

# Urban Zoning Differentiation Between City and The Hinterland Area

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## ABSTRACT

Urban areas have a strong appeal to regional development. However, the limitations of urban areas push the development towards its hinterland. Urban sprawl has exacerbated in determining the morphological boundaries between rural and urban. This study aims to examine the urban zoning in Denpasar City and its hinterland in terms of physical aspects. Explorative studies based on case studies are used to understand and illustrate differences in urban zoning in city and hinterland areas. The four sub-districts of Denpasar City as the core region and the five surrounding sub-districts were chosen purposively as the hinterland. Secondary data from institutional surveys were analyzed qualitatively. The results showed that the core region and the hinterland area was dominated by the urban fringe zone. Other findings show that there is a hinterland directly adjacent to the city area, but rural characteristics still dominate its characteristics, and there is a hinterland area that has a higher urban level than the city area. The urban zoning mapping can be the initial foundation of determining urban development policy that is synergic with the hinterland area.

**Keywords:** *Urban Zoning, Core Region, Hinterland Area, Land Use, Denpasar City*

## 1. INTRODUCTION

Urban sprawl is the phenomenon of spreading outward physical appearance of the city, which causes rural to become urban forms (Yunus, 2008). The limited land that is not following the population's needs in the city causes the area around the city to change its function to become urban gradually. In other words, the phenomenon of land conversion in the area around the city is a form of activity to provide space for the city. It was further explained that the economic factors of the community were directly related to these changes because the space needs of the community to meet their needs over time continued to increase, tending to adjust the potential conditions that exist in one place (Putryana & Marlina, 2019). The area around the city experiencing land conversion has formed a new region known as the hinterland area. The hinterland area has the characteristics of increasing high population and density, and its economic sector is dominated by non-agriculture, and awareness residents as city dwellers in the area. The proximity of the hinterland area to the city is an essential substance for understanding rural-urban linkages.

Denpasar City and its hinterland area show the relationship between rural and urban areas caused by urban sprawl. The high rate of migration in the city areas, especially towards the city of Denpasar as the heart of the Bali Provincial Capital, proves that the Denpasar City is indeed in demand by migrants.

The population of Denpasar City evidences this condition until the end of 2018 of 833,900 people, and of that number, 415,417 people were migrant (Central Bureau of Statistics of Denpasar City, 2019). The density of this population will indirectly provide a cumbersome burden for Denpasar City. This is because Denpasar City only has an area of 127.88 km<sup>2</sup>, given that the ideal capacity of Denpasar City is only 200,000 to 250,000 residents. The increasing population in the Denpasar City areas has led to an increase in the need for increased space, while urban space stays stagnant (Christiawan et al., 2020).

With the heterogeneity of community activities in Denpasar City, population density encourages urban sprawl to the hinterland area (Christiawan, 2019b). The negative impacts of urban sprawl on hinterland areas are very high in terms of environmental aspects (loss of valuable agricultural land), social (number of uncontrolled migrants), economy (consumptive lifestyle) as well as transportation problems (traffic jams and traffic accidents) (Christiawan, 2019a). The crucial negative implication of this phenomenon is the opaqueness of urban zone boundaries.

Urban zoning is the division of an urban area within a specific zone to control spatial use based on applicable regulations. The area's division aims to separate industrial and commercial allotment development areas with the allotment of settlements and other land uses. In order to determine the allotment in Denpasar City and their hinterland area,

categorization is needed based on the urban level in each area. Many previous studies only partially categorized, especially only in the hinterland area, without involving city areas as core regions (Cardoso, 2018; Sadewo, 2017; Septayana & Ariastita, 2012). This study aims to analyze the differentiation of urban zoning, both in Denpasar City as core regions and in the hinterland area. Urban zoning is further useful in determining the directives of regional development in each zone. The regional development that is in line with urban zoning contributes to the balance of rural-urban linkages.

