

Research Article

## Vernacular Architecture for Enhancing Environmental- A Case Study of Housing in Abu Al Reesh Village in Egypt

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Received 05 Dec 2020, Accepted 05 Feb 2021, Available online 10 Feb 2021, Vol.11, No.1 (Jan/Feb 2021)

### Abstract

*Vernacular architecture clearly expresses the strong relationship between man and his surrounding environment, as it represented a mirror reflected the material and human requirements and components of the environment that corresponds to it. From the standpoint of vernacular architecture which is compatible with the environment came as a contemporary innate expression of the reality of place and time, we are trying in this paper to come up with a clear definition of vernacular architecture and the features that characterized it as an attempt to add the human touch to modern architecture, and this is done by studying the vernacular architecture of and analyzing factors Influencing its urban formation, then exposure to the vernacular design of residential buildings and the extent of their environmental and cultural compatibility. The paper concludes with analysis, deduction and evidence that vernacular architecture produces a distinctive local character whose built environment is compatible with local nature and cultures and this is what supports the individual's sense of belonging, as it is man's success in adapting to his environment that enables humanity to communicate and continue.*

### Purpose of the study

- *Determining the features and characteristics of vernacular architecture by analyzing an architectural example of an Egyptian village with a vernacular architectural character*
- *Study the extent to which vernacular architecture is compatible with the environment as an aspect of the natural aspects and the human aspect such as customs, traditions and religion*
- *Emphasize the importance of preserving vernacular housing as it is considered a local heritage*
- *Take advantage of the Vernacular architecture method in dealing with humans and the environment in designing our modern architecture and using technology*

**Keywords:** Vernacular architecture, Local architectural Image, Abu Al- Reesh village , vernacular dwellings.

### Introduction

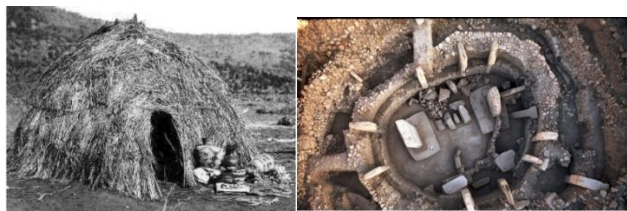
Throughout history, mankind has distinguished himself in art and architecture, expressing his life, believes, and existence, in order to achieve his desire for cultural immortality, to let the following generations learn from it. Architecture belonging to the environment and society is characterized by formative characteristics related to climate, believes, culture and skills, and groups agree among themselves to respect this structural system in its development to be within the limits of environmental needs, tastes and resources, and thus emerged the local and national architectural Image. (Shokry, 2006). So nowadays, even in our speedy technological progress and urbanization, there's still a lot of to find out from the traditional knowledge of vernacular building.

These low-tech methods of creating homes that are perfectly suited to their surroundings are brilliant, because they are principles that are mostly ignored by mainstream architects.

The history of vernacular architecture goes back to ancient times, since the human begin his life on the earth and begin to build his house from mud as a local building Material in order to provide protection from the summer heat and the cold of winter, even he didn't have technological techniques to create more advanced architecture rather he relied on what is available in the surrounding natural environment ,so he used mud and trees to create his house and because of it was a successful start to build a house the idea was popularized and became the character of the stone age buildings, so the pioneers of contemporary architecture in the early part of this century considered that the vernacular architecture is an important and

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DOI: <https://doi.org/10.14741/ijcet/v.11.1.5>

necessary source for the revival of the modern architecture movement. (ElMosalamy, 2011)



**Figure 1:** shows vernacular architecture in ancient times using local building Material

Architects in worldwide dealt with term vernacular architecture with several concepts and expressions in their writings, including (Traditional architecture, popular architecture, Local architecture, Environmental architecture, Architecture Human) all expressed it in the concept of the local building material used, such as mud material make a mud architecture. (ElMosalamy, 2011)

### 1. Definition of vernacular architecture

The vernacular architecture is

- A broad popular concept for fields of architectural study that include indigenous, indigenous, ancestral, rural and ethnic architecture, and contrasts with more general architecture that is called literary or formal architecture.

- Is a term referring to this type of architecture that is local to a specific time or place and is not imported or copied from another place.

