

THE VERIDICAL MENTAL MAPS AS AN INPUT FOR THE URBAN DESIGN PROCESS: A Case Study of the Town of Gianyar, Bali, Indonesia

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ABSTRACT

This study examines the veridicality of the mental maps of 100 residents of the town of Gianyar. In this case the veridicality measured was the level of accuracy of the Balinese worldview and cosmology captured by the mental maps. The information is useful for the urban design purposes, particularly as inputs in the maintenance of the cultural continuity of the Balinese urban environments.

Keywords: veridical mental maps, urban design, Gianyar Bali.

INTRODUCTION

The need to provide a ground in reconnecting urban design proposals with their cultural context was initiated by the need to promote the spatially expressed localism in the urban built environments as one of the elements of an urban identity. This need was largely due to the currently operative highly standardised planning system, which undermine the diversity of cultures in Indonesia (Samadhi, 2001a).

This paper was developed partly from the research of urban design as means of achieving a Balinese town with cultural identity, conducted between 1998-1999 in the town of Gianyar, Bali, Indonesia. Questionnaires and mental map sketching techniques were used to elicit the environmental knowledge particularly in relation with the Balinese worldview and cosmology. A sample of 100 individuals was selected in random from the population of four sub-districts (*kelurahan*) which constitute the center of the town. The selection of the survey areas was based upon the fact that one of the important elements of the Balinese worldview and cosmology was 'the center' which accommodated the traditional Balinese palace (*puri*) or in some cases, temple (*pura*), the square (*lapangan*), the marketplace (*pasar*) and the meeting hall (*wantilan*)¹ (see Nordholt, 1991; Samadhi, 2001b), and those sub-districts were situated around this particular place.

Each question was explained by the field surveyors as the respondents goes through the questionnaires. The questionnaires have to a certain extent captured the respondents' environmental knowledge, however some experiential knowledge about their environment can be best depicted through a mental map (see for example Lynch, 1960 and Appleyard, 1973). Thus a mental map visually depicts the experiential information which is difficult to elicit through the questionnaires.

In such an exercise, the respondents were asked to draw their version of the town of Gianyar map, including their town related cosmological knowledge. They were urged to describe as many town elements and feature as possible, which included temples, streets, buildings, places, statues, and so forth. There was no prepared base map in this activity, therefore respondents were free to express their experiential and environmental knowledge of the town of Gianyar.

The idea of this paper is to examine the produced mental maps particularly in respect to the cosmological values' representation in the drawings. As such, the people's knowledge about the everyday sociophysical environment or the content of people's cognitive representations of large-scale environments can be understood (Moore, 1983), and this information could determine the manipulation of the built environment in an urban design process (Rapoport, 1977). In this case, understanding the cosmology-sociophysical environment of Gianyar will offer an insight in the Balinese urban design process. In particular, at least, it

¹ Rapoport (1979) notes that in Indian Hindu towns, a palace, a marketplace and a square were the minimal requirements for a place to be called a town.

provides us with the characteristics of the quality of the town imageability or identity.

THE BALINESE WORLDVIEWS AND COSMOLOGIES

The discussion on the Balinese worldviews and cosmologies has been quite prolific, Swellengrebel and the Geertz in the 60s and 70s, Lansing and Barth in the 80s and 90s are among the many scholars of Bali. As such, this section offers a synthesis of the most important conceptions of space which are relevant to this paper's theme.

There are five groups of theme in the Balinese worldviews and cosmologies, they are (Samadhi, 2001a): 1) the cosmological relationships (between human and environments); 2) the cosmological space organisation; 3) the cosmological space management; 4) the cosmological meanings and symbols; and 5) the cosmological physical representation. They reflect the Balinese's attitude towards their living environments and spatial design.

The Cosmological Relationships

Relating to the Balinese Hindu psychocosmic concept, the Balinese notion of human-environment relationship is one of maintaining harmonious balance between the microcosm (human) and the macrocosm (environment). Human beings attain this balance by conducting their lives in accordance to the Balinese Hindu conceptions within the confinement of a cosmic territorial system (the *desa adat*, or literally 'customary settlement unit')² with its bounding *awig-awig desa adat* (*desa adat's* customary law). This parallelism between the microcosm and the macrocosm necessitates the practice of ritual ceremonies to maintain harmony between the world of the gods and the world of human beings.