## 2. METHOD

### 2.1. Research design

The design of this study uses an analytic survey research design (Yunus, 2010). This research object is urban zoning, while the research subjects are villages or sub-district in Denpasar City and their hinterland area. The approach in this study uses a qualitative approach, which is shown to describe and explain about urban zones in the city area and hinterland areas, by first describing and exploring the proportion of physical aspects in each region.

Denpasar City, as a research location, has four districts as the core region. Furthermore, there are five districts as a hinterland area. This research is a case study research. The population in this study are all villages/sub-districts in Denpasar City and villages/sub-districts, which border directly with the core region as a representation of the hinterland area.

### 2.2. Data Analysis

Research variables used to identify the region's typological characteristics based on physical aspects, especially the proportion of land use between agricultural land, which includes rice fields and plantations with non-agricultural land including settlements, offices, and business centers. The categorizations used in urban zoning (Yunus, 2008) are:

- 1) urban zone/CBD with 100% non-agricultural land use,
- 2) urban fringe zone with  $\geq 75\%$  proportion of non-agricultural land and  $\leq 25\%$  proportion of agricultural land,
- 3) rural-urban fringe zone with the proportion of non-agricultural land in the range of  $\geq 50\% - \leq 75\%$ , while agricultural land ranges from  $\geq 25\% - \leq 50\%$ ,
- 4) urban-rural fringe zone with agricultural land shown to be in the range  $\geq 50\% - \leq 75\%$ , while non-agricultural land ranges from  $\geq 25\% - \leq 50\%$ ,
- 5) rural fringe zone with a very dominant rural appearance, with  $\geq 75\%$  the proportion of agricultural land and  $\leq 25\%$  proportion forms of non-agricultural land use.

The determination of urban zoning based on physical aspects is used spatial analysis descriptive. Data on the proportion of land use sourced from institutional surveys are processed in the form of GIS-assisted maps and then analyzed by comparing the proportion of land use with the analysis of urban zoning in the Denpasar City and their hinterland.

## 3. RESULT AND DISCUSSION

Urban zoning differentiation is explained in detail in the spatial distribution and direction of development needs.

### 3.1. The Spatial Distribution of Urban Zoning

Land use as a physical aspect in determining urban zoning in terms of the proportion between the extent of agricultural and non-agricultural land. The proportion of land uses, as shown in Table 1.

**Table 1.** Land use proportion of Denpasar city and their hinterland

Area		Land Use (%)	
		Agriculture	Non-Agriculture
City/Core region	Village/Sub-district		
Denpasar Barat District	Padangsambian Kelod	20,2	79,8
	Pemecutan Kelod	24,3	75,7
	Dauh Puri Kauh	0,0	100,0
	Dauh Puri Klod	0,0	100,0
	Dauh Puri	0,0	100,0
	Dauh Puri Kangin		
	Pemecutan	0,0	100,0
	Tegal Harum	0,0	100,0
	Tegal Kerta	0,0	100,0
	Padangsambian	0,0	100,0
Padangsambian Kaja	0,0	100,0	
Denpasar Utara District	Pemecutan Kaja	8,9	91,1
	Dauh Puri Kaja	0,0	100,0
	Dangin Puri Kauh	0,0	100,0
	Dangin Puri Kaja	0,0	100,0
	Dangin Puri Kangin	3,5	96,5
	Tonja	0,0	100,0
	Peguyangan	4,3	95,7
	Ubung	23,1	76,9
	Ubung Kaja	7,1	92,9
	Peguyangan Kaja	26,2	73,8
Peguyangan Kangin	43,7	56,3	
Denpasar Timur District	Dangin Puri Klod	55,1	44,9
	Sumerta Klod	12,6	87,4
	Kesiman	7,1	92,9
	Kesiman Petilan	65,8	34,2
	Kesiman Kertalangu	22,6	77,4
	Sumerta	36,0	64,0
	Sumerta Kaja	4,1	95,9
	Sumerta Kauh	53,5	46,5
	Dangin Puri	1,2	98,8
	Penatih	0,0	100,0
Penatih Dangin Puri	67,0	33,0	
Denpasar Selatan District	Pemogan	82,6	17,4
	Pedungan	24,2	75,8
	Sesetan	29,5	70,5