- is a term used to classify architecture and building methods that use locally available resources to meet needs and reflect local traditions.

And all of these definitions evolve over time to reflect the environmental, cultural and historical context in which they are found. (Kamouna, 2010)

- Ronald Brunskill defined the vernacular architecture as: "A building designed by amateurs without any design training; one will be guided by a series of conventions that have been built in their area, with little regard for what might be familiar. The function of the building will be the dominant factor, and considerations. Aesthetic, although present to some extent in a small degree, is very minimal. Local materials will be used as a matter of course, as other materials are exceptionally selected and imported." (Brunskill, 1971)

- Alan Noble argued in "A Comprehensive Survey of Structural Forms and Cultural Functions" in which he presented scholarly opinions that (Vernacular) popular construction or popular architecture is based on "people not trained in building the arts"; Where Vernacular architecture is built by ordinary people, but it may be built by trained professionals with the use of local traditional designs and materials, as for traditional architecture is engineering that is

transmitted from person to person, generation to generation at any level of society, not just by the general public. People. Noble discourages the use of the term primitive architecture as a synonym for spontaneous architecture, given that it has a negative connotation. The term popular architecture may be used more as a synonym for Vernacular and colloquial architecture. (Noble, 2007)

### 2. The vernacular architecture and an environmental architecture

We use the vernacular architecture as an environmental architecture because of both of them uses environmental materials such as stone, clay, and clay architecture are an extension of the earth and confirmed the connection of man to his land, and this architecture formed the technical and cultural roots of traditional architecture.

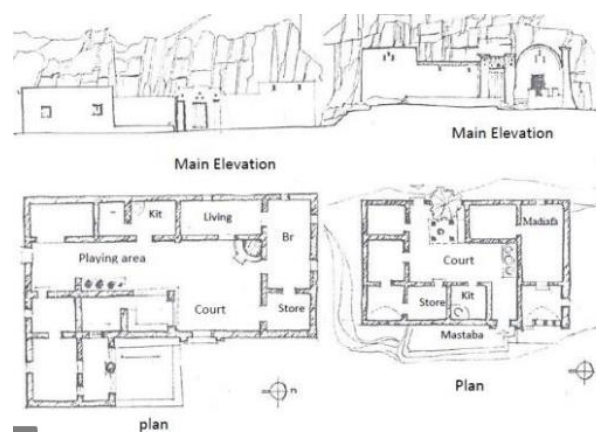
And, the vernacular architecture doesn't apply exclusively to historical architecture nor to non-western, but it is an important field of study called American Vernacular architecture that surveys and classifies housing in rural areas, urban areas and suburbs in the United States. (Ramoda, 2000)

### 3. Features of vernacular architecture

#### 3.1 Flexibility and participatory

One of the most important features of vernacular design is that it is flexible, agreeable and meets needs. The internal spaces that provide freedom of choice and ease of fulfilling the changing needs and desires of families over time are also sustainable.

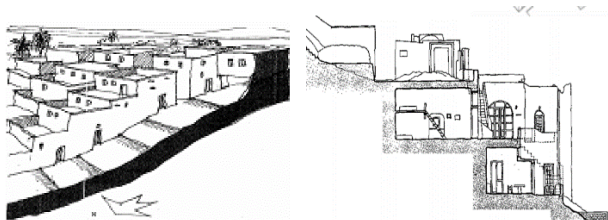
. as Rabeneck remarks, "we must accept the fact that people have the right to their private domain inside which they live as they wish in security and that the housing priorities should reflect the rising expectations of occupants in terms of better designs for choice and durable, resilient housing stock amenable to adaptation" (Kazimee, 2009)



**Figure 2:** A model of the dwellings in Egypty, It consists of one floor and the yard in these dwellings is considered to be the future extension of the family

