



University of Structural Engineering and Architect "Lyuben Karavelov" - Sofia,  
Faculty of Architecture, Department of Urban Planning, Theory and History of  
Architecture Study and exploration of vernacular residential architecture in the

# METHOD FOR STUDYING OF VERNACULAR HOUSING STRUCTURES AND TECHNOLOGIES WORLDWIDE

## **Dissertation**

for awarding educational and scientific degree "DOCTOR", in the professional  
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Kliment Stefanov Radoev, architect  
/ doctoral student in free training /  
Prof. Ph.D. arch. Borislav Borisov  
/ scientific consultant /  
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**The dissertation is organized in three chapters.**

**Chapter "I Theoretical basis of the study";**

**Chapter "II. Developed and studied examples "and;**

**Chapter "III. Theoretical analysis.**

**Two appendices are proposed to the dissertation:**

**1. Maps and;**

**2. Glossary.**

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## CHAPTER I. THEORETICAL BASIS OF THE STUDY

... which clarifies the study's object, subject, goals, objectives, and scope. It outlines the sequence and methods of the study. Along with a look at the topic relevance, research on the topic of other authors, their contribution and these achievements that can be used in this work are mentioned.

### 1. INTRODUCTION

Vernacular houses (also called folk houses), representing that part of history for which we - the designers have no contribution or control, are the source that gives us genuine and honest information about what architecture is as a product of a natural evolutionary process. By "genuine and honest" is meant not only "authentic" but true in the philosophical sense of the word. Vernacular houses are unreasonably underestimated because of their seemingly primitive technologies, but which is preferable - modern technologies that tempt human vanity or those that are in harmony with nature? The methodology in this work does not provide a recipe for "what we should do", but rather a position on "how we should perceive", in the same way that evolution itself has no ultimate goal but is stable and sustainable and has always been a product of what even we represent.

The primary impression from the first steps in this research was that there are no uniform criteria or established systems for researching vernacular houses worldwide. Even less is there to study the specific architectural properties of vernacular houses or the premises that have formed the houses. It is a universal phenomenon and applies not only to specific cases but is valid worldwide. The entry of globalization into the world brings its pros and cons. One of the positives in the context of the topic is the need for such a research system. Unfortunately, with much greater absolute value, the negative is the real danger of losing the architectural knowledge for constructing vernacular houses and all the resulting and accumulated intangible values in time.

#### 1.1. SUBJECT OF THE RESEARCH

Creation of a methodology for research and classification of *vernacular houses* around the world.

This methodology is a tool for creating a unified system for research of *vernacular the houses* world, which is possible for professionals to apply in "open-source" format. This provides an opportunity to explore *vernacular, houses* taking into account the details, subtleties, features of the subject in a place that is impossible from a distance.

use and handling of knowledge about *vernacularthe houses*.

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The lack of such a system could be compared to the lack of a periodic table of chemical elements or different periodic tables in different parts of the world.

## **1.2. CURRENT STATE OF THE PROBLEM**

Most research related to vernacular houses emphasizes the way of life, the quotidian and the subsequent spatial features of the building.

An in-depth description of the structure of vernacular buildings is rare. When there is one, it is usually at a popular level. The same goes for knowledge about the technological process of construction. The nature of vernacular buildings implies their construction in three possible ways described in the paper.

Specific authors emphasize in their research a sequence and / or a set of specific aspects of a specific place. Different types of vernacular houses are usually untenable, so the study here pays special attention to a balanced and comprehensive approach, which is clarified by the work method.

The collection of information about a particular type of house by a specific author is approached with care. In other cases, the know-how of the vernacular house is in most cases passed on by word of mouth between father and son or community members, so finding information is difficult. Many of the findings here are based on visible marks from photos, movies, professional articles, and the general and logical connection between them are derived from at least a few examples of each type of house and supported by numerous scientific sources.

Vernacular architecture is always associated with a place whose boundaries and features are not always explored and proven. It is a serious problem that rarely has a solution or is relative and unclear when asked.

