

## Review on Main Characteristic of Historical City as an Urban Design Alternative: A case study in Cakranegara City, Indonesia

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**Abstract:** The main problem of conserving old Indonesian cities is how their changes are still accepted without eliminating their main characteristics. Cakranegara is one of the old cities in which its main characteristic should be known. The grid-designed pattern of Cakranegara is an architecturally beautiful Hindu Balinese pattern with its own unique identity. The study of the main characteristic of Cakranegara was done by matching the basic principle of the social culture and religious beliefs with the empirical field data. The research adopted four methods: questionnaire, cognitive mapping, interview, and visual observations. The data of the questionnaires was analyzed by descriptive statistics, while the data of the cognitive mapping, interviews, and visual observations were analyzed qualitatively. The next was then the assessment of the design of settlement blocks, the crossroads, the urban design, the spatial orientation and hierarchy by triangulation process. Thus, the basic principle of the social culture and the religion results in the realization of the main characteristic of the historical city of Cakranegara.

### 1. INTRODUCTION

Urban design existing in Indonesia nowadays is still focused on the same forms; as a result, no more attention is given to urban design based on the variety of the social cultures. An example of this is the administrative boundaries among districts as units of the urban designs of which the socio-cultural aspects are then neglected ([Samadhi, 2004](#)).

[Wiryomartono \(1995\)](#) and [Samadhi \(2004\)](#) state that there are urban areas like *Nagari* in Padang, *Gampong* in Aceh, and *Desa Adat* in Bali having valuable social cultures, which have a close relationship with the realization of the area's values. Therefore, the building and development of historical cities should consider the character of their valuable social and cultural aspects. [Hermanislamet \(1999\)](#) states that research should be conducted towards the old historical Indonesian cities and social cultures of high values because they provide theoretical concepts as references to build urban areas.

Cakranegara, one of the old Indonesian historical cities in Lombok-East Indonesia, has a spatial specification and unique social cultures. According to [Funo \(1995\)](#), Cakranegara is a city having a grid pattern which is built in the form of settlement blocks called *Karang*. [Handinoto \(2000\)](#) says that Cakranegara is one sample of old cities which is designed based on

cosmology and has morphology as well as a specific social culture. The question is, then, how can the basic principle of the social culture and the religion provide the main characteristic of the historical city of Cakranegara?

## 2. CONTRIBUTION

The purpose of this study is to provide a new architectural and urban design theory, especially dealing with the spatial theory. It will be useful for the local government as a reference for planning and formulating the conservation of Cakranegara city. For Indonesian urban designers, the theory will become an inspiration to develop existing cities and an international reference for grids from Indonesia. For future researchers, the analysis frame of the study can be one of the alternative models for the same kind of studies either in Indonesia or in other countries.

## 3. THE HISTORY OF CAKRANEGARA CITY

Cakranegara was founded historically in a long process in Bali from the beginning of the existence of the *Gel-Gel* kingdoms. In the 15th century, the *Gel-Gel* regime colonized Lombok, Sumbawa, and Blambangan (East Java) reigned by *Dalem Watu Renggong*. After his death, his reign was moved to Karangasem at the northern part of the *Gel-Gel* kingdoms. The height of his glory ended after the fourth king of Karangasem. One of his princes, I Gusti Anglurah Ketut Karangasem, enlarged his colony to Lombok (Cakranegara) around 1692. [De Graaf \(1941\)](#) thought that the ruin of *Gel-Gel* coincided with the colony of Karangasem to the island of Lombok. The conquer of Karangasem Bali over Lombok was due to the unpleasant political situation between two powerful kingdoms in Lombok, Selaparang in East Lombok and Pejanggik in Central Lombok.

Kings Karangasem took this opportunity to conquer the island of Lombok and to found the small kingdoms in west Lombok like: Kediri, Sengkongo, Pagutan, Pagesangan, Mataram and Singasari. After Lombok was conquered from 1692 to 1740, at the site that was called Singasari, now called Cakranegara meaning a settlement city in a rounded shape; *Cakra* means 'circle' in Sanskrit and *negara* means city, settlement, or country ([Agung, 1992](#)).

## 4. THEORETICAL BACKGROUND

### 4.1 The Basic Principles of the Social and Religious Cultures of the Balinese Hinduism

#### 4.1.1 The principle of Asta Dikpalaka

[Munandar \(2005\)](#) states that Hindu civilization in the names of the gods who occupy the throne on the eight directions of the compass are called *Asta Dikpalaka*. *Asta Dikpalaka*, who in myth are said to surround Mount Mahameru. From Mount Mahameru its aspects are: the north - *dewa Kumera*, the northeast - *dewa Isana/Candra*, the east - *dewa Indra*, the southeast - *dewa Agni*, the south - *dewa Yama*, the southwest - *dewa Nirtti/Surya*, the west - *dewa Waruma*, and the northwest - *dewa Wayu*.