### 3.2 Symbiosis with the environment

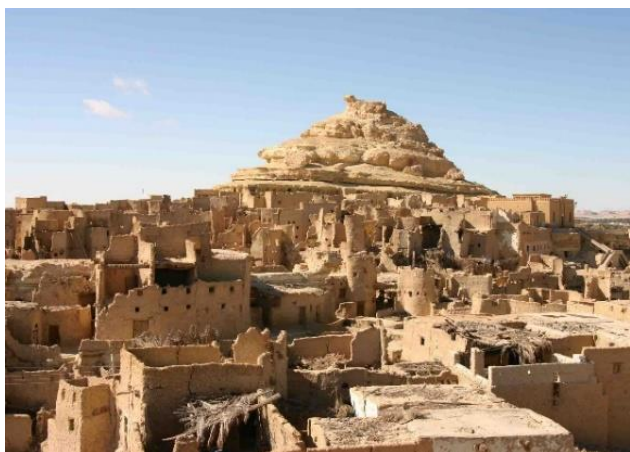
Vernacular design aspires to a symbiotic relationship between humans and the surrounding environment. Being aware of climatic factors and topographical features of the site in which a building is located can create a special local identity. And that by taking advantage of the building's orientation in terms of exposure to solar energy, and wind. (Ibrahim, 2019)



**Figure 3:** Shows the principle of symbiosis between the building and the environment through compatibility with the topography of the site in the graded mountainous areas, so the building was of two levels, graded with the gradation of the site in automatic agreement.

### 3.3 Self-sufficiency

It should be considered the use of local technologies and materials. As local materials are less expensive and readily available, compared to imported industrial products. Local materials and simple manufacturing techniques are suitable for a wide range of people in order to maintain their basic needs of products at reasonable prices. As well as preserving old products and adapting them to new uses.



**Figure 4:** The Siwa Oasis buildings, built using local rare material salt-based called "karseef."

## 4.Aspects of vernacular architecture

The reality of vernacular architecture can be analyzed in two basic aspects: the environmental aspect and the human aspect. (ElMosalamy, 2011)

### 4.1 Firstly, The Environmental aspect

The natural environment is everything that surrounds man of natural conditions and that has a great impact. Since ancient times, the human mind has been concerned with adapting to the conditions of the environment. Groups and individuals agree - willingly or involuntarily - to respect this architectural and formal system, while developing it within narrow limits with different needs, tastes and materials. Thus, arises the spontaneous architecture and the architectural character. (Ola Ali Hashim, 2017)

#### 4.1.1 Climate

Climate has an important effect on vernacular architecture as climatic conditions are related to human life and daily activities. Whereas, since the Caliph began trying to adapt to the natural climate, climatic conditions are a fundamental factor in the process of Vernacular construction, as man builds to protect himself from climatic phenomena. Therefore, the exterior and interior shape of the building and its orientation depend on those climatic factors with the intention of creating suitable conditions for humans. (Jamil, 2007)



**Figure 5:** shows how the shape of the building and its orientation depend on climatic factors

#### 4.1.2 Location

The elements of the site are represented by (topographical, geological, and geographical elements), and these elements have a great role in the visual formation of the architectural character.

##### 4.1.2.1 Geological factor

It is intended by the geological composition of the environmental soil, as some environments are rich in natural stones, clay soil, or mineral raw materials, so they are the main source of building materials and industrial raw materials. The geological factor is represented in the nature of the building materials in terms of the suitability of the materials used for construction with the nature of the land. (Haddad, 2013)

For example, in areas rich in trees, we often find buildings in wooden architecture, while areas that do not contain much wood may use mud or stone. (Ibrahim, 2019)



**Figure 6:** example for wooden building in the area which is rich with trees and wood



**Figure 7:** Example for mud buildings where areas have a mud as its raw material

#### 4.1.2.2 Geographical factor

It means the properties granted by the nature of some of the sites, there are coastal sites and other dominated by forests and another desert. Where the nature of the land that was held by the Urban Communities Offer no effect of terrain for sites is limited to the general shape of the fabric of urban in terms of identifying road networks and corridors vary, but reflected also shows on the nature of building materials and the way of architectural expression. Determining the nature of the way of living life inside and outside the void, whether in terms of openness to the inside as in the desert cities or the openness to the outside as in the highland cities.



**Figure 8:** the nature of the sites like the coastal sites and desert effects on general shape of the fabric of urban

#### 4.2 Secondly, The Human and Cultural aspect

The architectural product in spontaneous architecture is affected by the characteristics of society, whether individuals or societies that have a specific culture, and therefore it plays a fundamental role in shaping their architecture. Through that culture, a person can deal with his environment through his intimacy.