For the Balinese, such a system is constructed around the relationship between man and environment (*palemahan*), man and God (*parahyangan*), and among men (*pawongan*), which was essentially articulated into the

philosophy of *Tri Hita Karana* or 'three causes of goodness'. Any irregularity in the cosmic order caused by the disruption of these tripartite relationships could only be interpreted as misfortunes.

The Cosmological Physical Representations

The physical representation of the Balinese cosmology is taken form of a 'centre' (*catus patha* pattern). The notion of the centre for the Balinese is one of beginning, origin. In built form it does not necessarily mean the geometric centre of a region (or a cosmic territory) but more one of an existential centre. The centre is also considered as the symbolic materialisation of the Balinese Hindu quest for cosmological balance, a special place where forces – from the first world (*bhurloka*) or third world (*swahloka*) – from all directions meet and are greeted by human beings – from the second world (*bhuwahloka*) – with religious rituals. Thus it is like the concept of 'habitabilis' (Wheatley, 1971), where a fixed point (village, town, or territory of a specific group) took its birth by being cosmicized, hence its habitation was sanctioned.

To this end, the Balinese designated a particular spatial organisation of land uses around a main crossroad – as the physical representation of the *catus patha* based centre, known as the *pampatan agung* – for the purpose of the fulfilling of such a role. On such a phenomenon, Wheatley (1971: 418) concludes:

From this point, the holy of holiest at whichever hierarchical level might occur, the four horizons were projected outwards to the cardinal points of the compass, thus assimilating the group's territory, whether tribal land, kingdom, or city, to the cosmic order, and constructing a sanctified space or *habitabilis*.

Thus, in relation to the cosmological relationship, the Balinese notion of their landscape is one of inwardness. In other words, a cosmic territory is an individual unit which, when combined with other similar units, will form a bigger settlement – which normatively and functionally called a town. In practice, however, sometimes irregularities in cultural landscapes could be found from one locale to another which can be explained as the local application of the relevant traditional-religious regulations. However, the dictum *desa mawa cara* or literally 'a settlement has its own rules' –

² For instance, a man always belongs to a *desa adat* even though he resides permanently outside this *desa adat* or even outside Bali. In such a case, he is expected to pay his due for *adat*-related rituals as well as pay homage to the village temple on the temple anniversary ceremony (*piodalan*).

addressed by any *desa adat*'s customary law—perfectly describes this phenomenon.

The Cosmological Space Organisation

The notion of spatial organisation in Balinese tradition is in accordance with the spatial continuity between the two extremes of the sacred and the profane. As such, the Balinese space – within the framework of a cosmic territory – is organised on the basis of the assigned attributes of space. The land use and settlement function configurations are the result of a worldview or local compass cardinal (*luan-teben* or upstream-downstream, *kaja-kelod* or mountainward-seaward and *kangin-kauh* or sunrise-sunset) that evolve from the translation of each local situation (*desa-kala-patra* or 'place-time-situation' dictum) into a set of principles of organisation. Such a framework can be seen as reflecting the principles of spatial division known as the *Tri Angga* (the three-fold spatial division) and the *Sanga Mandala* (the nine-fold spatial division).

The Cosmological Space Management

Referring to the cosmological relationships, the Balinese notion of cosmological space management or design is one of an effort to harmonise the relationship between human beings and their environment. In this respect the dweller of a cosmic territory – a *desa adat* – is obliged to participate in the processes of environmental design and management to ensure that his aspirations are accounted for and are in compatible relationship with others'.

The Cosmological Symbols and Meanings

The Balinese tradition is a tradition of myth and symbol. The organisation of a cosmic territory's elements configuration as a result of cosmoreligious beliefs evolves from the translation of phenomena into a symbol system. The symbol system expresses these beliefs by abstracting and translating them into principles of organisation. The organisation is seen as, for example: a) a cosmic diagram (such as in the *Sanga Mandala* spatial organisation); b) a path of life (such as in the organisation of the centre's elements and the ritual of *tawur kesanga*³); and

c) a centre of the universe (such as in the construction of the *catus patha* and its great crossroad of *pampatan agung*).