The eight gods of *Asta Dikpalaka* are worshiped as *dewa Kuwera* who is the god of prosperity who guards the north of the compass, *dewa Isana* is the other name of *dewa Syiwa* who guards the northeast of the compass, *Isana* or *dewa Syiwa* who is the god of mortality who is the highest god in *Trimurti*, *dewa Indra* who was worshiped as the god of war in the *Weda* era and is considered as the king of the gods who guards the east compass, *dewa Agni* who is worshiped as the god of fire who guards the southeast compass, *dewa Yama* who is the god of mortality who guards the south compass and, *dewa Surya* who is the god of the sun. The position of *dewa Surya* in the southwest compass is reflected by *dewa Nirtti* (the god of grief). When the corner of the southwest is guarded by *dewa Surya*, the corner of the northeast is guarded by *Chandra (Soma)*; but when the southwest is guarded by *dewa Nirtti*, the northeast is guarded by *Isana*. *Dewa Waruna* who is worshiped as the god of the sea who guards the west, and *dewa Wayu* is worshiped as the god of the wind who guards the northwest of the compass.

#### 4.1.2 The principle of Rwa Bhinneda

The universe is created in balance systematically. There is a basic principle to maintaining balance in the system, that is, the concept of being in couples. [Aminuddin \(1999\)](#) says that there would not be any meaningful life if there were just one species occupying the universe and dominating this cosmos. That is the reason God has created human beings and other creatures living in couples naturally. This concept makes the universe with its life perfect and beautiful. According to [Aminuddin \(1999\)](#), the first harmonious couple is a man and woman as spouses. The second couple is of the organs of a body in pairs like, the eyes, the feet, and the hands. The third thing is of life: rich-poor, righteousness-evil, and mortality-immortality. The fourth thing is of physical nature: the land-the sea, the highs-the lows, the rain-the hot, and the day-the night.

The couple system stated by [Aminuddin \(1999\)](#) has the same significance as binary opposition written by [Levi-Strauss \(1969\)](#) in Totemism. He defines the coupling of different sexes as a method to analyze the social phenomena whose way of thinking comes from the human classification of the environmental world. [Levi-Strauss \(1969\)](#) has the same opinion about classification based on different characteristics.

Hindu people in Bali, for example, think that the couple system in the universe is a consistent order of the cosmos. They are oriented in a balance and keep the harmonious relation between the universe as *macro-cosmos* and the human beings as *micro-cosmos*. This order is based on the philosophy of reconciliation of the two poles, of which the values are different, but tied in relation, either, among the objects, man with objects or man with other living things as well as man with his God ([Rahardjo \(1989\)](#); [Budihardjo \(1991\)](#)).

The philosophy of reconciliation has significance related to the social belief of Bali Hinduism to God, the Almighty ([Pidarta \(2000\)](#); [Sudharta and Atmaja \(2005\)](#)); [Suwena \(2003\)](#) says that the philosophy of reconciliation for the Balinese Hinduism is called the principle of *Rwa Bhinneda*. *Rwa* means two and *Bhinneda* means different. The principle of *Rwa Bhinneda* is reflected in the orientation order: the mountain-the sea, dirty-clean, *luan-teben*, *sekala-niskala*, and sacred-profane ([Parimin \(1986\)](#); [Gelebet \(1986\)](#); [Widana \(2002\)](#)).

[Parimin \(1986\)](#), [Mantra \(1988\)](#), [Budihardjo \(1991\)](#), and [Widana \(2002\)](#) state that the implementation of *Rwa Bhinneda* principles into spatial orientation is the sacred directioning of a mountain that is centered with an

orientation of high value and genesis. On the other hand, things which are not sacred are directed to the sea. The sea comprises bad values and, therefore, it connotes dirty things. According to [Parimin \(1986\)](#), [Gelebet \(1986\)](#), [Budihardjo \(1991\)](#), [Samadhi \(2001\)](#), [Geriya \(2004\)](#), and [Eiseman \(2005\)](#), binary opposition is physically implemented in the spatial pattern of a city, village, settlement, or house yard. Ardi shows the *Puseh* temple and *Desa* temple are situated towards the mountain; whereas the *Dalem* temple (the temple related to mortality and graveyards) are situated towards the sea.

#### 4.1.3 The principle of Sekala - niskala

*Sekala* is a visible object, whereas *niskala* is an invisible one. Both are supernatural. Balinese Hinduism thinks that the invisible objects belonging to the supernatural are realized as real objects in order that man is directly able to contact with them ([Suparman \(2003\)](#); [Soeka \(2004\)](#)). Furthermore, [Suparman \(2003\)](#) adds that the temple is a place for worship to God that is a *sekala*, that is, a reflection of *niskala*. [Eiseman \(2005\)](#) states that dances (*sekala*), which are acted out in Balinese Hinduism, are the symbols of invisible powers (*niskala*).

