

## Utilization of Natural Materials for the Development of UMKM Center Design Concepts in the Wonokromo Religious Tourism Village

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**ABSTRACT:** *Wonokromo Village is one of the villages in Wonosobo Regency. In 2022, the Wonokromo Village government plans to develop a religious tourism village because of its potential, such as its location in the middle of Java Island and the many kyai figures who are buried here. In the context of village development, investment is needed in the form of additional facilities to improve tourism support services, one of which is the UMKM center. The design of UMKM centers has the potential to maximize the economic potential of the Wonokromo Village community, thereby improving the quality of the community's economy. The purpose of designing UMKM centers is so that people have a place to sell their handicrafts to visiting tourists. This design uses natural materials because they are considered durable, easy to find, and environmentally friendly. In addition, the selection of natural materials is based on ease of finding. The result is the application of natural materials to the UMKM center buildings, namely natural stone, which is applied as walls in private areas, and bamboo, which is applied as part of the structure, roof trusses, and finished in the form of partition walls in the trading area.*

**Keywords:** natural materials, religious tourism village, UMKM center

### INTRODUCTION

#### Background

Wonokromo Village is one of the villages located in Mojotengah District, Wonosobo Regency. Wonokromo consists of three hamlets, namely Wonokromo 1 Hamlet, Wonokromo 2 Hamlet, and Jambu Hamlet. The population is 3,020, the majority of whom work as farmers. Agricultural products are dominated by rice, vegetables, and secondary crops. Others are developing the snakefruit plantation sector, where snakefruit plantations are considered more profitable than planting rice and secondary crops. Apart from agricultural products, the village community also produces handicrafts in the form of plywood.

As a village, Wonokromo has several potentials that can be developed into a tourism village. One of them is that some Indonesian people believe that the midpoint of the island of Java is in the village. This theory is also supported by several popular articles, such as GNFI, which states that the midpoint of Java Island is at coordinates 7°19' S and 109°54' E. (goodnewsfromindonesia.id, accessed at 14.00 WIB, February 1, 2023) When viewed from Google Maps, it is not far from the Dieng Plateau tour, about 21 km to the south. Another potential is the large number of previous *Kyai* and saints who are buried in the village.

The Wonokromo village government is currently working on a religious tourism village development program that will begin at the end of 2022. This idea is motivated by the potential of the village, which can be developed to become the carrying capacity of the village's independence. To support the government program and the economy of the people of Wonokromo Village, additional tourist facilities are needed, one of which is an UMKM center.

UMKM centers are business activity centers in certain areas or locations where there are UMKMs that use the same raw materials or facilities, produce the same or similar products, and have prospects to be developed to become an integral part of the cluster and as an entry point for cluster development efforts. (Permenkop UKM No. 23, 2005) The concept of empowering UMKMs through a central approach is defined as a model for strengthening, developing, and growing UMKMs through grouping based on type of business. This is based on the premise that the mass UMKM coaching model is considered to be very ineffective and seems to be spending the budget. The design of UMKM centers utilizes natural materials as the main material. The reason for choosing materials from nature is because natural materials have characteristics that are strong, durable, and not harmful to oneself or the environment. In addition, natural materials are quite easy to find around Wonokromo Village with prices that are easy to reach.

### **Design Purpose**

The design of UMKM centers with a concept that utilizes natural materials aims to provide a means of empowering the economy of the Wonokromo Village community, as well as supporting facilities for the Religious Tourism Village, and to support the independence of villages that use local natural materials to increase locality values.

## **LITERATURE REVIEW**

### **Definition of UMKM Centers**

According to the definition of the Minister of Cooperatives and Small and Medium Enterprises No. 23, 2005, SME centers are business activity centers in certain areas/locations where there are UKMs that use the same raw materials/facilities, produce the same/similar products and have prospects to be developed into an integral part of the cluster and as an entry point) of the cluster development effort. The criteria for UKM Centers are:

- a. there are at least 20 (twenty) UKMs, with adequate production capacity in a central area that has prospects to be developed into an integral part of the cluster
- b. have a minimum sales turnover of Rp. 200 million/month
- c. have good market prospects
- d. has a network of partnerships in the procurement of raw materials and marketing
- e. able to absorb a minimum workforce of 40 (forty) people in the central area
- f. prioritizing local (domestic) raw materials
- g. use appropriate technology in efforts to improve product quality
- h. availability of supporting facilities and infrastructure.

