

The Resilience of Undagi's Role in Traditional Balinese Architecture Based on Asta Kosala Kosali in Bali, Indonesia

By

Ngakan Ketut Acwin Dwijendra

Faculty of Engineering, Udayana University, Bali, Indonesia

Email: acwin@unud.ac.id

I Made Adhika

Faculty of Engineering, Udayana University, Bali, Indonesia

Abstract

Undagi is a term for traditional Balinese architects. An undagi equips himself with engineering knowledge and has to learn and understand art, culture, customs, and religion. This must be mastered by an undagi so that designing and creating building works is in harmony and line with the concept of Asta Kosala Kosali Bali. The role of an undagi in designing traditional buildings and sacred buildings is critical because it involves nature, humans, and God. This causes an undagi to be holy because it has to be in direct contact with God. The role of Undagi in Traditional Architecture is significant and big because an undagi has noble values that can influence the development and order of life of traditional Balinese people from time to time. The phenomenon that occurs in the present era is the degradation of Undagi's role which is faced with the challenges of modernization in terms of concepts, technology, materials and modern style forms. This study will investigate the extent to which Undagi's role in developing traditional Balinese architecture based on Asta Kosala Kosali is and how the Undagi's role is in the development of traditional Balinese architecture in the contemporary era with the influence of modernization and globalization. The research was conducted using a qualitative method, namely through in-depth interviews with the snow ball method to the Undagi, traditional leaders and the community as well as direct observation of the work of the Undagi on traditional Balinese architecture to obtain information on the role of Undagi and the resilience of Undagi in the present. This study indicates a decline in the transfer of skills and knowledge of the Undagi to the next generation. Therefore, this study's results are expected to contribute to science, namely how the resilience of Undagi's role as Balinese local wisdom in preserving the sustainability of Balinese Traditional Architecture development.

Keywords: resilience, undagi, architecture, traditional, Balinese.

Introduction

The embodiment of a traditional Balinese architecture building is a form of an artificial environment that is closely related to the attitudes and outlook on life of the Balinese people and cannot be separated from the joints of religion, customs, beliefs, and religious systems that underlie aspects of life, which are conditional on the concept of ancestors, namely Asta Kosala Kosali (N.K.A. Dwijendra, 2020b, 2020a; Muliawan, 2017).

The role and influence of Hinduism in its realization is the implication of religion with various social lives, where Hinduism teaches humans to harmonize the universe with all its contents, namely the bhuana agung (macro cosmos) with bhuana alit (microcosmos),

where the *bhuana agung* is an artificial environment and *bhuana alit* is the human who built and used the container .

Humans (*bhuana alit*) are part of nature (*bhuana agung*), in addition to having the same constituent elements, there are also differences in size and function. Humans as content and nature as a container, are always in a state of harmony and harmony like a bead (fetus) in a *cucupu* (mother's womb). The uterus as a place that provides life, protection and development of the fetus, as well as humans exist, live, develop and take refuge in the universe, this is then known as the concept of bead ring *cucupu* (Ngakan Ketut Acwin Dwijendra, 2003; Primadewi et al., 2021; Wicaksana, 2018).

Undagi is a term for traditional Balinese architects. An *Undagi* not only equips himself with engineering knowledge, but also has to learn and understand art, culture, customs and religion (Alit, 2003; Macrae & Parker, 2013; Suryawan & Juniantari, 2021). This must be mastered by an *Undagi* so that in the process of designing and creating building works it is in harmony and in line with the *Tri Hita Karana* concept. It should also be mentioned that the *Undagi* as the makers must pay attention to the provisions of the wood sacralization process in terms of the "holiness of the wood" of the building or their work. So that before pursuing the *Undagi* profession, one must go through a cleaning process on a scale and *niskala* (N.K.A. Dwijendra, 2020c; Nurjani & Dwijendra, 2020; Nuryanto et al., 2021).

Undagi are traditional Balinese architects who are patronized by Bhagawan Wiswakarma as the architect of the art of building the Gods who in one of the *lontars* about Balinese architecture mentioned, through their artwork, a place can have a representation of civilization of life, art and culture in creativity and taste with values. local culture to be beautiful and comfortable. *Undagi* is an advantage and uniqueness of local culture as an effort to maintain cultural locality and this uniqueness is one of the cultural resources to increase conservation development which in turn can increase the economic resources of the community .

The existence of the *undagi* in Bali has had a fairly long history in the origins of the history of the island of Bali. However, in its development, there has been a degradation of *Undagi's* role in the development of Balinese Traditional Architecture, so this research will investigate the extent to which the *Undagi's* role in the development of traditional Balinese architecture in the present day is based on *Lontar Asta Kosala Kosali*.

From the background above, it can be stated that the formulation of the problem in this study is to investigate the phenomenon of the degradation of *Undagi's* role in the construction of buildings and containers for Traditional Balinese Architecture based on *Asta Kosala Kosali*. The challenge for *Undagi's* role is the emergence of new architects and modernization of concepts, technology, materials and trends or styles (Dwijendra, N.K. & Mahardika, 2018; N.K.A. Dwijendra et al., 2020; Kurniawan et al., 2020).

So that the research problem formulation is: (1) What is the role of *Undagi* in the development of traditional Balinese architecture based on *Asta Kosala Kosali*? (2) How is the resilience of *Undagi's* role in the design of traditional Balinese architecture in the present era? This research is expected to contribute to science, namely how the resilience of *Undagi's* role as Balinese local wisdom in the Development of Modern Balinese Traditional Architecture

This research is a step to interpret interpretively about several things, namely: (1) Understanding the essence of Undagi's role as Balinese local wisdom in the development of traditional Balinese architecture based on Asta Kosala Kosali (2) Understanding how the sustainability of Undagi's role in the design of traditional architecture is Bali at the present time as the self-concept of the people in Bali, due to changes in thought processes with the development of science, technology and their interactions in the social environment. The final objective of this research is to investigate the role of Undagi in the development of traditional Balinese architecture based on Asta Kosala Kosali and the resilience of Undagi's role in the design of traditional Balinese architecture in the present (I. Adhika et al., 2020; N.K.A. Dwijendra, 2020b; Gde et al., 2018; Suryawan & Juniantari, 2021).