[Suparman \(2003\)](#) and [Soeka \(2004\)](#) state that the highest power in the universe is just God. The power of God is classified into three kinds: the power to create, to care for, and to return to Him. Basically, God is unseen and untouchable. Balinese Hinduism is anxious to be able to contact directly with God in God's real form (*sekala*). Therefore, they reflect God's character in the form of *dewa* (God). God creates *dewa* from the light and becomes his envoy ([Puja \(1985\)](#)). The purpose of transforming God to be real (*sekala*) is to make it easy to relate their thoughts to God.

According to the people of Balinese Hinduism, there are three kinds of *dewa* named after *Tri Murti*: *dewa Brahma*, *dewa Wisnu*, and *dewa Syiwa*. *Dewa* is immortal and has different tasks from other creatures. According to [Suparman \(2003\)](#) and [Soeka \(2004\)](#), the three *dewas* are uttered in one word, that is *AUM*. "A" means *Agni* (fire, the symbol of *Brahma*), "U" means *Uddaka* (water, the symbol of *Wisnu*), and "M" means *Maruta* (wind, the symbol of *Syiwa*). The tasks of the three *dewas* are: *Dewa Brahma* creates all creatures in the universe. He is given a throne in the form of *sekala* (*Desa* temple). *Dewa Wisnu* is the transformation of the power of God whose task is to maintain the universe with regard to human welfare, happiness, the life of animals, and plants; his throne is *Puseh* temple. *Dewa Syiwa* is the transformation of the power of God whose task is to return all the shapes to their origins. *Dewa Syiwa* has the power of life duration to end all the life of growth and creatures., he is given a throne in the form of *sekala* (*Dalem* temple).

#### 4.1.4 The principle of tri Hita Kharana

*Tri Hita Kharana* comes from three words. *Tri* means three; *Hita* means righteousness; and *Kharana* means source, so the *Tri Hita Kharana* consists of the righteousness. *Tri Hita Kharana* has the teaching of philosophy about adaptable and harmonious living in all aspects of life. According to [Monografi \(1985\)](#), [Kaler \(1994\)](#), and [Putra in Atmaja \(2003\)](#), the three sources provide the relationship between human beings with their God, among the humans and the humans with their environment.

According to [Gelebet \(1986\)](#), the three elements of *Tri Hita Kharana* are *atma*, *khaya*, and *angga* (soul/spirit, energy, and physical/body). [Dharmayudha and Cantika \(1999\)](#) say that the *Tri Hita Kharana* are *atman*,

*prana*, and *sarira* (Table 1). The three points as the source of life are soul/spirit, energy, and physical/body. Man with his life can take an important, high role in his life if his life is in balance. According to [Patra \(1992\)](#), [Gorda \(1996\)](#), [Atmaja \(1999\)](#), and [Samadhi \(2001\)](#), spatial patterns adopting the principle of *Tri Hita Kharana* can be seen in the form of *Parahyangan*, that is, the site of worship for the spirit. *Pawongan* is when the people living in an area are an energy, and *Palemahan* is the territorial form which functions physically.

Table 1. The Elements of Tri Hita Kharana

Tri Hita Kharana	SOUL/SPIRIT ( <i>atma</i> )	ENERGY ( <i>prana</i> )	PHYSICAL/BODY ( <i>sarira</i> )
Universe	<i>Paraatman</i>	Power to move the universe, e.g. planetary movement	<i>Panca Maha Bhuta</i> elements
City/village/ <i>desa adat</i>	<i>Tri Kahyangan or Parahyangan</i>	<i>Sima karma or Pawongan or</i> dwellers/villagers and their activities	<i>Palemahan or</i> settlement/village territory
House	House temple	House dwellers	Dwelling unit with its yards
Human being	Soul/spirit	Energy	Physical/Body

([Source: Gelebet \(1986\)](#); [Dharmayudha and Cantika \(1999\)](#); [Patra \(1992\)](#); [Gorda \(1996\)](#); [Atmaja \(1999\)](#); and [Samadhi \(2001\)](#))

#### 4.1.5 The principle of Tri Angga, Tri Mandala, Tri Loka

Basic philosophical culture and religion are the source of the rules of *Tri Angga*, *Tri Mandala*, and *Tri Loka*. *Tri Angga* means three levels of values in an object; *Tri Mandala* means three levels of values in a space; and *Tri Loka* means three levels of values in the universe. All of these values are termed *utama*, *madya*, *nista*. When three levels of value are applied to the universe, they are the atmosphere (*Shuahloka*), the lithosphere (*Bhuahloka*), and the hydrosphere (*Bhurloka*). On Earth, they are mountain, continent, and sea. In cities, they are temples, settlement area, and graveyard. For human beings, they are head, body, and legs ([Samadhi \(2004\)](#)). When the terms *utama*, *madya*, *nista* are used in an area, there will be three spacious values called *Tri Mandala*. *Tri* means three; *Mandala* means square or space ([Atmaja \(2003\)](#)). When studied more deeply, the principle of *Tri Mandala* is the development of *Rwa Bhinneda*, that is, the existence of the east, the west and the mountains and the sea ([Parimin \(1986\)](#); [Budihardjo \(1991\)](#)). If two kinds of power are exposed, there will be a value in between called *madya*.