### **Definition of Nature**

Nature, or what in English is called "nature," comes from the Latin "Natura" which means "essential quality or innate disposition". In ancient times, nature had the meaning of "birth". The word Natura itself is a translation of the Greek word "physis (φύσις)," which relates to the innate characteristics of plants, animals, and various other features in the world. In various uses of the word, nature is often associated with geology and wildlife, which refer to animal and plant life, as well as processes related to inanimate matter, such as weather, geology, matter, and energy. (Wikipedia, accessed at 14.00 WIB, 1 February 2023).

In his writings, Benyus (2002) discusses the properties of nature and how we can learn from these traits to create better innovations. The following are some of the characteristics of nature discussed by Benyus:

1. Sustainability: Benyus emphasizes that nature has learned to create sustainable ecosystems where every element is interdependent and contributes to a sustainable balance

2. **Efficient:** Nature is also known for its efficiency in using resources and energy. Benyus points out that every living organism has developed a unique method to minimize waste and optimize the use of resources.
3. **Adapt:** Nature's ability to adapt to changing environments and conditions is amazing. Benyus emphasized that evolution has produced various species that can adapt to their environment through natural selection.
4. **Innovative:** Benyus pointed out that nature has created various kinds of creative solutions to solve problems, such as discovering species that can produce their own light or species that are able to photosynthesize in very low light conditions.
5. **Dependence:** Every living organism in nature is dependent on one another in various ways. Benyus emphasized that nature has taught us the importance of dependence and cooperation to create a sustainable balance.

### **Definition of Natural Materials**

Mahastuti, N.M.M. (2016), in his journal, defines natural material as material that occurs by itself directly from nature in its original form. It is used as a building material without changing its physical appearance; it's just that in placing it on a building, it requires adjustments such as size, shape, color, and so on. Natural materials give an intimate, cool, and homely impression, as can often be seen in the traditional architectural forms of an area (Bali, Java, Toraja, and so on). In another sense, Oe (2012) defines environmentally friendly materials as building materials with fewer transformations or technological changes that do not damage the environment and do not interfere with human health. The definition of environmentally friendly materials itself generally concerns the product side of the material itself. (Mahagarmitha & Amaral, 2017) Meanwhile, ecological or environmentally friendly materials, according to Wulfram I. Ervianto (2013), are materials that come from nature and do not contain harmful substances to health, such as natural stone, wood, bamboo, and clay. (Dianita, Sucipto, & Sutrisno, 2014) So it can be concluded that based on the three experts, natural materials are materials that do not occur through artificial processes or fabrication but occur purely by themselves and have natural properties that are environmentally friendly.

### **Types of Natural Materials Commonly Used in Buildings.**

#### **1. Natural stone**

Natural stone is a rock that comes from nature, usually used as a foundation, interior constituent materials, and exterior constituents, especially for the finishing process. (Lestari, n.d.) All types of stone are natural rocks, but not all stones can be used for construction needs. (Farah, 2016) Several types of natural stone that can be used as building materials include river stone or mountain stone, such as marble, andesite stone, slate stone, granite, palimanan stone, and temple stone. The properties of natural stone for buildings include:

- Has high compressive strength and flexural strength
- Hard and not easily crushed.
- Water absorption is relatively small.
- Resistant to weather influences
- Resistant to wear and tear

(Amalia, Martina, & Riyadi, 2018)

#### **2. Wood**

Wood is the part of the plant that hardens due to lignification. (Alfari, n.d.) Wood is usually used as a building structure, both foundation and roof truss. In addition, wood can be used as a complementary element, such as floors, walls, frames, etc. Types of

wood commonly used for buildings are teak, merbau, camphor, bengkirai, coconut, and meranti. The properties of wood according to the use class for buildings include:

- High strength wood with light weight, even solid wood will be durable and long lasting.
- Resistance to electricity and chemicals is quite good.
- Wood is a natural thermal insulator which is very effective in isolating cold and heat and is also a good absorber of noise.