This research is expected to contribute to science, namely how the resilience of Undagi's role as the conservation of Balinese local wisdom in the Development of Traditional Balinese Architecture in the Contemporary Period. This research is also expected to provide great benefits and contributions for both the government and the community, such as: (1) Can make a useful contribution to the community and policy implementers in the involvement of Undagi in development, (2) Can contribute theory regarding the resilience of Undagi's role as wisdom local Balinese in the sustainability of the preservation of Traditional Balinese Architecture buildings.

Research Method

The research was conducted using a qualitative method (Almeida et al., 2017; Djamba & Neuman, 2002; Sugiyono, 2009, 2016), namely through in-depth interviews with the snow ball method to the Undagi, traditional leaders and the community as well as direct observation of the work of the Undagi on traditional Balinese architecture to obtain information on the role of Undagi and the resilience of Undagi in the present day. This research is expected to contribute to science, namely how the resilience of Undagi's role as Balinese local wisdom in preserving the sustainability of Balinese Traditional Architecture development.

The research method is a scientific process or method to obtain data to be used for research purposes. Understanding the problem of this research, regarding the Resilience of Undagi's Role in Modern Balinese Traditional Architecture, qualitative research with a focused ethnographic approach is used to obtain interpretative conclusions.

The data collecting method is triangulation (mixed), and data analysis is inductive or qualitative, with qualitative research outcomes emphasizing meaning rather than generalization. The purpose of data collection was to get the information needed to meet the research objectives. Several methods will be used to collect data in this study, including observation, interviews, documentation, and data triangulation (Neuman, 2011; Sugiyono, 2009, 2015).

Analyzing data is a continuous process in a study when the researcher is finished in the stage of collecting data. The data analyst aims to reduce the data to a simpler form that can be understood and interpreted in a certain way, so that the relationship of the research problem can be studied and tested. The qualitative data analysis method is an in-depth processing approach of observational data, interviews, and literature data. If the empirical data employed is qualitative data in the form of words that cannot be categorized, this qualitative data analysis is performed. This qualitative analysis activity, according to (Lougen, 2009; Marvasti, 2018; Strijker et al., 2020) comprises of three streams of activities

that occur simultaneously: data reduction, data presentation, and conclusion drafting or clarification. There is a process of selecting, reducing, abstracting, and altering rough data that comes from field notes at this data reduction stage. This data reduction is a type of analysis used to sharpen, classify, direct, delete superfluous, and arrange data so that appropriate and verifiable conclusions can be reached later (Crowe & Sheppard, 2012; Earley, 2014; Goldkuhl, 2019).

The sort of analysis used in this study was domain analysis, which is used to get a broad and complete view of the research topic or social situation. Researchers discover various categories or specific topics as a basis for further research by asking general and detailed questions. Through the ethnographic study used in this study, the steps of data analysis were carried out in several stages, namely: organizing the data, reading the entire information and coding, describing the social setting and research research, interpreting findings, presenting narrative presentations in the form of tables, pictures or description and the last step is a case study.

The data in this study in the form of interviews with the Undagi, is a benchmark for revealing the meaning and role of the Balinese Undagi in the development of Balinese Traditional Architecture. The data were analyzed with several other theoretical approaches, so that the essence and existence of the change in the concept of the symbol in the pelinggih can be understood more deeply. This technical analysis was chosen to understand the problems of socio-cultural changes in Balinese society at the present time.

Data processing is carried out to prepare the data that has been collected so that it becomes data that is ready for analysis and makes it easier to analyze the data so as to produce the right analysis results. The steps or activities carried out in data processing are: editing the data that has been collected, evaluating the data obtained, if it is felt that there are irregularities or data input errors, corrections are made according to the level of error, grouping the data according to the criteria and variables to be determined. researched and displays data in the form of tables, graphs or other means such as sketches and drawings. The nature of the research is descriptive exploratory, so the analysis used is non-statistical analysis, namely analysis by reading the results of research at each location. Based on these data, then described by displaying in the form of tables or graphs and pictures and described in a description the conditions of change and their impact on values and meanings. After the analysis has been carried out, the final stage is drawing conclusions and suggestions that can be used to provide recommendations for both policy makers, the community, actors in the world of architecture and buildings.

Results And Discussion

Undagi in Traditional Balinese Architecture Based on Asta Kosala Kosali

In the Asta Kosala Kosali papyrus the meaning is only stated: "This is the teaching regarding knowledge of Asta Kosala Kosali, it should be known by those who work in the field of skills (especially building)" From this simple expression and listening to the contents of the lontar, it can be understood: design and construction, traditional Balinese buildings, be it parhyangan, pawongan and palemahan buildings (supporting buildings), including death buildings. This guide is intended primarily for undagi 'traditional architects/building artists' including builders, as a foundation in carrying out the profession. Also very useful for clergy (pinandita and pandita) associated with ritual processions.

Asta Kosala Kosali contains various sizes of building elements such as the size of the pillars, symbols, sunduks, and others including the size of the land, the distance between buildings, the placement of doors to the outside, the choice of wood materials, padewasan, offerings, mantras and so on (Ngakan Ketut Acwin Dwijendra, 2003; Ngakan Ketut Acwin Dwijendra, Idedhyana, et al., 2020; Yusuf, 2016).

The provisions of Building Architecture in Bali that are used as guidelines by the undagi and pinandita are related to the place/plan based on Lontar Asta Bhumi, related to the building/construction based on Lontar Asta Dewa and Lontar Asta Kosala Kosali and related materials/herb based on Lontar Asta Dewa and Lontar Asta Kosala Kosali, Janathaka such as: wood, fibers, reeds, natural stone, brick and so on (Ngakan Ketut Acwin Dwijendra, 2020; Ngakan Ketut Acwin Dwijendra, Wiriantari, et al., 2020; Putra et al., 2019).