	Serangan	5,7	94,3
	Sidakarya	15,6	84,4
	Panjer	22,6	77,4
	Renon	11,6	88,4
	Sanur Kauh	33,9	66,1
	Sanur	39,1	60,9
	Sanur Kaja	2,5	97,5
Hinterland area		20,4	79,6
Mengwi District	Sempidi	50,6	49,4
	Sading	56,5	43,5
Abiansemal District	Darmasaba	79,5	20,5
	Sibang Gede	82,7	17,3
	Jagapati	65,9	34,1
Kuta Utara District	Dalung	46,8	53,2
	Kerobokan Kaja	21,9	78,1
	Kerobokan	17,9	82,1
	Kerobokan Kelod	36,4	63,6
Kuta District	Seminyak	9,0	91,0
	Legian	23,2	76,8
	Kuta	6,8	93,2
Sukawati District	Batubulan	47,0	53,0

Table 1 shows an interesting finding that not all areas in Denpasar City are fully utilized as residential land, offices, and economic centers despite being in the city areas. There is still land that is used as agricultural activities. In other words, not all areas included in the administration of Denpasar City are urban. On the other hand, there are village areas directly adjacent to city areas that are still dominated by agricultural landforms. This fact shows the hinterland area's ability to protect its agricultural land, even though it is close to the city area. In other words, the hinterland area is not always affected by the flow of urbanization from the physical aspect.

The difference in the proportion of land uses (agricultural and non-agricultural) forms variations in urban zoning. The distribution of urban zoning in Denpasar City and its hinterland area is shown in Table 2.

**Table 2.** The urban zoning of Denpasar City and its hinterland

Area	Urban Zoning (%)				
	Urban zone/ CBD	Urban fringe zone	Rural-Urban fringe zone	Urban-Rural fringe zone	Rural fringe zone
City/Core region					
Denpasar Barat District	72,7	27,3	0,0	0	0
Denpasar Utara District	36,4	36,4	18,2	9,1	0
Denpasar Timur District	9,1	36,4	18,2	27,3	9,1
Denpasar Selatan District	0,0	70,0	30,0	0	0
Total	30,2	41,9	16,3	9,3	2,3
Hinterland area					
Mengwi District	0,0	0,0	0,0	100	0
Abiansemal District	0,0	0,0	0,0	33,3	66,7
Kuta Utara District	0,0	50,0	50,0	0	0
Kuta District	0,0	100,0	0,0	0	0
Sukawati District	0,0	0,0	100,0	0	0
Total	0,0	33,3	25,0	25	16,7

Table 2 shows the variation in the proportion of urban zones in each district, both of which play a role as the core regions and hinterland areas. The percentage of land use, agriculture, and non-agriculture used as indicators to identify urban characteristics divide the Denpasar City area and its hinterland area into four zones.

- 1) Central Business District (CBD) is an entirely urban area. The area included in this zone is only in the core region, dominated by Denpasar Barat District 72,7%. There is only one district in Denpasar City that does not have a CBD, namely Denpasar Selatan District.
- 2) The urban fringe zone is an area with the characteristics of the dominant urban level. This zone is an area that dominates the urban zone, both in Denpasar City (41.9%) and in the hinterland area (33.3%). The sub-district area with the most urban fringe zone in Denpasar City is the Denpasar Selatan District by 70%, while Kuta Utara and Kuta District are two hinterland areas that are included in the urban fringe zone.
- 3) The rural-urban fringe zone is a transitional region where urban characteristics are more significant than rural. The sub-district area in Denpasar City that mostly includes this zone is Denpasar Selatan District (30%), while Kuta Utara District and Sukawati District are two hinterland areas which are included in the rural-urban fringe zone.
- 4) The urban-rural fringe zone is a transition area where the characteristics of smaller cities. The sub-district area in Denpasar City, which mostly included this zone, was Denpasar Barat District (27.3%), while Mengwi and Abiansemal District were two hinterland areas which included in the urban-rural fringe zone.
- 5) Rural fringe zones are areas with dominant rural level characteristics. There is each one region in the core and hinterland areas that fall into this zone. The rural fringe zones in the core region are in the Denpasar Timur District (9.1%), while the hinterland areas are in two areas in the Abiansemal District (67%).