(Adianto, 2020)

### 3. Bamboo

Bamboo is a herbaceous plant, with fibrous roots whose stems are round, hollow, segmented, hard, and tall (between 10-20mm), used as a building material for houses and household furniture. Bamboo has the characteristics of being elastic and not easily broken, so it can be used as a structure or complementary material, such as foundations, floors, walls, and roof trusses. However, unlike wood, bamboo has a more complicated connection process. The types of bamboo commonly used in buildings are apus bamboo, Petung bamboo, and Wulung bamboo. The properties of bamboo include:

- According to research, bamboo is stronger than concrete in structure.
- Has good physical and mechanical properties
- Easy to split, cut and shape.
- The fiber is elastic, optimally withstands tensile, compressive, shearing and bending loads.
- Apparently artistic
- Relatively inexpensive
- Not polluting
- Environmentally friendly because it has a life cycle of less than 6 years.
- Able to prevent landslides, erosion, and floods.

- Light

(Alfari, n.d.)

### 4. Foliage

Leaves are the part of the plant that grows in strands on the branches. The use of leaves which is a material from vegetation materials can absorb CO<sub>2</sub>, so the use of this material in buildings can help reduce CO<sub>2</sub> emissions into the atmosphere (Karyono, 2010). Leaves such as tepus leaves, mareme, patat lipung, pinding totot, snakefruit leuweng, Kirai, sago, and kawung fibers are used as roofs for houses (Rahayu & Harada, 2004). Aside from being a roof covering, leaves are usually used as wall coverings.

## DESIGN METHOD

The UMKM center design employs descriptive and qualitative methods to analyze the background and existing problems and is supported by the use of existing theories as discussion material. After that, a solution is formulated, which is described descriptively with supporting images. The stages used in this method are:

#### a. Problem identification.

This stage involves identifying the problems that need to be solved and the goals to be achieved. Problems are derived from the identification of community needs related to the development of religious tourism villages.

#### b. Determination of Design Ideas.

At this stage, initial ideas for solving problems or achieving goals are formulated. After identifying the needs of the community, a design idea was chosen, namely the UMKM center.

c. Data collection.

After the initial idea was developed, data collection was carried out to obtain data for processing. The data was obtained from field observations and direct interviews with the Wonokromo Village government and was supported by literature studies related to the design.

d. Analysis.

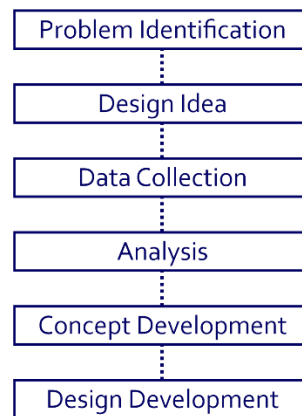
The collected data is then analyzed to identify the required design, such as through demographic analysis, resource allocation, site conditions, material conditions, and user goals.

e. Concept development.

Once the analysis is complete, more detailed concepts are developed. This stage includes refining the initial idea and selecting the right design concept.

f. Design Development.

This final stage involves developing an architectural design in accordance with the selected concept, involving design refinement, and developing technical drawings.



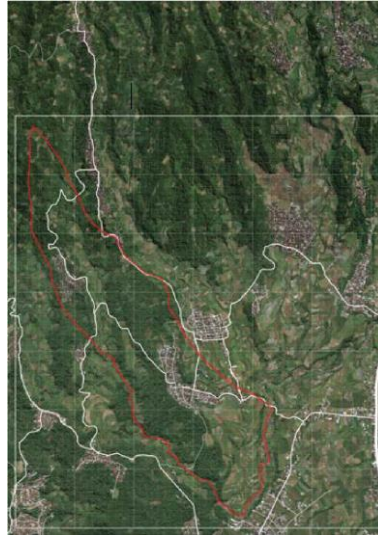
**Image 1** Schematic design method

Source: Author, 2022

## STUDY

### Environmental conditions

Wonokromo Village is one of 19 villages (*kelurahan*) in Mojotengah District, Wonosobo Regency. Mojotengah District itself covers 4,507.52 hectares, and 4% of the area is Wonokromo Village. Wonokromo village itself covers 180.3 hectares, of which 38.3 hectares are rice fields and the remaining 30 hectares are rain-fed rice fields. Besides rice fields, 15.18 hectares are yards, 33.44 hectares are dry land, and 0.23 hectares are ponds. In Wonokromo village, there is no state forest, but there is a community forest of 66 hectares and 8.35 hectares that are neither rice fields nor community forests. There are 68.2 hectares of agricultural land and 123.21 hectares of non-agricultural land.