## 5. METHODOLOGY

The methodology adopted to describe the content of the article is based on the relevant study. According to [Shuhana \(1997\)](#), there are two main kinds of methodology in conducting a research about historical urban areas, qualitative and quantitative methodologies. Quantitative methodology uses the questionnaire method, whereas qualitative methodology is based on a field study. According to [Festinger and Katz \(1953\)](#), the difference of both methodologies is in the evaluation. The questionnaire method is broader whereas the field study method is more complete. The adoption of both methodologies will result in more accurate information.

[Shuhana \(1997\)](#) adds that the study of a historical urban area cannot be conducted just by adopting one certain methodology for its specific characteristics. [Bell and Greene \(1990\)](#) assert that an urban study should be

conducted by various kinds of method, and then triangulated to find the more accurate result.

Both methodologies are the basic methods in this study of Cakranegara, the historical city. The use of the quantitative method involves the people's evaluation of the environment of the city ([Salim \(1992\)](#); [Shuhana \(1997\)](#)). [Banerjee and Southworth \(ed.\) \(1990\)](#) suggest the people's experience about an environment are very useful for the researcher because they know the real situation thoroughly. Therefore, the findings of the analyzed questionnaire can represent a large number of the population, enabling this method to be used as the fundamentals of a qualitative method.

## **5.1 The Procedure of Data Collecting**

### **5.1.1 Questionnaire technique**

The distribution of the questionnaire was done by simple random sampling distributed to the blocks of the homogeneous settlement dwellers. [Sugiyono \(2009\)](#) supports this method. There were 330 respondents taken as the sample with validity of 95% and correction 5.5%. The number is based on the assumption and the validity by [De Vaus \(1991\)](#).

### **5.1.2 Cognitive Mapping Technique**

Data collecting by cognitive mapping was carried out in the Cakranegara area involving 30 respondents. This was based on [Shuhana \(1997\)](#) and [Shuhana and Ahmad \(1999\)](#). The 30 respondents consisted of the dwellers being studied and were selected based on purposely sample.

They were interviewed about the elements they remembered dealing with in Cakranegara city. The elements are considered important because they have specific values, significant and outstanding, to be compared to the other elements.

### **5.1.3 The Technique of Interview**

Data collecting by interview of the residents of Cakranegara uses a list of questions referring to the objective of the research. The respondents are classified based on their levels of education, values, norms, custom rules, and their implementation in life involving the leader of each social element.

There are 30 respondents as purposely sample. According to [Walker \(1985\)](#), 20 to 30 respondents are adequate to conduct qualitative and quantitative studies.

### **5.1.4 The Visual Observation Technique**

In visual observation activities, the researcher is just an independent observer meaning that the observer is free to observe, examine and do the measure. According to [Spreiregen \(1965\)](#), a visual observation activity is very good to know the composition, the city shape and to evaluate the potentials and the shortcomings of a city. [Shuhana and Ahmad \(1992\)](#) say that the use of technical observation to conduct a research of a historical city area has advantages especially on the effectiveness to describe the city/town thoroughly. [Shuhana and Ahmad \(2002\)](#) add that the thorough evaluation of the physical character of a city can be obtained by a visual observation and recording of the physical elements of the city. The recording of the

standardized physical city elements is important to know the design of the city.

## 5.2 The Procedure of Data Analysis

Empirical data were collected adopting four methods, namely questionnaire, cognitive mapping, interview, and visual observation, by the researcher. The questionnaire data is analyzed statistically, while cognitive mapping data, interview, and visual observation are analyzed qualitatively, then they will be triangulated. The findings of the triangulation analysis will be matched with the described theories according to the theoretical background, so that the main characteristic of the historical Cakranegara city will be discovered.

## 6. THE RESULT AND THE DISCUSSION

### 6.1 The Settlement Blocks

The respondents of the questionnaire from Cakranegara were 268 individuals, (81.2%) Hindu, 50 (15.2%) Muslim, 4 (1.2%) Buddhist, and 8 (2.4%) Christian.

According to [Wacana \(1988\)](#), [Zakaria \(1998\)](#), and [Djelenga \(2001\)](#), the blocks dwelt in by the Hindu community have been continuously existing since the seventeenth century (from the year 1692, to be precise), when the area was ruled by the Balinese Hindu kingdom of Karangasem.