The results of urban zoning explained that the zone with the highest urban level was centered on the core region of Denpasar City. In comparison, the urban zone that dominates the Denpasar City area and the hinterland area is the urban fringe zone. An interesting finding from this study is that there is a Denpasar City area that does not have a CBD, and there are also city area that have a lower urban level, and there is even one area that is mostly dominated by rural characteristics. This finding reinforces the results of other studies that the areas included in city administration are not entirely urban (Akkoyunlu, 2015; Imelda, 2013).

In terms of the hinterland area, spatial analysis shows that not all areas bordering directly or within proximity of urban areas have regional characteristics dominated by urban

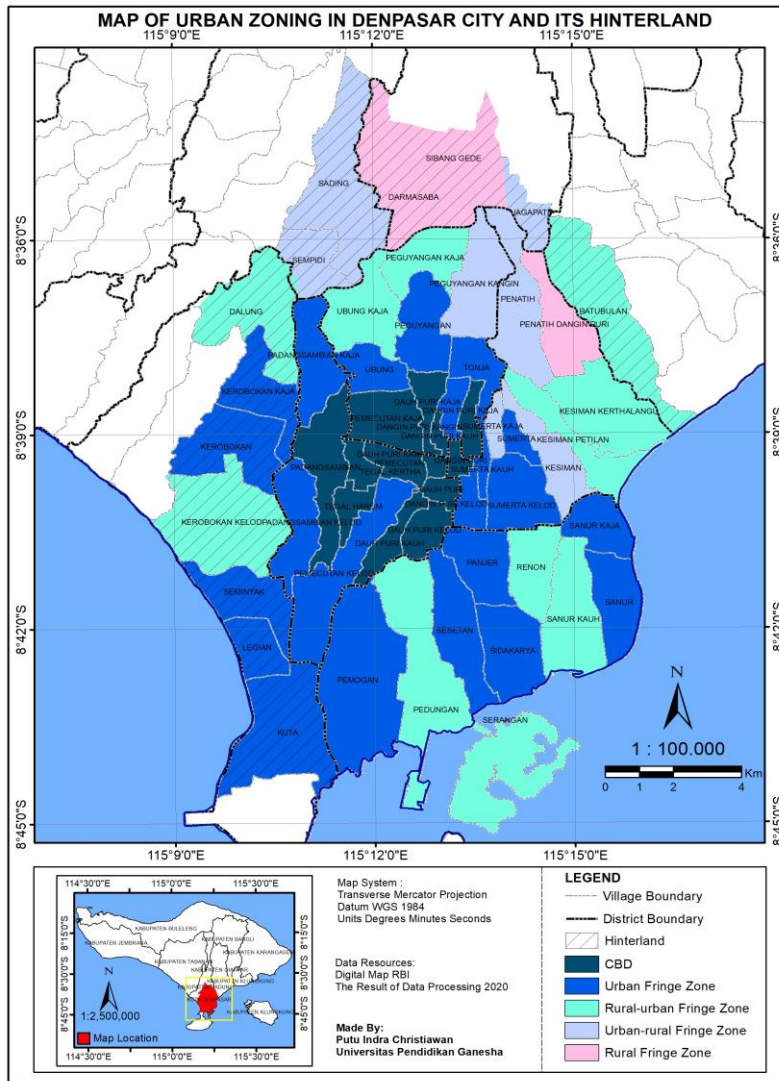
characteristics. There are two districts, namely Mengwi and Abiansemal, which border directly with the city area, but rural characteristics still dominate both. This fact is contrary to Eko & Rahayu (2012) research, which states that the closer the hinterland's location to the urban area, the higher the urban characteristics.