**Image 2** Wonokromo Village area  
Source: google maps, 2022

### **Analysis**

#### **1. Demographic Analysis**

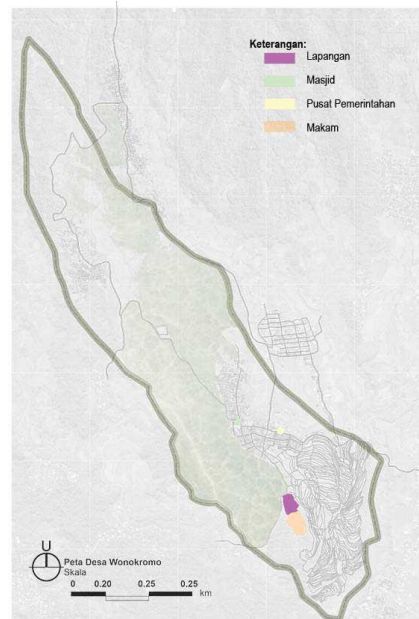
Of the total population of Wonokromo Village, which amounts to 3020 people, the average population of the village is of productive age or working age. The livelihoods of the population are dominated by the agricultural sector as farm laborers. Agricultural commodities include rice and secondary crops, and others are developing the snakefruit plantation sector, which is considered more profitable.

#### **2. Resource Analysis**

All villages in the Mojotengah District are classified as independent villages, villages with the classification of self-sufficiency, or villages where the community has been able to utilize and develop natural resources and their potential in accordance with regional development activities. Wonokromo Village consists of 18 RTs and 6 RWs and is divided into two hamlets, namely Dusun Jambu and Dusun Wonokromo. Apart from that, Wonokromo Village also has a village treasury area of 11,104 hectares, consisting of 9,359 hectares of paddy fields and 1,745 hectares of vacant land.

#### **3. Site Analysis**

The site is located in the field area of Wonokromo Village in the southern part of the village, which is the center of the tourist village area. More precisely, the UMKM center kiosks are planned to be designed around the field. This area is bordered on all sides by dense forest, while in the south there are also rice fields apart from trees. The village field area is also directly adjacent to the tomb to the south.



**Image 3** Site Location  
Source: author, 2022



**Image 4** Site Condition (Wonokromo Village Field)  
Source: author, 2022

#### 4. Material Condition Analysis

Wonokromo Village's environment is still dominated by trees. Therefore, natural materials such as wood and bamboo are still easy to find in the village. At the same time, stone and wood were common materials in the village. This is also reinforced by the number of buildings (houses) that use this material as a basic construction material.

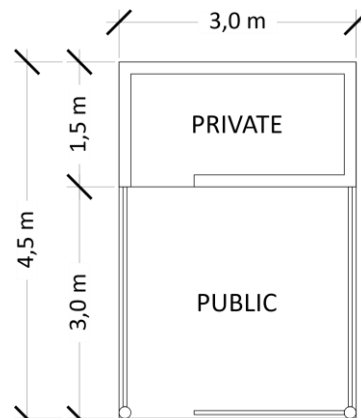
#### 5. Target User Analysis

The design of the UMKM center is to sell and market handicrafts and souvenirs to tourists visiting tourist villages. While the seller is a native of Wonokromo Village itself.