Asta Kosala Kosali is the foundation for traditional building, thus its history can be traced briefly based on the Bebetin Inscription dated 818 Saka (896 AD), where at that time, in Bali there was already a known expert on traditional Balinese architecture called Undagi.

The ancient Balinese era with Kebo Iwa figures, based on lontars related to his existence, he mentions the role of Kebo Iwa in building several parhyangan and also defense buildings that refer to Asta Kosala Kosali. This era has also developed a pattern of settled settlements with a village pattern of the Be predecessor kingdom, the pepatih houses and also the people. Likewise, many sacred places have been built (family sanggah/merajan, village-owned temples, subak temples and so on) (Suyoga, 2020; Wicaksana, 2018).

The next era of Ancient Bali around the 11th century came Mpu Kuturan, uniting sects with the offer of the Tri Murti Concept. This concept is materialized in the form of a kemulan pelinggih building to be placed in every family sanggah/merajan, as well as being equipped with the Kahyangan Tiga Temple (Desa, Puseh, Dalem), the development of the Meru pelinggih. The construction of the pelinggih and the temple is of course based on a reference to the design guide (Sukat/Sikut). In this case, Asta Kosala Kosali is increasingly equipped with content.

The Bali Madya era during the Majapahit era ruled Bali, the more complex the construction of residential houses and shrines became. The presence of the figure of Dang Hyang Nirartha with the development of the concept of the Padma pelinggih also complements the layout of the shrine building. It can be predicted with certainty that the guide in Asta Kosala Kosali is also increasingly equipped, refined, including being linked to the traditional Social Stratifications that developed during that era. Asta Kosala Kosali's guide, which was perfected in the Dalem Klungkung era as king of the king of Bali, was then distributed to all subordinate kingdoms (*Asta Negara*), as a reference in the realm of building and development (Acwin Dwijendra & Gede Agung Diasana Putra, 2020; Ngakan Ketut Acwin Dwijendra, 2003; Ferschin & di Angelo, 2012).

The perundagian period is the end of prehistory in Indonesia according to R.P Soejono, the word *perundagian* comes from the Balinese language; undagi, which means a person or group of people or a group of people who have the intelligence or skills of a certain type of business, for example, making pottery, wooden jewelry of the type of canoe business, and stone (Alit, 2003; Suryawan & Juniantari, 2021).

Undagi are traditional Balinese architects who are patronized by Bhagawan Wiswakarma as the architect of the art of building the Gods who in one of the lontars about

Balinese architecture mentioned, through their artwork, a place can have a representation of civilization of life, art and culture in creativity and taste with values. local culture to be beautiful and comfortable (Alit, 2003; Macrae & Parker, 2013; Suyoga, 2020).

Furthermore, it was stated that it should also be mentioned that the undagi as the makers must pay attention to the provisions of the wood sacralization process in terms of the "holiness of the wood" of the building/work. The existence of the undagi in Bali has had a long history in which the origins of the history of the island of Bali are told. Long ago, during the perundagian era in megalithic culture, which produced buildings of large stones. These stones are usually not finely worked, only roughly flattened to get the required shape. As in the traces of the megalithic in Bali, the megalithic tradition is said to still be alive and well in today's society, and an important finding is a standing stone (menhir) found at Ratu Gede Pancering Jagat Temple in Trunyan. In this temple there is a statue called the Da Tonta statue which has characteristics originating from the megalithic tradition, this statue is almost 4 meters high.

Another finding is in Sembiran (Buleleng), which is known as an ancient Balinese village, in addition to the villages of Trunyan and Tenganan. The megalithic tradition in Sembiran village can be seen in the temple which is revered by the locals to this day. Of the 20 temples, it turns out that 17 temples show megalithic forms and are generally made very simple. Among them there are terraces in the form of terraces, standing stones in the most gigantic and some are only an arrangement of river stones.

Another important finding is also the megalithic buildings found in Gelgel (Klungkung Regency). An important finding in the village of Gelgel is a menhir statue, which is found in Panataran Jro Agung Temple. This menhir statue is made of stone that contains important religious values, namely as a symbol of fertility that can give life to the community. The role of Undagi is also mentioned in Lontar Dharma Laksana related to undagi bade as other accessories in the Ngaben ceremony (Ngakan Ketut Acwin Dwijendra, 2003; Kurniawan et al., 2020).

The existence of the Undagi in Bali, has a fairly long history which in the origin of the history of the island of Bali is told that in the past, the perundagian era in the Megalithic culture produced buildings of large stones. These stones are usually not finely worked, only roughly flattened to get the required shape. As in the traces of the Megalithicum in Bali, the Megalithic tradition is said to still be alive and well in today's society, and an important finding is the Standing Stone (*menhir*) found at Ratu Gede Pancering Jagat Temple in Trunyan. In this temple there is a statue as high as four meters called the Da Tonta statue whose characteristics come from the Megalithic tradition.

Another finding, in Sembiran, Buleleng, which is famous as an ancient Balinese village, in addition to the villages in Trunyan and Tenganan. Megalithic traditions in Sembiran Village can be seen in the temples that are worshiped by local residents to this day. Of the 20 temples, it turns out that 17 temples show Megalithic forms and are generally made very simple.

Among them there are terraces in the form of terraces, standing stones in the most gigantic and some are only an arrangement of river stones. Another important finding, also in the form of megalithic buildings found in Gelgel, Klungkung, in the form of a statue of Menhir at Pura Panataran Jro Agung. This Menhir statue is made of stone that contains important religious values, as a symbol of fertility. This discovery is proof that Undagi is

indeed closely related to ancient traditions, which eventually continue to develop more specifically with time (Alit, 2003; A. Dwijendra, 2013; Ngakan Ketut Aciwini Dwijendra, 2018; Suyoga, 2020).