Different authors collect information about specific types of vernacular houses. For one, the layout and composition are analyzed almost entirely. For another, the architectural outlook is commented on, and for the third the materials, etc. - things that are incomparable with each other. By extracting systematic knowledge, it becomes possible to compare common features, study the few different features or study "complete" uniformity, which is the only reliable mechanism for obtaining a scientific result.

From these problems follows the exceptional relevance of such a topic. The need for systematic research on certain features, criteria and scientific means would be relevant to other sciences. Conclusions that we can draw from the evolutionary processes forming a vernacular house related to modern requirements for energy efficiency and environmental friendliness in houses are particularly important.

This work aims to present information closest to the concept of Lawrence in a systematic scientific and correct form. The approach chosen here excludes some very detailed factors and includes (and groups in different ways) others that this approach proves to be significant.

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## **1.3. GOAL AND TASKS OF THE DISSERTATION**

### **1.3.1. RESEARCH GOAL**

This work aims to develop a scientific and theoretical apparatus - a methodology for systematically collecting, comparing, and analyzing information about vernacular houses systematically.

#### **1.1.1. RESEARCH TASKS:**

- Collection of complex (balanced) information about the architecture of vernacular houses.
- Designing a matrix. The knowledge of vernacular houses is systematized through it.
- Defining common premises that led to the existence of a type of vernacular house.
- Defining common architectural properties representing the essence of a vernacular house type.
- Study of the significant relationships between premises and properties. Their degree of importance. Their gradation in taxonomic systems.
- Arranging the studied categories in a system of knowledge representing a theoretical model of the methodology for research of vernacular houses.
- Determining types and kinds of houses to them according to certain properties. Taxonomy of vernacular houses. Naming. Defining rules for creating a nomenclature of vernacular houses.

## **1.2. OBJECT OF THE DISSERTATION**

### **1.2.1. OBJECT**

Vernacular houses around the world are the object of this work. Definitions of "vernacular", "building", "family", and "house" are clarified below, following the goal and based on the studied sources and examples of vernacular architecture.

### **1.2.2. RANGE**

#### **Method**

The current method is a system of complex approaches for finding, collecting, analyzing, arranging in taxonomy and naming a representative sample of vernacular houses evenly distributed worldwide. It systematizes a complete and

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generalized knowledge of the houses through the presented way, providing an opportunity for various subjects of future research.

## **Research**

Dissertation research refers to the knowledge that the respective type of house exists, which or what social groups inhabit it, its approximate location with the known climate, materials and resources of the place and historical period.

The investigation has a detailed analysis of the building itself, including all aspects of the study and using a matrix described and explained later in the work.

## **Vernacular residential architecture**

By vernacular residential architecture or vernacular home or vernacular family housing is understood here as the definition of vernacular - residential buildings that are vernacular as defined in the attached dictionary but considered indefinitely. The period has no starting point. The period has an endpoint - one in which some of the signs of authenticity or features of the concept of "vernacular" are lost, or in which the building ceases to be built by the community due to globalization, external influences, wars, use of modern materials, etc. The subject of the study is the endpoint and the period immediately before it. Another possible possibility for the endpoint of the period is if the building continues to exist and evolve, ie to be built and used for living. The subject of research, in this case, is the present moment.

## **House or building.**

As for the definition house - family building for living of one person up to three, four generations of one family, members of one family;

## **Geographical boundaries**

According to the geographical boundaries of the study, the work covers examples from around the world without claiming to cover all examples from one place or Region. Pursuing credibility and the possibility of generalization requires at least a few fully developed examples from the continent. The study includes 30 developed buildings in 13 examples and 64 studied, according to the adopted approach to studying vernacular houses.

## **Scientific aspect**

The work, according to the scientific aspects of the study, is architectural and covers knowledge from the fields in this order of importance: architecture, building, architectural structures, architectural technology, building physics, climatology, geography, biology, taxonomy, anthropology, ethnology, physics, anthropometry, materials science, statics;

## **Types of information**

The work, according to the type of architectural information, covers knowledge of the Premises for the emergence of houses (individual, social, climatic and resources); knowledge obtained from the analysis of space, composition, construction, form, technology, material, construction product and architectural work; This knowledge is balanced according to the techniques of the methodology itself, which emphasizes the constructive-technological part. Architecture.