An unexpected finding was that hinterland areas had higher urban rates than city areas directly adjacent to them. This case occurred in the eastern part of Denpasar City, namely between Penatih Dangin Puri Village, part of Denpasar Timur District, and Batubulan Village, Sukawati District. The area within the core region with the status of a rural fringe zone is directly adjacent to the hinterland area, which belongs to the rural-urban fringe zone. This anomaly can be one evidence of the regional development gap between Denpasar City and its back

regions. The spatial expression of urban zoning in Denpasar City and its hinterland area as shown in Fig.1.

### 3.2. Directives for Regional Development in Urban Zoning

Differences in urban zoning, both within the Denpasar City area and in the hinterland area, suggest a different direction for regional development. Directives for the development of areas suitable for urban zoning are needed so that rural-urban linkages work in a balanced way. On the other hand, the direction of appropriate regional development reduces the negative impacts, both for the city and the hinterland area. The direction of regional development in each urban zoning is as follows.



**Figure 1** Map of Urban Zoning in Denpasar City and Its Hinterland

- 1) CBD, as a zone of urban activity, is the most appropriate area to develop modern trade complexes. The intended modern trade complex is an area that can accommodate the buying and selling activities of urban products.
- 2) The urban fringe zone as an area dominated by non-agricultural land is a perfect area for industrial development. The industrial estate has a strategic role in increasing the role of cities in the constellation of economic relations between urban and rural areas.
- 3) The rural-urban fringe zone is the most appropriate area to develop residential areas, especially housing. Settlement development is needed to anticipate housing needs for migrants who work in the city and urban fringe zones.
- 4) The urban-rural fringe zone is the most appropriate area to develop educational facilities. Educational development, both formal and non-formal, emphasizes specific skills expected to increase economic activity in rural areas and prepare the qualifications needed in urban areas.
- 5) The rural fringe zone as an area dominated by agricultural land is a perfect area for agricultural development, traditional markets, and green open space. Agriculture that still exists in this zone must be a priority to be protected. Agricultural output is not only to meet food needs in rural areas but is also oriented towards meeting the needs of urban residents. Agricultural products produced must be accommodated with the construction of traditional markets that are neatly arranged. In the long run, the existence of agricultural land also functions as a green open space.

The five directions for regional development adapted to urban zoning are spatial policies aimed at developing certain functions in the context of spatial optimization. On the other hand, regional development direction is also the anticipation of creating a balance of rural-urban linkages. Spatial planning that does not pay attention to the urban level of an area causes the gap between rural and urban areas to become steeper (Kasikoen, 2011; Rosmeli & Nurhayani, 2014). Wilonoyudho et al. (2017) suggest that the gap is more detrimental to rural areas.

#### **4. CONCLUSION**

Differentiation of urban zones based on the proportion of agricultural and non-agricultural land use has divided the Denpasar City and its hinterland area into four zones. The urban zoning that dominates the core region and the hinterland are the urban fringe zone. The most interesting

phenomenon is the discovery of two conditions that indirectly indicate the existence of rural-urban linkages disparity. The first phenomenon is the existence of a hinterland area that borders directly with the city area, but rural characteristics still dominate its characteristics. The second phenomenon is the existence of a hinterland area with a higher urban level than a city area directly adjacent to it. Efforts that can be made to balance rural-urban linkages are to develop areas following the characteristics of the urban zone. Developing the right region based on urban zoning will guarantee sustainable rural-urban linkages.

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