The perundagian period is the end of prehistory in Indonesia according to R.P Soejono, the word perundagian comes from Balinese; undagi, which means a person or group of people or a group of people who have the intelligence or skills of a certain type of business, for example, making pottery, wooden jewelry of the type of canoe business, and stone.

The Role of Undagi as a Transformation of Cultural Traditions

Tradition was traditionally regarded as static in the 1950s and 1960s in terms of shifting cultural traditions, with few advances based on the conventional rules of society's elites. Tradition, on the other hand, is no longer always a static phenomena, but rather a continuous process of change (Eisenstadt 1973). The character of family life, social institutions, and religious beliefs and practices are influenced by the contact of community members with other cultures and the growth of social and cultural movements (Gusfield 1967).

The concept of a tradition is quite adaptable, and it can be modified via decades of transmission. This method of transmission refers to concepts derived through human responses to old traditions that have remained mostly unchanged (Shils 1971, 1981). According to Shils, tradition transmission focuses on intergenerational interaction, which is a "chain" and a "bridge" of communication for transferring traditions within a specific social structure (Shils 1971, pp. 125, 134). As a result, transformation can be described as a transition in which an item or circumstance shifts from one state to another (Poerwadarminta 1989: 981). According to Soekanto, there are a variety of factors that influence change (1984:10). Change is defined as a pattern of transmission or a stable status from one pattern of behavior to another. There are several factors that influence change, including (1) technology, which is influenced by all aspects of life that involve technology; (2) lifestyle, which is influenced by time and changes in job classification, age, and status level; (3) politics, which is influenced by the policies of the power holders; and (4) economics, which examines the conditions and developments in the community.

Undagi is a traditional craftsman with traditional and spiritual carpentry skills in Balinese society. This tradition is not anything set, but it may be characterized as the inheritance of habits, beliefs, and ideas that involve communal engagement in a society. communities influenced by other cultures This relationship includes not only inheritance, but also acceptance and recommendation based on the recipient's numerous incentives. The recipient may embrace a tradition without first analyzing it, or they may do it subconsciously and without thinking about it (Dharmayanty et al., 2020; Ngakan Ketut Aciwini Dwijendra & Suyoga, 2020; Ferschin & di Angelo, 2012). These activities are done and considered as proper and decent simply because they have been done before by past generations.

Some traditions, on the other hand, are adopted after a review of whether the new customs met certain criteria in a community through a process of adaptation. Old traditions may be adapted to fit new circumstances, or old traditions may be used for new purposes, during this process (Hobsbawm 1983). The act of analyzing and embracing a new custom reveals that it evolves through time. This change is a link between the "imagined past" and the "created present," where change becomes a continuous process of transformation (Wood 1993, p. 58) or a process of updating and modification (Hoben & Hefner 1991).

A tradition is a process of selectively embracing new items rather than merely replicating past traditions. To fit existing needs, a new tradition will go through a screening, adjustment, and modification process (Geriya 2007; Mantra 1993; Nordholt 1986; Vickers 1989; Agung 1991; Dharmayuda 1995; Picard 1996). The interaction of residents with people from other cultures has an impact on the acceptance of new traditions in a society (Gusfield 1967).

Using the above theory of tradition transmission, the cultural change in Undagi's role in Balinese society and the traditions in it are investigated in order to better understand the ways in which people survive in culture as a response to new circumstances and demonstrate their identity, which can take the form of transformation, acculturation, or inculturation.

Resilience of Undagi's Role in Traditional Balinese Architecture

The concept of resilience comes from the Latin 'resilio' which means 'to return to the beginning' and in a social context, resilience refers to the ability to survive in a chaotic situation (Naranjo-Valencia & Calderón-Hernández, 2015; Schalk, 2014; Ungar et al., 2007). The concept of resilience was originally an adaptation of the disciplines of Psychology and Psychiatry in the 1940s which underlined that humans have the ability to be able to respond and be able to survive in situations that are unwanted or out of control. So far, the concept of resilience has been applied in several disciplines, especially the study of disaster. This is because the concept of resilience can be used to understand disaster management and how the government is trying to minimize the risk of disasters. In disaster studies, resilience does not only mean providing assistance to victims, but also their capacity and ability to deal with disasters. Through the concept of (Folke, 2016; Folke et al., 2010; Hamborg et al., 2020), vulnerability and risk from disasters can be transformed into a framework that can strategically map the ability of the affected community in carrying out their social life. Furthermore, Greiving and Ubaura explain that resilience is a way to survive against uncertainty due to future conditions that are difficult to predict and the possibility of vulnerabilities that exist in society.

Resilience is the ability of a system or community affected by the threat of disaster to be able to survive, accommodate, and recover in a short and efficient time, including the ability to maintain a normal situation (Shamsuddin, 2020; Skevington et al., 2020; Ungar et al., 2005). Resilience is also a way of thinking in understanding the problems that arise and how to find solutions to overcome disaster problems.

The capacity of society according to Chaskin moves through some combination of three levels of social interaction including individuals, organizations and networks of associations. The individual level in question is the skills, knowledge, and resources of individual residents in the community. Then, the organizational level focuses on other association organizations including community-based organizations (Cilk, 2020; Mandal, 2017; Sifatu et al., 2020; Wirawibawa et al., 2021). Finally, the ability of these collectivities to carry out their functions responsively, effectively, and efficiently as part of a wider system of actors and processes with which they are connected, both within and outside the community, reflects the network of associations. The community's capability consists of the following characteristics: first, a sense of community (one unit) based on individuals' level of closeness and recognition of mutuality of situations. The existence of commonly held values, standards, and visions, such as a sense of trust, ownership, and sharedness, as well as cognitive qualities, is one component of a sense of community (including the ways in which community members attribute meaning to their membership in a group). Second, the amount of commitment among community members as members of specific persons, groups, or

organizations that are responsible for what occurs in the community and invest time, energy, and other resources to improve it (Carter & Hawkins, 2019; Pacheco-Mangas et al., 2020; Schalk, 2014; Theron et al., 2015).