Consequently, it affects his decisions in shaping his built environment, as the design of that environment is the result of a set of choices and decisions selected from many alternatives. These choices express the image of the community itself through the formation of its architecture, the coordination of the site, the quality of the materials used all those outcomes are linked to his culture, customs and traditions, and in which he performs his various activities

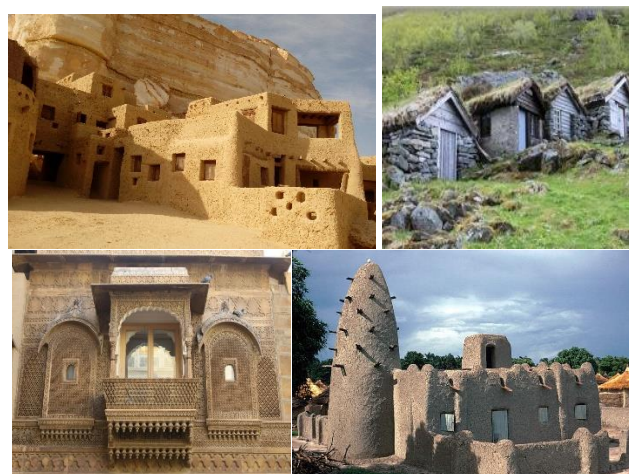
And we can more explain the Human aspect through studying the Culture and Traditions aspect. (Haddad, 2013)

##### 4.2.1 The Culture aspect

The way of life and use of the occupants of the building has a great influence on the shape of the building. The size of the family, which lives in the same spaces, how they prepare and eat, how they interact with people, and many other cultural considerations will influence the appearance of the buildings on the layout and size of the dwellings. (Ibrahim, 2019)

Culture also has a great influence on the appearance of spontaneous buildings, as residents often decorate buildings according to customs and beliefs

What distinguishes societies in a separate way from the rest of other societies is their culture, or what we call cultural symbols, it includes language, thought, religion, customs, traditions, myth, laws, values and customs. This culture is made by many factors and components, some of which are inherited from the past, others are products of the present, and some result from contact with other societies.



**Figure 9:** Different vernacular buildings with different Cultures

#### 4.2.2 The religious aspect

The religious aspect has a clear impact on the architectural product, such as what is in the Pharaonic civilization in terms of interest in the afterlife and their belief in the post-mortem life. Time and appearance, and the use of clay in residential building

And also, the psychological impact of a sense of awe and submission, in proportion to the religious concept, was reflected on the character of the temple buildings in terms of the magnitude of the building and the gradual decrease in the spaces until reaching the Holy of Holies, followed by the various beliefs and religions until we reach the traditions of the Islamic religion and what it has. Urbanization, including and privacy.

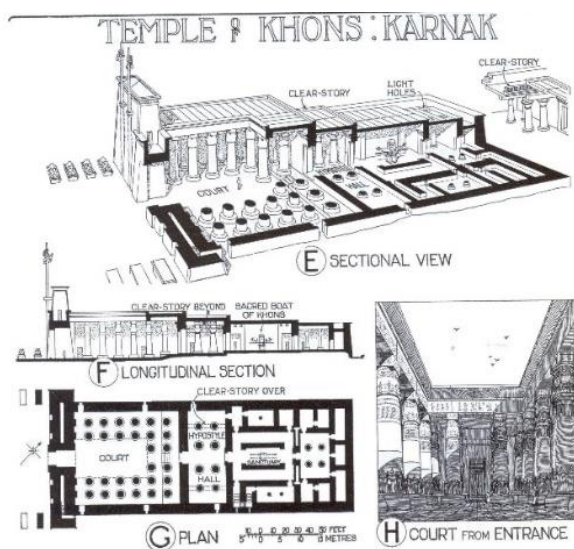


Figure 10 sense of awe and submission, by using the gradual decrease in the height of spaces in ancient Egyptian temples

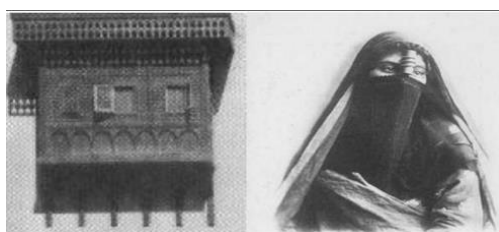


Figure 11: the traditions of the Islamic religion and privacy by using Mashrabya.

