cores with relatively low development outside of its core. Sukabumi, Pekalongan, Blitar, Madiun, and Kediri experienced urban expansion towards its expanded areas which marked with the decreased of built-up area proportion in core areas compared to the expanded urban areas in these cities. Cirebon was an interesting and different situation compare to other eleven cities. Although by 2000, most of built-up development had been concentrated in the core area of Cirebon, a decade later the opposite had been the case. By 2010, Cirebon City core areas only contributed to around 27 percent of its urban expanded built-up areas, which meant that the urban areas of Cirebon City had expanded significantly towards Cirebon Regency.
Small city in Java experienced urban expansion at a different rate. However, growth of built-up areas in extended areas of small city mostly happened near the core areas and/or along main transportation networks that have good connection with core areas (see figure 3). Based on this evidence, local governments need to be careful in dealing with urban development that spills over across the borders of adjacent administrative jurisdictions.

Figure 3. Built-up expansion in Java’s small city [33][34]

5. Spatial plan policy
Settlement development was the main reason why urban expansion occurred in the small cities of Java. Between 2000 and 2010, all of the city cores had already got their general spatial plan (Rencana Umum Tata Ruang/RUTR) defined by Law 24/1992 about Spatial Planning, formalized between late 90’s to early 2000’s (see next table). The RUTR is used as the basis of land use permit by small cities. However, due to the nature of Law 24/1992 that uses discretionary planning – especially from central government – in the name of supporting economic development, many RUTR are unable to promote sustainable development in small cities, marked by the expansion of the built-up areas for land-based investment that left not much room for open spaces. The absence of sanctions for spatial plan violations and weak enforcement in creating detailed spatial plan are also key factors as to why the RUTR fails to effectively counteract urban land expansion due to urbanization.

The multidimensional crisis in Indonesia in 1997, followed by a substantial transformation of Indonesia’s governance system, rendered Law 24/1992 as not in accordance with newly promulgated regulations [35] as well as the new format of the decentralized government [36]. Therefore, the Government of Indonesia substituted spatial planning regulation with Law 26/2007. Law 26/2007 leaned towards regulatory planning style with designated specific function to a parcel of land, replacing the discretionary style used by Law 24/1992. The new spatial planning act made all cities should replace their RUTR with the new form of the general spatial plan (RTRW). Law 26/2007 mandates that all kota and kabupaten must legalise their RTRW with district regulation (peraturan daerah/perda) in three years after 2007. Among all small cities in Java, only Probolinggo was able to comply this mandate; others needed more time (see table below) [37]. RTRW itself focuses on the development of spatial structure (struktur ruang) and only provides general guidelines for the designation of spatial pattern (pola ruang). A city needs more detailed spatial plan for spatial permit utilization [38].
Table 6. Small Cities Spatial Plan Policy [37]

| City core | RUTR (Law 24/192) | RTRW (Law 26/2007) |
|-----------|------------------|-------------------|
| Sukabumi  | 1999             | 2012              |
| Cirebon   | 1989             | 2012              |
| Banjar    | 2004             | 2014              |
| Tegal     | 2004             | 2012              |
| Pekalongan| 2003             | 2011              |
| Salatiga  | 1996             | 2011              |
| Magelang  | 1999, revised in 2001 | 2012 |
| Madiun    | 2004             | 2011              |
| Kediri    | 2002             | 2012              |
| Blitar    | No data available | 2011              |
| Probolinggo| 2000          | 2010              |
| Pasuruan  | 2002             | 2012              |

Law 26/2007 also mandates all urban areas to create a detailed spatial plan (Rencana Detail Tata Ruang/RDTR) equipped with zoning regulation. RDTR will be used as land use planning and main consideration for land use permit, creating certainty for the utilization of space in the city. Nevertheless, the creation of the RDTR itself was not an easy task. Cities need to have RTRW first, and the delayed promulgation of RTRW hampered the RDTR creation on small cities. Between 2007 and 2010, no RDTR were promulgated. Directorate General of Spatial Planning (2017) reporting that small cities in Java being overwhelmed in preparing the RDTR. None from all small cities and their counterpart regencies a part of the urban expansion in this study promulgated their RDTR and zoning regulation documents into district regulation [39]. One exception is Central Java Province, which promulgated Provincial Regulation 6/2015 regulating urban development in the Brebes-Tegal-Slawi-Pemalang urban areas corridor. With the absence of the RDTR and zoning regulation as urban development tools, authors worry that Java’s small cities will continue to expand without any regard to their urban sustainability.

6. Concluding remarks

Urbanization has been criticized as being the main culprit behind urban sprawls in Indonesia. This study reveals and emphasizes that urban sprawl is not only a phenomenon in large and metropolitan cities but also in small cities. Expansion of small cities beyond its core city leads to extended urban areas. By looking at the urban expansion data we found that a small city defined by its administrative jurisdiction is not in actuality small. We found that a city is small only as far as its core goes and when combined with its population growth and built-up area development could very easily become metropolitan cities (Cirebon and Tegal), large cities (Sukabumi, Kediri, and Pekalongan) or medium-sized cities (Magelang and Blitar) because its built-up expansion occurs around the core.

We also found that existing city spatial plans are not able to deal with urban expansion. The existence of strict delineation on jurisdiction hampers the possibility to create an integrated spatial plan. There is a lack of political will in the local government to work together in managing their urban growth marked by very few interjurisdiction spatial plan that had been promulgated. As a result of that glacial movement by the government, it was feared that any resulting detailed spatial plan will not be able to resolve the urban sprawls already occurring in Java’s small cities.

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