The existence of the undagi in Bali has had a fairly long history in the origins of the history of the island of Bali. However, in its development, there has been a degradation of the role of Undagi in the development of Balinese Traditional Architecture, so it is important that the resilience of the role of the Undagi in the development of traditional Balinese architecture in the present day is based on Lontar Asta Kosala Kosali (Macrae & Parker, 2013; Oka et al., 2021; Suryawan & Juniantari, 2021).

Undagi are traditional Balinese architects who are patronized by Bhagawan Wiswakarma as the architect of the art of building the Gods who in one of the lontars about Balinese architecture mentioned, through their artwork, a place can have a representation of civilization of life, art and culture in creativity and taste with values. local culture to be beautiful and comfortable. Asta Kosala Kosali also determined that there are several woods that must be placed according to the designations and statuses described in religious literature (I. M. Adhika & Dwijendra, 2020; Wiryasa & Dwijendra, 2021; Yogantari & Dwijendra, 2020). The use of Asta Kosala Kosali in the construction of Balinese buildings or holy places, for example, will make everything that is done has taksu or spiritual power. Undagi's profession looks increasingly unique, especially when it finally handles more specific things, such as making various equipment for Ngaben infrastructure.

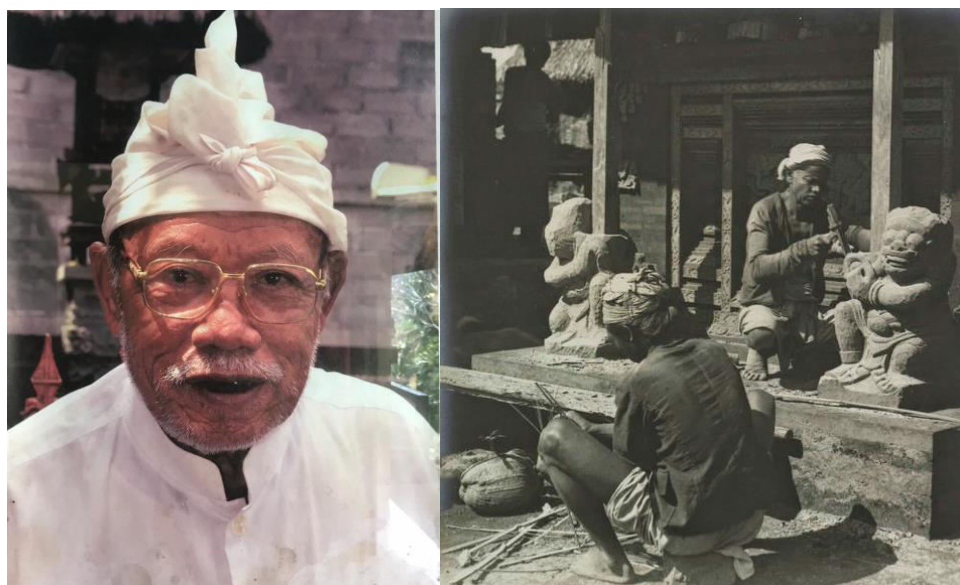


Figure 3.1. *Undagi Bali and Building Works*

One of the Undagi that already has a big name is Undagi Gases. The Undagi group, which is located in Sesetan, Denpasar, has made Undagi make containers, bade, oxen, and other facilities for the Ngaben ceremony as a profession. In Bali, the profession as an Undagi is said to be unique because it is also related to customs, culture, and religion. Undagi and one of the owners of Gases Bali, Indra Wirawan, does not deny that there is a long process that must be passed before becoming an Undagi (Figure 3.1). “Being an undagi cannot be careless or aji while being ignored. There is a series of special training and rituals before it is legal called Undagi. Those who happen to have the expertise to make containers and bade, but are not given special training and mawinten rituals, cannot be said to be Undagi.

Wirawan said, there are many special rules that an Undagi must know. In Dharma Laksana's ejection, he continued, several basic rules were described that an Undagi must follow. "If he is just an artist, not an Undagi, usually they make a container based on his art. Or just looking good and unique. However, if he is an Undagi he must know what the function, philosophy and meaning of each part of the bade or container are. And, there is a special rule of manufacture that only an Undagi knows.

Based on the results of an in-depth interview with Komang Gases, he explained the importance of the mawinten procession for an Undagi, so that the resulting work does not only function as decoration. Undagi Pawintenan may rarely be heard. However, it is a mandatory procession for us Undagi. The goal is to purify oneself physically and mentally. Of course, it is related to purification in carrying out its duties as Undagi. He said that this mawinten was not only done by Undagi. Everything related to the execution of the work is also diwintened, such as banten artisans, blacksmiths, sculptors, even balians are also mawinten. It's just, in terms of offerings that are somewhat different according to their profession. For example, if someone who can work on a holy place, but has not carried out a cleansing ceremony in the form of pawintenan, usually he encounters many problems and obstacles. This process is also part of the things that an Undagi must understand.

When asked how much turnover did he receive when carrying out his profession as Undagi? "He explained that if it was a good day for the Ngaben ceremony, the orders received could reach 150 bade or oxen per month. "When asked about the income figure, I am not willing to answer. But what is clear is with a turnover of 150 pieces per month with a price range of ten to 15 million rupiah per piece. I think that's enough to pay our 200 employees."

Regarding the basic ingredients for making bade, he admits that now it is more in line with the times. No longer have to use bamboo, or bamboo caterpillars, but now it is more modern, which can use styrofoam and gypsum as decoration. "Indeed, there are some materials that cannot be replaced, such as bamboo for the placemat for the bodies, both in number and in the location of the bamboo, because there is a separate calculation. However, for other basic materials, substitute materials that are more durable and easier to apply can be used.

When asked why he was interested in becoming an Undagi, "If you ask me that, I don't even know how to answer. Maybe it's because my brother and I often see your father making it (bade, containers and oxen), that's why we are also interested. But, actually this is just a hobby that we live. Apart from being an Undagi, we have other fields and professions that we are involved in," he admitted that there were many difficulties experienced when he became an Undagi, especially when starting the production process. "There were many difficulties, especially when orders began to pile up. We couldn't just make it, we must pay attention to the standards, good days and the materials used, it's not arbitrary," he explained.