#### 4.2.3 Social Aspects

Social factors are those values that are related to the behavior of the human being and his relations with others and with society. There is an interrelation between society and the constructive outcome where both are affected and affected. The social aspects include customs, traditions, human relations, and the standard of living of individuals in the society and its culture.

- Customs and traditions: They are everything related to human behavior and actions that are dealt with and transmitted from one generation to another until it becomes the agreed method of dealing and the change in customs and traditions depends on the religious factor, the cultural level, and isolation from the surrounding world.
- Human relations: It is represented in the extent to which the residents of the area are linked to the collective activities related to the economic, material and cultural level of the society.
- Standard of living depends on the cultural and material level and the extent of openness to the surrounding environments.



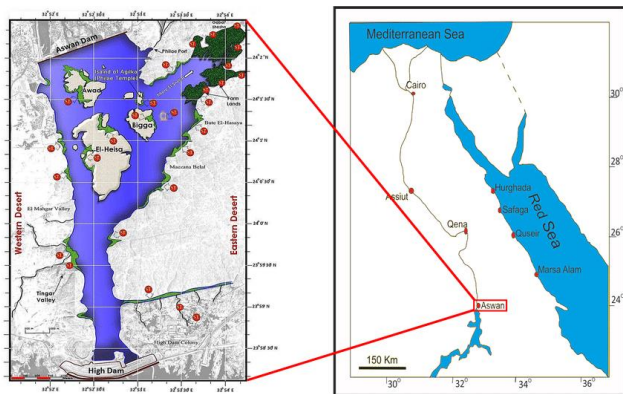
Figure 12: Models of houses in South Africa and Egypt reflect the distinctive culture of the place in the style of decoration of the facade

### 5. Case Study: The Village of Abu El-Reesh, Egypt

#### 5.1 Definition of Abu Reesh village - Egypt

The village of Abu El-Reesh - Egypt is a village of a Vernacular architectural nature resulting from environmental conditions, needs and special social conditions, all these circumstances determined the form of the village's Vernacular dwelling Just as the religion followed in most of the village is Islam, this was also reflected in the shape of the buildings and their design style. (El-zayat, 2002)

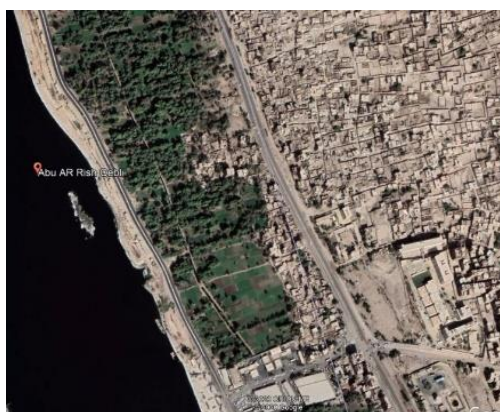
It is one of the villages in Aswan Governorate, which is in southern Egypt and is considered an important tourist attraction because it contains Pharaonic monuments and important landmarks such as the High Dam.



**Figure 13:** The location of Abu Reesh village - Egypt

**5.2 The geographical location of the village of Abu Al-Reesh**

The village of Abu Al-Reesh is one of the villages of Aswan Center in the Aswan. Which located exactly in the northern part of Aswan Governorate and is bordered on the east by the Eastern Desert and on the west by the Cairo-Aswan Road and agricultural lands to the Nile River. It is one of the very hot areas in summer with relatively cold winters. (El-zayat, 2002).



**Figure 13** Abu Reesh village in the west by the Cairo-Aswan Road and agricultural lands to the Nile River

**5.3 The emergence of the village of Abu Reesh**

The name of this village is due to a righteous man named (Muhammad Abu Al-Reesh), who was the first to live in the village

The village is inhabited by several Arab tribes who had an important role in shaping and organizing the architectural and urban style of the village.

**5.4 Architectural description of the village**

The general planning of Abu Al-Reesh is characterized by organic planning

The surrounding buildings and streets are in a geometrically irregular texture that forms almost a single block of buildings with some yards, all buildings have one or two floors at most.