THE COSMOLOGICAL BASED TOWN FORM

The Balinese town form –including Gianyar—is in no doubt influenced by the Balinese Hindu worldviews and cosmologies (Samadhi, 2001a, 2001b). The following discussion relates the above-mentioned conceptions and the contemporary Balinese urban environments, so as to provide a cognitive description of the sociophysical environment of the Gianyarese, that is the cosmological based town form.

The cosmological relationships combined with the symbols and meanings assign the cosmological unit of *desa adat* and its elements as one of the town form determinants, in this respect the elements are the territory (*palemahan*), the triad temples of *Tri Kahyangan* (*parahyangan*) and the dwellers (*pawongan*), or in other words, the embodiment of the *Tri Hita Karana* philosophy. The *desa adat* possesses two cultural elements which define the town form. First, its *Tri Kahyangan* temples define the boundary of the cosmic as well as functional territory of a *desa adat*. In the town of Gianyar which lies to the south of Mt. Agung, the highest mountain in Bali island –thus, it is located in southern part of Bali—the *pura desa*, the village temple, marks the most northern end of its territory as a *desa adat*, while *pura dalem*, the temple of the dead, marks the southernmost end of its territory⁴. As both temples represent the most sacred and most profane areas in the territory respectively, there should be no built-up area beyond these border marks of the *desa adat* boundary. Second, its *luan-teben* or upstream-downstream spatial dichotomy designates the land uses and function locations according to the sacred-profane continuum.

The cosmological physical representation coupled with the symbols and meanings assign the *pampatan agung* or the 'great crossroad', being the center of the settlement and its elements: *puri* (traditional palace), *pampatan*

³ A ritual of village or town cleansing, conducted in conjunction with *Nyepi* –when all of the Balinese Hindu take a day of complete inactivity, thus contemplating at

home—one day before the celebration of the most important ritual of the Balinese new *Caka* year.

⁴ In the northern Bali *desa adat*, the temple of the dead marks the northernmost areas of the *desa adat*.

agung (grand crossroad), *lapangan* (plain grassy square with a number of banyan trees), as one of the town form determinants. The first element, the crossroad or *pampatan agung*, possesses a ritual role in the Balinese cosmological belief system including as the place for accommodating the essential ritual processions. The second element, the palace or *puri*, or in some cases where palace does not exist, a temple will take its place, signifies the existence of political as well as religious power over the town and its hinterlands. The third element, the square or *lapangan*, which constitutes the place for public gathering, then as a place for the king to address his disciples and now for urban activities such as sports or night bazaars.

The cosmological spatial organization combined with the symbols and meanings assign the *Sanga Mandala* principle of cosmological space division and the related conceptions of *luan-teben* dichotomy: *Tri Angga*, *kaja-kelod*, and *kangin-kauh* as one of the determinants. The *Sanga Mandala* divides the *desa adat* territory as an urban design area into nine space with different cultural-religious attributes ranging from the most sacred (the *utamaning utama* space) to the most profane (the *nistaning nista* space). Consequently, the town's land uses and function location within this cosmic territory will be determined by these principles of spatial division.

LEVEL OF VERIDICALITY

As indicated previously, a Balinese's world image normally encompasses a particular cosmic territory, that is his macrocosm. When the modernization process took place in the Balinese urban landscapes, it is obvious that some traditional-cultural environmental cues were getting weaker if not being replaced by the modern ones. As such, an observation of the utilization of traditional-cultural cues in the environmental knowing process within the modern Balinese urban setting will provide us with answers to the question of how to reconnect the urban design proposals with their cultural context.

Veridicality is a technical term used in psychology, meaning 'truthful' or 'accurate'. In the study of environmental cognition it is used to refer to mental maps which closely represent physical reality (Rapoport, 1982: 184). Such physically representative maps are veridical,

while those that register gross distortions of reality are less veridical or non-veridical. In this case, the paper measures the accuracy of the mental maps in describing the town form determinants as indicated in the previous section. As such, a veridical map will show all of the determinants, and a high level of representation of physical reality. The latter concerns the spatial-sequential quality of a mental map.