The result of the observation of Cakranegara is 36 settlement blocks, which include 33 blocks dwelt in by the Hindu community in the center of the city, two blocks by the Muslim community on the southeast corner, and one block of vacant land on the southwest corner. The result of the interview with the local community found that the main sources of community income were entrepreneurship and civil servantry. The Muslim community, which inhabits the southeast corner block, comes from a long line of skin cracker producers.

The result of the observation on one block of settlement units was that they stretch in a north-south direction, and their gates face either to the east or to the west. Based on the measurement conducted by the researcher, each of the settlement units occupies a square area of, on average, 729 m<sup>2</sup>, or 27 meters on each side. The length of the road on each side of a block is 27 meters, and the length of each road that divides blocks into settlement units is 9 meters. According to [Funo \(1995\)](#) and the local community, the settlement unit in one block is divided in some levels. The smallest level, with 20 settlement units, are called *marga*. The medium level, with 40 settlement units, are called *kriang*, and the largest level, with 80 settlement units are called *karang* (*Figure 1b*).

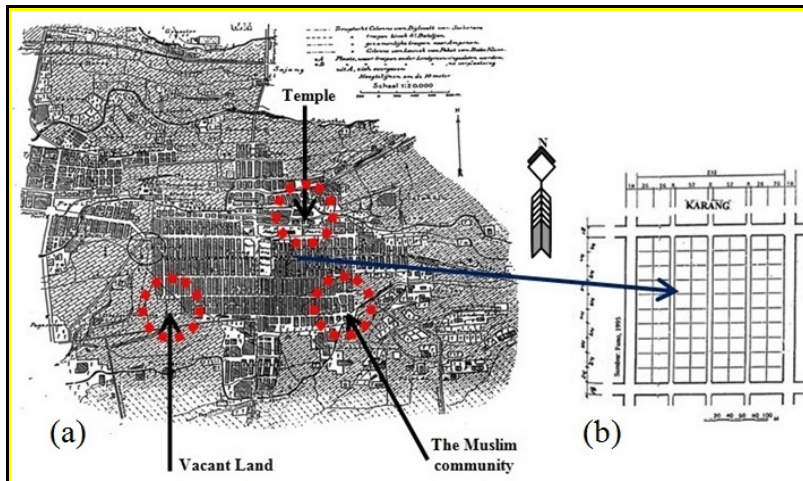


Figure 1. (a) Cakranegara City Map and (b) Settlement Blocks  
(Source: (a) Cool (1896); (b) Funo (1995))

The findings, when matched between the principal of *Asta Dikpalaka*, with the positions and functions of the settlement block in Cakranegara city, will surely show that the settlement blocks adopt the principal of *Asta Dikpalaka*. The empirical evidence is that, first, in the northeastern corner is the position of the worship block which is in accordance with the position of *dewa Isana*, which is the other name of *dewa Syiwa*. Second, at the southeast corner is the block of the Muslim community whose profession is as skin cracker producers. This is in accordance with the position of *dewa Agni* (*Agni* is fire). Fire is the main utensil to fry skin cracker. Third, at the northwest corner is the position of the block of vacant land which is in accordance with *dewa Nirtti*. *Nirtti* is the god of grief; therefore constructing settlement buildings is not allowed (Figure 1a).

## 6.2 The Crossroads

The result of the questionnaire regarding the crossroads in Cakranegara city is that 238 respondents (84.80%) out of 330 were able to explain that one of the characteristics of Cakranegara is the presence of a lot of crossroads, public temples, and settlement blocks (Table 2). The result of the cognitive mapping is that 28 respondents (93.3%) out of 30 could draw crossroads very well and clearly (Table 3). The resulting interview with the local community was that 30 respondents (100%) out of 30 revealed that Cakranegara has a lot of crossroads. Meanwhile, visual observation by the researcher registers two types of crossroads, that is, the crossroad located in the center of the city and crossroads located in settlement blocks. The crossroads at the center of the city, called *pempatan agung*, serve to accommodate city-wide and social-cultural activities and religious rituals. As for the crossroads located in settlement blocks, called *pempatan madya*, they function as the center of neighborhood-wide and social-cultural activities and religious rituals.

Prior to the processions of religious rituals, *tawur agung* in particular, offerings are arranged at the crossroad. According to Eiseman (2005), participants arrange the offerings as follows: black cloth and four sticks of *sate* (grilled chicken) are set in the north, offered to *dewa Wisnu*, to symbolize *kaja* or *apah*; red cloth and nine sticks of *sate* are set in the south, offered to *dewa Brahma*, to symbolize *kelod* or *teja*; white cloth and five sticks of *sate* are set in the east, offered to *dewa Iswara*, to symbolize *kangin* or *bayu*; yellow cloth and seven sticks of *sate* are offered to *dewa*