**Figure 14:** The organic planning of Abu Al-Reesh Village and the surrounding buildings and streets are in a geometrically irregular

The residential buildings in the village of Abu Al-Reesh in Aswan are characterized by the presence of internal spaces that are compatible with the social life in the village, such as holding parties or events which called (Al-Malaga). (Mahmoud Ahmed Abdellatif, 2003).





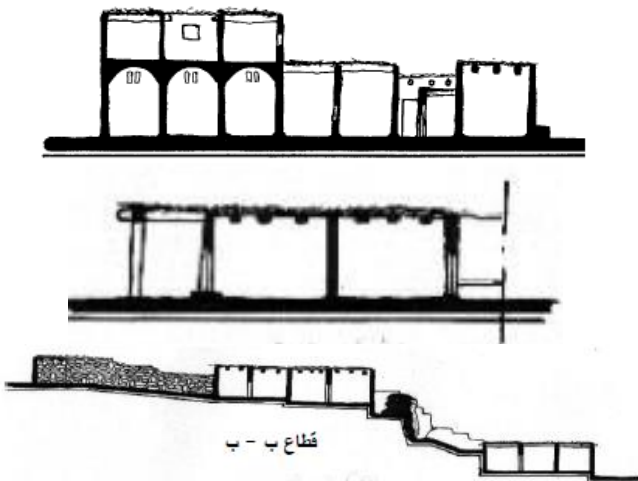
**Figure 15:** (Al-Malaga) The internal spaces for the social life in the Abu Al-Reesh village

*5.5 The architecture in Abu Al-Reesh village is compatible with the environment*

The vernacular housing in Abu Al-Reesh village is characterized by its compatibility with the surrounding environment, and this is evident through.

*5.6 Site topography*

We see that the buildings in the village of Abu Al-Reesh dealt well with the topography of the site, where on flat lands we find one-level dwellings, while in lands that have heights and depressions, we find two-level buildings, and we also find buildings with different levels corresponding to the shape of the land.



**Figure 16:** the buildings in the village of Abu Al-Reesh dealt well with the topography of the site

**Figure 17:** The buildings of Abu Al-Reesh village depend on local materials such as mud and stones

**Compatibility with site geology**

The buildings of Abu Al-Reesh village depend entirely on local building materials such as mud and stones, and this is what makes there a perfect compatibility between the building and the geology of the site. (Mahmoud Ahmed Abdellatif, 2003).

And this compatibility and the use of these local materials makes there is a more suitable for climatic factors and conditions where contiguous buildings and low heights create a wide range of shades, so they maintain the temperature in summer and in winter, which achieved excellent climate compatibility without any costs.

The walls in dwellings are about 50 cm thick and consist of clay-coated stone, which is considered an excellent thermal insulation, and also the ceilings are domes, as they provide a greater percentage of shades and make the temperature inside the house appropriate without relying on any industrial air-conditioning.

#### Compatibility with social life

The customs, traditions, and folklore of the residents of Abu Al-Reesh have affected the form of housing, where we see housing as a direct response to the needs of the population.

For example, Privacy is one of the most important constants of the people of the village and we see this achieved through the large thickness of the walls that does not allow the transmission of sound from the inside or from the outside. The buildings are all within the boundaries of one or two floors, which helps preserve the principle of fertility

It is worth mentioning the construction method in the dwellings of Abu Al-Reesh village depends heavily on the inhabitants of the place itself, as the people cooperate with each other and through their own efforts in building their homes and providing food and drinks to each other, which constitutes an integrated social environment.

#### Conclusion and recommendations

- The style of vernacular architecture in building is a very good style that helps in preserving the environment and improves human and social relations as it provides many environmental resources.
- The style of vernacular architecture in design is a style that suits each region separately according to its local building materials and the culture and customs of its residents
- It is necessary to reconsider the design method of vernacular architecture buildings to be used in our current architecture, but with modern technological methods compatible with the age.
- Vernacular architecture is the gateway to truly sustainable architecture that protects the environment and the environmental resources
- The necessity of teaching students in universities and architectural institutes the necessity of using local building materials and building everywhere according to the culture of its population to make a successful architecture
- The necessity to avoid demolishing old buildings and build other modern buildings that do not fit with the culture or history of the place and do not use local building materials

- The need for international organizations and bodies such as UNESCO to adopt the revival of old villages and cities that depend on vernacular buildings

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