Most of the maps collected from the respondents were of spatial characteristics (62 among 100 respondents, or 62%)⁵, in which the respondents created spatially structured maps (see Figure 1). A small number of 27 % respondents sketched sequential maps where town's elements were laid sequentially along transportation lines (see Figure 2). The inferiority of the sequential maps confirms the lesser importance of the path system as structural organizer of the town of Gianyar and emphasis the importance of the cosmological spatial organization in the Balinese Hindu built environments.

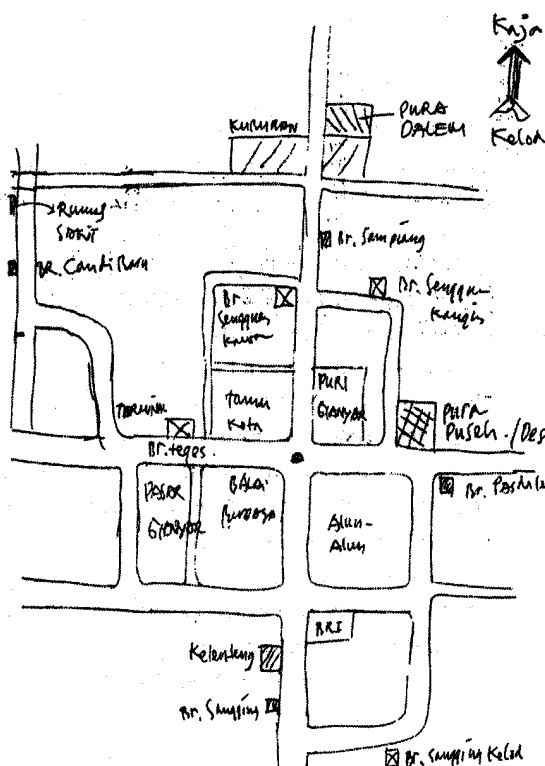


Figure 1. Example of a Spatially Structured Map

⁵ See Appleyard (1973: 185-189) or Bechtel (1997) for the discussion of spatial and sequential maps.

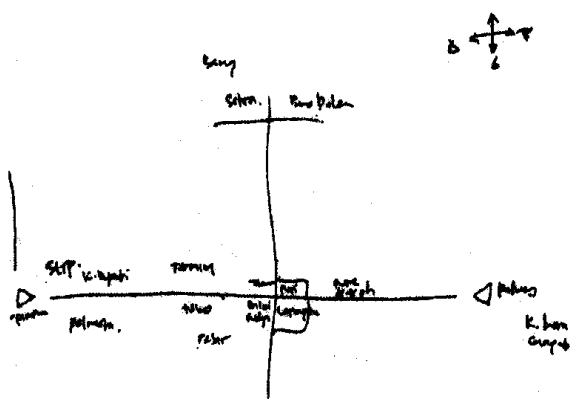


Figure 2. Example of a Sequential Map

The Desa Adat

The environmental cues to be found in the maps in regard to the cognitive aspect of the first determinant are 1) the Tri Kahyangan temples as the manifestation of the ideal relationships between man and the God (*parahyangan*) and the boundary of the cosmic territory of the *desa adat* (*palemahan*); and 2) the bale banjar or neighborhood meeting hall which considered as the manifestation of the relationships among man (*pawongan*). Some 87% and 62% of the respondents include the temples and the meeting hall respectively on their maps. Meaning that, although these Balinese urban elements as a place identity was known yet still regarded as a strong environmental cue. Thus, it is contrary to Rapoport (1981: 17) proposal that environmental cues would become less important in cases where identity is known.

The Pampatan Agung

The local cosmological space management forms a crossroad pattern of *pampatan agung* in the heart of Desa Adat Gianyar. This physical element has become a town landmark in a significant way to unconsciously force the respondents to begin their maps sketching from this point on ward. Of a hundred respondents that were participated, some 77% drew this particular crossroad and its elements on their maps, namely the palace (75%) and the square (72%). The three percentages were relatively in a similar range, which tell us that the respondents perceived them as a unity or an environmental cue.

The Sanga Mandala Principle

This principle is obviously an abstract one, hence not a cognitive feature. As such, the

Balinese traditional orientation or compass was used as a clue to the incorporation of this determinant into the maps. In this case, the presence of a *kaja-kelod* direction, which more or less coincides with the Western's north-south direction, was examined. It turns up that this indigenous worldview was quite prevalent as indicated by a large number of respondents (89%) who quoted it on their maps.