Once there was a request to make a container and oxen for a large cremation (*ngaben*), which had to be completed in a day. Because its mission is to facilitate as well as launch the Ngaben ceremony procession, he continued, this request must be fulfilled. "We were confused, finally my other friends focused their energy on handling the sudden request first. After a day of work, the total rioting was finally over," he said.



Figure 3.2. *The Balinese Undagi are Carrying out the Construction of a Temple in Bali*

That is how an Undagi plays a role in the development of Balinese Traditional Architecture. It is not easy to become an Undagi and it is also not easy to survive in the development of technology and modern artisan workers who are increasingly depressing Undagi Bali's position. So it is very natural, nowadays it is very difficult to find craftsmen who understand Balinese Architecture (Figure 3.2). The government and the community need to formulate a strategy to revive the Undagi Bali, with socialization, incentives, training and inclusion in development regulations.

Conclusion

Undagi is a term for traditional Balinese architects. An undagi not only equips himself with engineering knowledge, but also has to learn and understand art, culture, customs and religion. It must be mastered by an undagi so that in the process of designing and creating building works it is in harmony and in line with the Asta Kosala Kosali concept. The role of an undagi in designing traditional buildings and sacred buildings is very important because it involves nature, humans, and God. This causes an undagi to be holy because it has to be in direct contact with God. The role of Undagi in Traditional Architecture is very important and big because an undagi has noble values that are able to influence the development and order of life of traditional Balinese people from time to time.

The research shows that in the present era there has been a degradation of Undagi's role which is faced with the challenges of modernization in terms of concepts, technology, materials and modern style forms. Research recommends the need for resilience (resilience) the role of the Undagi in the development of traditional Balinese architecture in the present and most of the development is carried out by senior Undagi so that there is a need for regeneration of their successors. Given that only Undagi is capable of contributing to the development of traditional Balinese architecture based on Asta Kosala Kosali, particularly for temple buildings, a long-term strategy is required to ensure Undagi's involvement in traditional Balinese architecture design in the present and future.

References

- Acwin Dwijendra, N. K., & Gede Agung Diasana Putra, I. D. (2020). Collaboration and Acculturation to Manage and Create Architectural Design of Giri Natha Temple, Timor Leste: The Architectural Harmony between Bali and Timor Leste. *Talent Development & Excellence*, 12.
- Adhika, I., Dwijendra, S. T., & IPU, A. (2020). Local Wisdom in Reducing Greenhouse Effect on Balinese Traditional Settlement Patterns in Bongli Village, Bali, Indonesia. *Engineering and Technology ...*
- Adhika, I. M., & Dwijendra, N. K. A. (2020). Selfie photos area and its implication to water availability and social culture in Wanagiri Village, Bali Indonesia.

- International Journal of Psychosocial Rehabilitation, 24(4).
<https://doi.org/10.37200/IJPR/V24I4/PR201652>
- Alit, I. K. (2003). Kinerja Undagi dalam Pembangunan Perumahan. *Jurnal Permukiman*, 1(2).
- Almeida, F., Superior, I., Gaya, P., Queirós, A., & Faria, D. (2017). Strengths and Limitations of Qualitative and Quantitative Research Methods. *European Journal of Education Studies*, 3(9).
- Carter, K., & Hawkins, A. (2019). Joy at work: Creating a culture of resilience. *Nursing Management*, 50(12). <https://doi.org/10.1097/01.NUMA.0000605156.88187.77>
- Cilk, M. (2020). National Culture and Urban Resilience. *Consilience*, 22.
- Crowe, M., & Sheppard, L. (2012). Mind mapping research methods. *Quality and Quantity*, 46(5). <https://doi.org/10.1007/s11135-011-9463-8>
- Dharmayanty, N. L. P. D., Paturusi, S. A., Dwijendra, N. K. A., & Dewi, N. K. A. (2020). The meaning of vertical housing for balinese people, the debate between cultural demands and the need for urban housing in Bali, Indonesia. *International Journal of Psychosocial Rehabilitation*, 24(8).
<https://doi.org/10.37200/IJPR/V24I8/PR280300>
- Djamba, Y. K., & Neuman, W. L. (2002). Social Research Methods: Qualitative and Quantitative Approaches. *Teaching Sociology*, 30(3).
<https://doi.org/10.2307/3211488>
- Dwijendra, A. (2013). Quality of affordable housing projects by public and private developers in Indonesia: The case of Sarbagita Metropolitan Bali. *Journal of Geography and Regional Planning*. <https://doi.org/10.5897/JGRP12.050>
- Dwijendra, Ngakan Ketut Acwin. (2018). Eco Tourism Opsi Pengembangan Pariwisata Berkelanjutan di Wilayah Bali Tengah. *Senada*, 1(1).
- Dwijendra, Ngakan Ketut Acwin. (2003). Perumahan Dan Permukiman Tradisional Bali. *Jurnal Permukiman "Natah."*
- Dwijendra, Ngakan Ketut Acwin. (2020). How the Local Wisdom Influences the Sustainability of Spatial Development in Denpasar, Bali, Indonesia. *BHUMI: Jurnal Agraria Dan Pertanahan*, 5(3). <https://doi.org/10.31292/jb.v5i3.389>
- Dwijendra, Ngakan Ketut Acwin, Idedhyana, I. B., Putu Sueca, N., & Wirawibawa, I. B. (2020). Ornamental Variety of Garuda and Wilmana on Padmasana Architecture at Kahyangan Jagat Temple in Bali, Indonesia. *International Journal of Engineering and Emerging Technology*, 5(1).
<https://doi.org/10.24843/ijeet.2020.v05.i01.p08>
- Dwijendra, Ngakan Ketut Acwin, & Suyoga, I. P. G. (2020). Analysis of symbolic violence practices in balinese vernacular architecture: A case study in Bali, Indonesia. *International Journal of Innovation, Creativity and Change*, 13(5).
- Dwijendra, Ngakan Ketut Acwin, Wiriantari, F., Widiyani, D. M. S., & Yulianasari, A. A. A. S. R. (2020). Transformation of catuspatha in Bali Indonesia: Alteration ideas from empty space to aesthetic element of city. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 12(6).
<https://doi.org/10.21659/RUPKATHA.V12N6.09B>
- Dwijendra, N.K. & Mahardika, M. D. (2018). The Influence Of Globalization On The Existence Of Local Culture In Indonesia. *Asian Academic Research Journal of Social Sciences & Humanities*, 5(6).
- Dwijendra, N.K.A. (2020a). From tradition to modernization in morphological process of indigenous settlement patterns in Bali, Indonesia. *International Journal of Advanced Science and Technology*, 29(8 Special Issue).