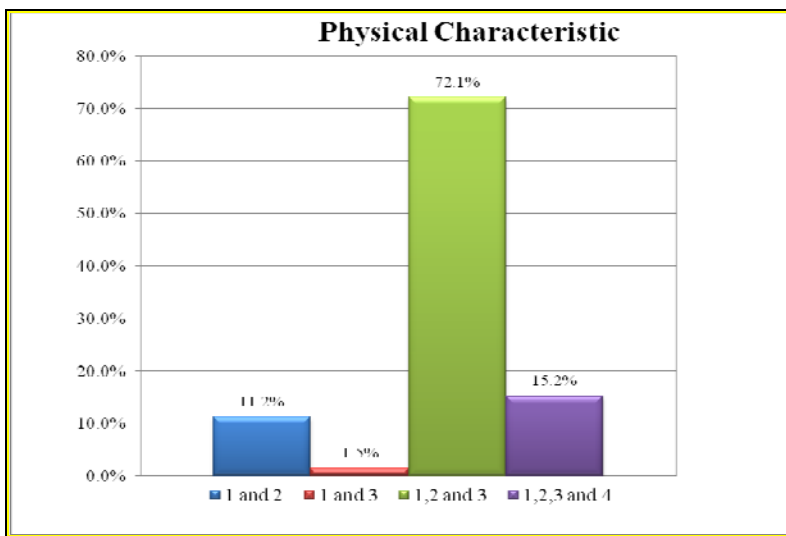


Mahadewa, to symbolize *kauh* or *pratiwi*; and gray cloth and eight sticks of *sate* are set at the center, offered to *dewa Syiwa*, to symbolize *puseh* or *akasa* (Figure 2a). Interviews with religious leaders reveal that north is the region guarded by *dewa Wisnu*, south by *dewa Brahma*, east by *dewa Iswara*, west by *dewa Mahadewa*, and center *dewa Syiwa*.

Table 2. Respondents Perception of Physical Characteristics Cakranegara City

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 and 2	37	11.2	11.2
	1 and 3	5	1.5	12.7
	1,2 and 3	238	72.1	84.8
	1,2,3 and 4	50	15.2	100.0
	Total	330	100.0	100.0
Total	330	100.0		

(Source: Mulyadi, L. (2008))



- Legend:**
1. Crossroads
  2. Temples (*Meru, Mayura, and Dalam*)
  3. Settlement Blocks
  4. Others

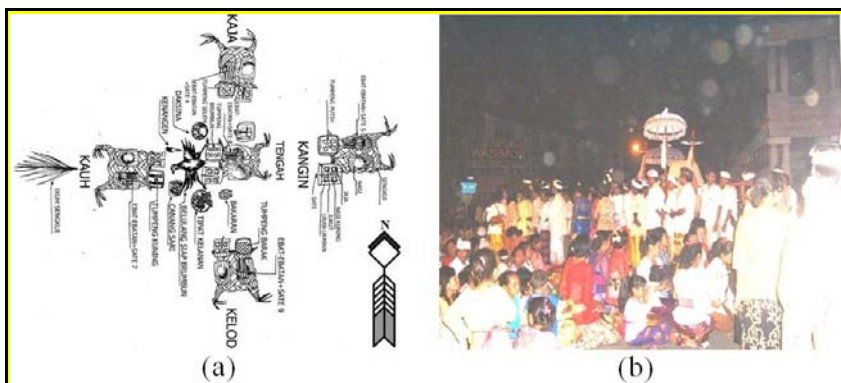


Figure 2. (a) Formation of Spatial Arrangement of Offerings at the Crossroad  
 (b) The Ritual Conditions of Tawur Agung

(Source: (a) Eiseman (2005); (b) Mulyadi (2008))

The findings, when the principle of *Panca Brahma* and the arrangement of the traditional feast are matched, and on certain crossroads, religious rituals are carried out (Figure 2b); so it will surely be found that crossroads

in Cakranegara city adopt the principal of *Panca Brahma*. The empiric evidence is that, when the traditional feast is prepared for the gods before a religious ritual, it is held at a crossroad.

### 6.3 The City Structures

The result of the visual observation by the researcher reveals that in terms of width there are four types of road in Cakranegara. First, the East-West roads (*Selaparang* and *Pejanggik* streets) are 45 meters wide. Second, the North-South roads (*Sultan Hasanuddin* and *Anak Agung Gede Ngurah* streets) are 36 meters wide. The North-South roads and East-West roads intersect as a crossroad that, according to [Funo \(1995\)](#), [Handinoto \(2000\)](#), and [Mulyadi \(2008\)](#), the local community calls *Marga Sanga*. Third, the roads that divide the settlement blocks into squares are 27 meters wide. These roads are called *Marga Dasa*. Fourth, the roads that divide the settlement blocks into rectangular sub-blocks are 9 meters wide. These roads are called *Marga* (*Figure 4*).