The Level of Veridicality

The subset of those three determinants represents the percentage of the veridical maps, thus the level of importance of the traditional-religious Balinese cultures in general and particularly conceptions of space in the spatial design of the urban Bali. Some 62% of the respondents produced maps which contain the three cosmological town form determinants, however, only 84% of them or 52% of the total of 100 participating respondents have a relatively high level of representation of physical reality.

Thus, only 52% of the produced mental maps can be classified as veridical. However, although only slightly above fifty percents, Gianyar and its sociophysical environments, has relatively produced significant qualities of imageability for their residents to register the town's identity. In which, such an imageability and identity was built upon Balinese-Hindu cosmological values. Thus, the environmental knowing process in the town of Gianyar is still relatively relied on the familiar environmental cues of the traditional features of the Balinese cultures.

CONCLUSION

Nonetheless, it is quite valid to claim that the Balinese cultural values, namely the traditional-religious ones, are an essential aspect in the management and design of the Balinese urban landscapes, particularly in the maintenance of the Balinese cultural continuity amid the rapid modernization led by the tourism sector. Those findings provided us with a set of information in regard to the characteristics of Gianyar's residents as members of (Balinese) cultures that need to be considered in the organization of the built environment. They also signified the environmental cognition as one of the principal

mechanisms which link people and environments⁶. The development of urban design principles and concepts of the Balinese towns, therefore, could benefit from and should take into account those town form determinants (c.f. Samadhi, 2001b). The micro land use designation, street pattern development, conservation area establishment, activity support development, are among the urban design policies that will be influenced by them. In the end, localism—which should be the credo of the urban design in this country of such a rich diversity of cultures—will prevail and enhance the cultural identity of the Balinese towns.

REFERENCES

- Appleyard, Donald, *Planning a Pluralist City: Conflicting Realities in Ciudad Guyana* (New York: Oxford University Press). 1973.
- Bechtel, Robert B., *Environment and Behaviour: An Introduction* (Thousand Oaks: Sage Publishers). 1997.
- Lynch, Kevin, *The Image of the City* (Cambridge: The MIT Press). 1960.
- Moore, Gary T., Knowing About Environmental Knowing: The Current State of Theory and Research on Environmental Cognition in J.S. Pipkin, M. La Gory and J.R. Blau (eds.): *Remaking the City: Social Science Perspectives on Urban Design* (Albany: State University of New York Press). 1983.
- Nordholt, Henk Schulte, Temple and Authority in South Bali, 1900-1980 in H. Geertz (ed.): *State and Society in Bali*, (Leiden: KILTV Press). 1991.
- Rapoport, Amos, *Human Aspects of Urban Form* (Oxford: Pergamon Press). 1977.
- Rapoport, Amos, Urban Design and Human Systems: On Ways of Relating Buildings to Urban Fabric in P. Leconte, J. Gibson & A. Rapoport (eds.): *Human and Energy*
- Factors in Urban Planning: A System Approach* (The Hague: Martinus Nijhoff Publishers). 1982.
- Rapoport, Amos. Identity and Environment: A Cross-cultural Perspective in J.S. Duncan (ed.): *Housing and Identity: A Cross-cultural Perspective* (London: Croom Helm). 1981.
- Rapoport, Amos, On the Cultural Origins of Settlements in A.J. Catanese and J.C. Snyder (eds.): *Introduction to Urban Planning*, New York: McGraw-Hill. 1979.
- Samadhi, T. Nirarta, *The urban design of a Balinese town: placemaking issues in the Balinese urban setting*, Habitat International, 25/4, 2001: 559-575.
- Samadhi, T. Nirarta, *Urban Design Concepts for Achieving a Balinese Town Conducive to Cultural Identity*, paper presented at The 29th International Making Cities Livable, Savannah, GA, USA, 4-8 March 2001.
- Wheatley, Paul, *The Pivot of Four Quarters: A Preliminary Enquiry into the Origin of the Ancient Chinese City* (Chicago: Aldine Publishing Company), 1971.

⁶ This is one of the fundamental questions posed by EBS (Environmental Behavior Studies), espoused by Rapoport (1977, 1982).