- Dwijendra, N.K.A. (2020b). Identity struggle perspective in car-shaped shrine in paluang temple, nusa penida bali, Indonesia. *International Journal of Psychosocial Rehabilitation*, 24(4). <https://doi.org/10.37200/IJPR/V24I4/PR201653>
- Dwijendra, N.K.A. (2020c). Meru as a hindu sacred building architecture with a high roof and resistant to earthquakes in Bali, Indonesia. *Civil Engineering and Architecture*, 8(3). <https://doi.org/10.13189/cea.2020.080319>
- Dwijendra, N.K.A., Adhika, I. M., Putra, I. D. G. A. D., Mananda, I. G. P. B. S., & Adnyana, I. B. P. (2020). Design model innovations for tourism villages in Bangli, Bali Indonesia: Debate between environmental and cultural protection versus community economic development. *International Journal of Advanced Science and Technology*, 29(7).
- Earley, M. A. (2014). A synthesis of the literature on research methods education. *Teaching in Higher Education*, 19(3). <https://doi.org/10.1080/13562517.2013.860105>
- Ferschin, P., & di Angelo, M. (2012). Procedural Modelling of Traditional Balinese Settlements. CHNT'16.
- Folke, C. (2016). Resilience (Republished). *Ecology and Society*, 21(4). <https://doi.org/10.5751/ES-09088-210444>
- Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience thinking: Integrating resilience, adaptability and transformability. *Ecology and Society*, 15(4). <https://doi.org/10.5751/ES-03610-150420>
- Gde, A. A., Bharuna, D., Salain, P. R., Suartika, G. A. M., & Dwijendra, N. K. A. (2018). Change of Function and Space of Puri in Bali: A Social History. *International Journal of Engineering and Emerging Technology*, 3(1).
- Goldkuhl, G. (2019). The generation of qualitative data in information systems research: The diversity of empirical research methods. *Communications of the Association for Information Systems*, 44(1). <https://doi.org/10.17705/1CAIS.04428>
- Hamborg, S., Meya, J. N., Eisenack, K., & Raabe, T. (2020). Rethinking resilience: A cross-epistemic resilience framework for interdisciplinary energy research. *Energy Research and Social Science*, 59. <https://doi.org/10.1016/j.erss.2019.101285>
- Kurniawan, A., Salain, P. R., Dwijendra, N. K. A., & Rajendra, I. G. N. A. (2020). Revealing the meaning behind Mandala of Agung Karangasem Palace, Bali Indonesia: Investigating through semiotics for preservation of historic value. *International Journal of Advanced Science and Technology*, 29(7).
- Lougen, C. (2009). Sources: The Sage Encyclopedia of Qualitative Research Methods. *Reference & User Services Quarterly*, 49(1). <https://doi.org/10.5860/rusq.49n1.101>
- Macrae, G., & Parker, S. (2013). Would the real Undagi please stand up? On the social location of Balinese architectural knowledge. *Bijdragen Tot de Taal-, Land- En Volkenkunde / Journal of the Humanities and Social Sciences of Southeast Asia*, 158(2). <https://doi.org/10.1163/22134379-90003781>
- Mandal, S. (2017). The influence of organizational culture on healthcare supply chain resilience: moderating role of technology orientation. *Journal of Business and Industrial Marketing*, 32(8). <https://doi.org/10.1108/JBIM-08-2016-0187>
- Marvasti, A. (2018). Research methods. In *The Cambridge Handbook of Social Problems* (Vol. 1). <https://doi.org/10.1017/9781108656184.003>