### Design Concept

The design idea is an UMKM center intended for the people of Wonokromo Village to sell various types of handicraft products to visiting tourists. Based on the type of user, the activity zone can be categorized into private and public zones. The private zone is the seller's private space intended for sellers to rest. On the other hand, the public zone functions as a trading space, namely as a space for placing and offering merchandise. The use of a size of 3

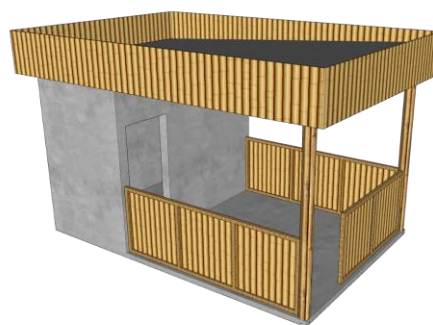
x 4.5 m is based on the need for space that is not too much so that the available space can be maximized as best as possible.



**Image 5** zoning division  
Source: author, 2022

The design of the UMKM center in Wonokromo Village is made using natural materials. The use of natural materials is meant to make these materials easy to find, especially around Wonokromo Village. In addition, natural materials are environmentally friendly, inexpensive to maintain, and easy to replace if damage occurs due to age. Natural materials used in this building are natural stone and bamboo. Natural stone has strong properties and can be used for structural and finishing materials, while bamboo has elastic properties and is not easily broken. Like stone, bamboo can also be used as a structural or complementary material; even in structure, bamboo is considered stronger than concrete.

The use of two materials enables the establishment of clear boundaries between private and public zones. Materials such as cement and natural stone are used in private zones, while bamboo materials are used in public zones, namely trade areas. Larger bamboos, such as Apus or Wulung bamboo, with a diameter of 10-15 cm are used as structures and building frames, while smaller bamboos, such as Tali bamboo, are used as walls or partitions. The Bamboo Tali is divided into 2 parts to form a partition, which is then varnished to maintain the durability of the bamboo while retaining the natural color of the bamboo.



**Image 6** Design Result  
Source: author, 2022

In addition to utilizing natural materials, UMKM centers apply an open design to maximize airflow and provide natural views around the building that visitors and UMKM traders can enjoy. The design is elongated with a linear circulation system. Circulation in a linear system



supports the use of UMKM centers in the long term, so that the current number of stalls totaling six booths can be increased following a long and continuous pattern as the number of UMKM members increases.

The use of natural stone has random patterns and sizes that are applied to public areas as a finishing floor surface so that it feels as if the user is setting his foot outside the room. The random nature of natural stones gives a more dynamic impression with high diversity. High diversity is a natural trait that is brought to the public area. The chosen natural stone has a natural color ranging from dark gray to black, depending on the condition of the natural stone found near Wonokromo Village. In addition, the rough texture of natural stone provides an anti-slip function in the circulation area, so the risk of danger when wet does not increase.



**Image 7** Design Result  
Source: author, 2022

## RESULTS

The UMKM center in the Wonokromo Religious Tourism Village has an open nature and uses natural materials. The design concept has several advantages, including:

1. Connection with nature,  
Buildings with an open nature and made of natural materials are more connected to the surrounding environment. This can provide a more beautiful and natural atmosphere and help reduce the negative impact on the environment.
2. Better air circulation Buildings with open properties have better air circulation. This is because air can flow freely through the building and bring fresh air into the room. In this case, natural materials such as bamboo can help improve air circulation.
3. Better natural lighting.  
Buildings with an open nature also have better natural lighting. Sunlight can enter the building and provide sufficient lighting during the day.
4. Attractive aesthetic appearance.  
The use of natural materials in buildings can provide an attractive aesthetic appearance. Materials such as bamboo and natural stone can give a natural impression and add value to the overall appearance of the building.

5. Health and comfort.

Natural materials such as bamboo have properties that can help create a more comfortable and healthy atmosphere. This material can help regulate humidity and temperature, as well as provide a sense of calm and peace to the occupants.

### CONCLUSION

The results of designing UMKM centers with the application of natural materials to UMKM buildings are that natural materials have strong, durable, inexpensive properties and are easy to find, especially in Wonokromo Village. Natural materials used in this building are natural stone and bamboo. Natural stone materials are used in private areas, namely interior spaces, while bamboo materials are used in public areas, namely trading rooms. The use of natural materials in the UMKM Center building produces designs that are connected to nature, have good natural lighting, are aesthetic, and are environmentally friendly.

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