The result of the interview with the local community reveals that roads in this city serve to accommodate social-cultural activities and religious ceremonies, which include funeral ceremonies (*Figure 3.b*), and *mendak tirta* (*Figure 3.a*), a ritual ceremony for the taking of sacred water.



*Figure 3.* (a) The Mendak Tirta Ceremony and (b) The Funeral Ceremony  
(Source: [Mulyadi \(2008\)](#))

The result of the cognitive mapping of Cakranegara is that 29 respondents (69.7%) were able to sketch the cognitive maps of the 45 meter-wide roads, 24 respondents (80.0 %) the 27 meter-wide roads, and 14 respondents (46.7 %) the 9 meter-wide roads (*Table 3*).

According to [Funo \(1995\)](#), the grid pattern is used because of the need to divide settlement blocks called *Karang* (*Figure 1b*). The result of the interview with the local community in general reveals that the formation of the grid pattern is related to the demand to hold social activities and religious ritual ceremonies. As for the interviews with religious leaders, they reveal that the formation of the grid pattern is inseparable from the presence of crossroads, which are necessary for the Hindu community in Cakranegara because the community believes that it is in the crossroads that the power to protect an area emerge. This is in accordance with the argument shared by [Budihardjo \(1991\)](#); [Hermanislamet \(1999\)](#); and [Eiseman \(2005\)](#), that the crossroads of Hindu cities in Indonesia are sacral spots.

The findings, when matched with the principles of *Panca Brahma* and city structures, show that there will be means by which the structure of Cakranegara city adopts a grid pattern (*Figure 4*). The information related to the grid pattern found, first, the importance of a place to accommodate the social and ritual religious activities, such as the *yadnya* ritual (*Figures 3a* and *3b*), second, that in 1692 the Masehi, the immigrants who came to Bali

Island in groups from their native region, accommodated themselves in one block of settlement, and third, the belief of *niskala* power at each crossroad will provide the defense for the castle of Cakranegara city.

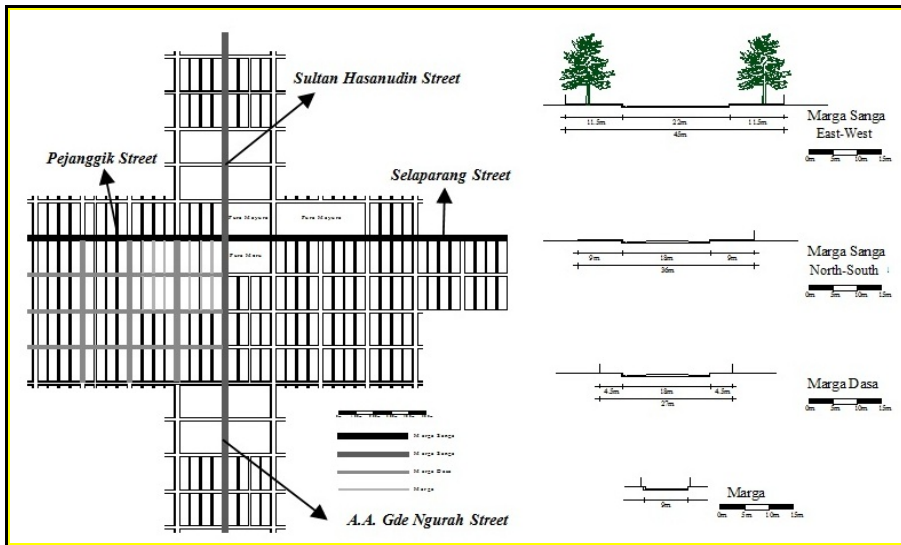


Figure 4. Street System  
(Source: Mulyadi (2008))

Table 3. Elements of the Sketches Respondents

Sketch of elements	Frequency	Responden Total	Valid Percent
Building	Meru temple	30	100.0
	Mayura temple	30	100.0
	Dalem temple	28	93.3
	Melanting temple	9	30.0
	Market of Cakranegara	28	93.3
	Market of Sindu	7	23.3
	Mataram Mall	28	93.3
	MGM Mall	27	90.0
	Mosque	6	20.0
	Crossroads	28	93.3
Street	45 m street	29	96.7
	27 m street	24	80.0
	09 m street	14	46.7
Landscape	Mayura garden	30	100.0
	Vacant land	16	53.3
	District territorial	23	76.7
District	Settlement blocks	25	83.3

(Source: Mulyadi (2008))

### 6.4 The Spatial Orientation and Hierarchy

According to Parimin (1986), Sularto (1987), and Soewarno (1990), to know the orientation and spatial hierarchies of Balinese traditional villages, a researcher should do a visual observation by checking the position of three temples (*Kahyangan Tiga*) where the inhabitants of a particular area practice their worship ritual, checking the settlement pattern of the community, and checking the territory. Meanwhile, Suwena (2003) argues that each Balinese traditional village has its own orientation and hierarchy. A researcher can find them by observing the land use and topography of the region to determine whether it is an elevated, plain, or low-lying area.