- Muliawan, M. S. D. (2017). THE UNDAGI LEXICON IN THE MANUFACTURE OF RESIDENTIAL HOUSES BASED ON ASTA KOSALA KOSALI CONCEPT IN DENPASAR. *RETORIKA: Jurnal Ilmu Bahasa*, 3(2). <https://doi.org/10.22225/jr.3.2.341.90-96>
- Naranjo-Valencia, J. C., & Calderón-Hernández, G. (2015). Building a culture of innovation. A proposal for cultural transformation. *Estudios Gerenciales*, 31(135). <https://doi.org/10.1016/j.estger.2014.12.005>
- Neuman, W. L. (2011). *Social Research Methods: Qualitative and Quantitative Approaches*. In Pearson Education.
- Nurjani, N. P. S., & Dwijendra, N. K. A. (2020). How traditional balinese houses can adjust and cater for international tourist in the Canggu Area, Bali Indonesia? *International Journal of Psychosocial Rehabilitation*, 24(3). <https://doi.org/10.37200/IJPR/V24I3/PR201901>
- Nuryanto, Dwijendra, N. K. A., Paturusi, S. A., & Adhika, I. M. (2021). Technic and mystics of tukang wangunan in sundanese traditional houses in indonesia (Case study: Baduy tribe community-banten). *Civil Engineering and Architecture*, 9(2). <https://doi.org/10.13189/cea.2021.090226>
- Oka, I. M. D., Astuti, N. W. W., & Suparta, I. K. (2021). Undagi Farmers Village. *Proceedings of the International Conference on Applied Science and Technology on Social Science (ICAST-SS 2020)*, 544. <https://doi.org/10.2991/assehr.k.210424.021>
- Pacheco-Mangas, J., de Las Olas Palma-García, M., & Hombrados-Mendieta, I. (2020). Resilience and organizational culture of social services in the era of digitalization. *Prisma Social*, 29.
- Primadewi, S. P. N., Sueca, N. P., Dwijendra, N. K. A., & Siwalatri, N. K. A. (2021). Emerging architect's design method in designing tourist accommodation case study: Tourist accommodation in Ubud, Bali. *Civil Engineering and Architecture*, 9(2). <https://doi.org/10.13189/cea.2021.090201>
- Putra, I. D. G. A. D., Dwijendra, N. K. A., Paturusi, S. A., & Mahendra, I. M. A. (2019). Elements of the Cultural Space as a Form Identity of Klungkung Urban Area, Bali, Indonesia. *Journal of Social and Political Sciences*. <https://doi.org/10.31014/AIOR.1991.02.02.86>
- Schalk, M. (2014). The Architecture of Metabolism. *Inventing a Culture of Resilience. Arts*, 3(2). <https://doi.org/10.3390/arts3020279>
- Shamsuddin, S. (2020). Resilience resistance: The challenges and implications of urban resilience implementation. *Cities*, 103. <https://doi.org/10.1016/j.cities.2020.102763>
- Sifatu, W. O., Sjahrudin, H., Fajriah, Y., Dwijendra, N. K. A., & Santoso, A. (2020). Innovative work behaviors in pharmacies of Indonesia: Role of employee voice, generational diversity management and employee engagement. *Systematic Reviews in Pharmacy*, 11(2). <https://doi.org/10.31838/srp.2020.2.105>
- Skevington, S. M., Bartos, M., Bonicato, S., Fleck, M., Fang, Kamel, M., Chandra, P., Bisht, D., Amir, M., Brambilla, L., Tazaki, M., Omolo, Gostautaitė-Midttun, N., Ismail, H., Lucas, R., Eisenmann, M., Meesapya, K., Elbi, H., Skevington, S., ... Underwood, L. (2020). Is Culture Important to the Relationship Between Quality of Life and Resilience? Global Implications for Preparing Communities for Environmental and Health Disasters. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.01492>

- Strijker, D., Bosworth, G., & Bouter, G. (2020). Research methods in rural studies: Qualitative, quantitative and mixed methods. *Journal of Rural Studies*, 78. <https://doi.org/10.1016/j.jrurstud.2020.06.007>
- Sugiyono. (2009). *Sugiyono Metode Penelitian Kuantitatif Kualitatif. Metode Penelitian Kuantitatif Kualitatif*.
- Sugiyono. (2015). *Sugiyono, Metode Penelitian dan Pengembangan Pendekatan Kualitatif, Kuantitatif, dan R&D*, (Bandung: Alfabeta, 2015), 407 1. In *Metode Penelitian dan Pengembangan Pendekatan Kualitatif, Kuantitatif, dan R&D*.
- Sugiyono. (2016). *Memahami Penelitian Kualitatif*. Bandung: Alfabeta.
- Suryawan, I. P. P., & Juniantari, M. (2021). Undagi Bali Ethnomathematic Study and How to Acquire Its Knowledge . *Proceedings of the First International Conference on Science, Technology, Engineering and Industrial Revolution (ICSTEIR 2020)*, 536. <https://doi.org/10.2991/assehr.k.210312.064>
- Suyoga, I. P. G. (2020). *Praktik Yoga Arsitek Bade: Membaca Praktik Yoga Penglukunan Dasa Aksara Undagi Bade*. *JURNAL YOGA DAN KESEHATAN*, 1(2). <https://doi.org/10.25078/jyk.v1i2.1574>
- Theron, L. C., Liebenberg, L., & Ungar, M. (2015). Youth resilience and culture: Commonalities and complexities. In *Cross-cultural advancements in positive psychology*; Vol 11; ISSN: 2210-5417 (Print), 2210-5425 (Electronic) (Vol. 11). <https://doi.org/10.1037/t23633-000>
- Ungar, M., Brown, M., Liebenberg, L., Othman, R., Kwong, W. M., Armstrong, M., & Gilgun, J. (2007). Unique pathways to resilience across cultures. *Adolescence*, 42(166).
- Ungar, M., Clark, S. E., Kwong, W. M., Makhnach, A., & Cameron, C. A. (2005). Studying resilience across cultures. *Journal of Ethnic and Cultural Diversity in Social Work*, 14(3–4). https://doi.org/10.1300/J051v14n03_01
- Wicaksana, I. B. A. (2018). The {Art} of {Space} and {Architecture}; {Asta} {Kosala} {Kosali} and {Asta} {Bumi}. *Bali Tourism Journal*, 2(1).
- Wirawibawa, I. B. G., Putra, I. D. G. A. D., & Dwijendra, N. K. A. (2021). *Memadamada: The Power Relation and Architectural Creativity of Gianyar Palace*. *Civil Engineering and Architecture*, 9(3). <https://doi.org/10.13189/cea.2021.090336>
- Wirayasa, N. M. A., & Dwijendra, N. K. A. (2021). Socio-Physical Transformation towards Sustainable Urban Morphology through Land Readjustment in Indonesia. *Civil Engineering and Architecture*, 9(3). <https://doi.org/10.13189/cea.2021.090329>
- Yogantari, M. V., & Dwijendra, N. K. A. (2020). Visual exploration using acrylic paint on used fashion items for sustainable use. *International Journal of Psychosocial Rehabilitation*, 24(3). <https://doi.org/10.37200/IJPR/V24I3/PR201902>
- Yusuf, S. A. (2016). Aspects of Architecture Infrastructures Acculturation Function, Form and the Meaning of the Christian Church Building Pniel Blimbingsari in Bali. *ARTEKS : Jurnal Teknik Arsitektur*, 1(1). <https://doi.org/10.30822/arteks.v1i1.22>