Furthermore, Parimin (1986), Sularto (1987), and Soewarno (1990) state that the orientation and hierarchy of city or traditional village area in Bali can be seen from the presence of two temples (*Desa* and *Puseh*) in the

northernmost part of the city, a temple (*Dalem*) and a graveyard in the southernmost part, and these residential area in between these two groups. Meanwhile, [Parisada Hindu Dharma \(1995\)](#) argues that the two temples that are in the northernmost part are high value because they directly face towards the mountain, and the one temple on the southernmost part is not really good because it faces towards the sea.

According to [Samadhi \(2004\)](#), city areas in Bali have the following spatial hierarchies: three temples called *Parahyangan*, the territorial border called *Palemahan*, and the dwelling community called *Pawongan*.

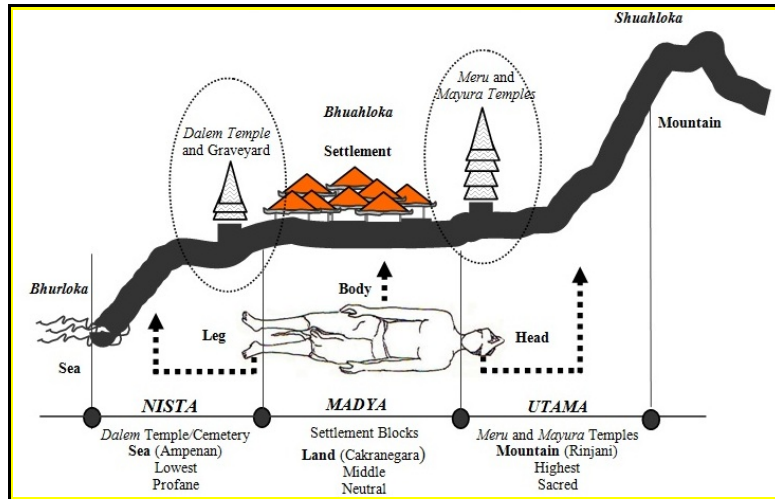


Figure 5. The Elements of Tri Angga; Tri Mandala; and Tri Loka  
(Source: Mulyadi (2008))

The result of the interviews, cognitive mapping, and the visual observation by the researcher conducted in Cakranegara city has found the presence of two temples of worship (*Meru* and *Mayura*) to the east from the central crossroad and one temple (*Dalem*) in the westernmost part of the city, distinct territorial borders, and residential dwellings in the settlement blocks.

The findings, first, when matched between the principle of *Tri Hita Kharana* and the land use in Cakranegara city, show that Cakranegara city has the spatial hierarchical principle of *Tri Hita Kharana*. There are three kinds of worship sites as the empirical evidence for this. They are the temples of *Mayura*, *Meru*, and *Dalem* as *Parahyangan*, the territory of Cakranegara city as the body (*Palemahan*), and the population of Cakranegara city as *Pawongan*. Second, when matching the principle of *Tri Angga*, *Tri Mandala*, and *Tri Loka* with land use in Cakranegara city, it was found that Cakranegara city has spatial hierarchies of those three principals. There are two kinds of worship sites as the empirical evidence for this, they are the temples of *Mayura* and *Meru* to the east from the central crossroads representing the atmosphere (*Shuahloka*) and *Utama*, and in addition, *Dalem* temple and the graveyard to the west from the central crossroads which represent the hydrosphere (*Bhurloka*) and *nista*. Meanwhile, there are settlement blocks, representing the lithosphere (*Bhuahloka*) and *madya*. Thirdly, when matching the principle of *Rwa Bhinneda* and the land use in Cakranegara city, it is shown that Cakranegara city has a spatial orientation according to that of *Rwa Bhinneda* principal. There are two kinds of worship sites as the empirical evidence for this. They are the temples of *Mayura* and *Meru* located in the east representing the direction to Mount Rinjani and the sunrise, and the one temple (*Dalam*) in the westernmost part which represents its relation to Ampenan Sea and the sunset (*Figure 5*).

## 7. CONCLUSION

Based on the discussion, it is concluded that the historical city of Cakranegara has main characteristics. First, the settlement blocks adopt the principle of *Asta Dikpalaka*. Second, the crossroads adopt the principle of *Panca Brahma*. Third, the structure of the city with a grid pattern is the adoption of: (1) the importance of a place to accommodate the social and ritual religious activities; (2) the settlement blocks to accommodate the immigranst to Bali Island in groups from their native region; and (3) the belief of *niskala* power at each crossroad. Fourth, the spatial orientation of Cakranegara city adopts the principle of *Rwa Bhinneda*, where the spatial hierarchy of Cakranegara city adopts the principle of *Tri Hita Kharana*, *Tri Angga*, *Tri Mandala*, and *Tri Loka*.

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