For handling and analysis of the above categories of work uses information in the fields of building, architectural structures, architectural technology, urban / rural,

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philosophy and religion, civil engineering, statics, physics, geography, geology, climatology, biology (botany, bionics ), history, anthropology and ethnography.

## **1.3. DISSERTATION SUBJECT**

The subject of this paper is the methodology product of the present study. Such a study does not suggest the possibility of completing it in the framework of this work. The methodology provides the base and the silver line and presents a structure through which the initial information about the vernacular houses worldwide is accumulated, researched, and systematized. Apart from being a mechanism, the methodology should establish an initial data matrix for vernacular houses, which would suggest the possibility of processing and analyzing and subsequently drawing conclusions for a specific house (group of houses). The methodology is open so that the research can continue over time, and it can change, evolving in its structure and the accumulation of information regardless of the subject of the study.

## **1.4. METHOD'S GOAL**

- Establishing the set of Premises that determined the development and design of vernacular houses;
- Establishing the properties and connections between them qualifying vernacular houses;
- Establishing the interaction of the Premises and properties of the house?
- System (taxonomy) for establishing the type, type and family of a vernacular house, which are determined by specific properties;
- Nomenclature (naming) of buildings.
- Area of the house. Outlining the area of distribution of a particular kind, family type vernacular house;
- Creating maps. With a sufficiently large perimeter of types of vernacular houses in an area, it can be formed as a map with the areas where each type occurs. A map can be made according to a specific precondition or characteristic.
- Creating software with capabilities for collecting information and analysis of houses and groups with different parameters to achieve specific desired results;
- Author's analysis. Reaching conclusions that are acquainted with the course of various processes over time: the formation of the house, the establishment of construction and construction technology. Introducing the idea of the evolution of the vernacular house;

## **1.5. TERMINOLOGY**

### **GLOSSARY**

contains a glossary of 62 terms with explanations of their meaning and explanations for the spelling and use of symbols. The terms are also defined on the spot when used directly in the text.



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They are selected so that their use sounds understandable even to those unfamiliar with the specific terminology. Given that in many cases the *vernacular house* for a particular area is called by researchers "people's house", it is logical that the terminology is understandable to the people. folk.

The paper contains a glossary of 62 terms explaining their meaning and explanations in the spelling and use of symbols. The terms are also defined in place when used directly in the text. They are selected so that their use sounds understandable even to those unfamiliar with the specific terminology. Researchers call the vernacular house for a particular area "people's house" in many cases, so it is logical that the terminology is understandable to the people, i.e. folk house.

**The process of structuring the dissertation so far includes:**

**Research topic -> Current status -> Goal and tasks -> Object -> Subject  
-> Method's goal -> Terminology**

## CHAPTER II. DEVELOPED AND STUDIED EXAMPLES

... which presents the developed and studied examples, the sequence and the methods for collecting and processing information; clarifies the concepts of template, matrix and illustrates their meaning and function in a mechanism chosen for the study of houses and their presentation in matrix examples.

### 1. SEQUENCE AND METHOD OF THE INVESTIGATION

Although the general object of research is *vernacular the houses* world, a detailed study of all *vernacular houses* is impossible. On the contrary, the methodology in its completed form is shown by a serious representative sample of *developed and studied examples*, which are used for research, analysis and conclusions for the maximum possible number of *vernacular houses* in the future.

In the whole body of labor the logical sequence of the research is realized through essential assumptions - hypotheses and their proving - their transformation into *these*. In this process, some of the statements previously stated in the hypotheses are dropped, enriched or new ones appear. In the process of substantiation of a hypothesis, smaller steps are used as a thesis, which are derived and numbered as local conclusions. Each conclusion builds on what has been proven in the previous ones. The conclusions concern a specific reasoning or partial study. A summary of another is made on the overall scientific result - chapter or topic. A conclusion is proposed on the achievements of labor as a whole.

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## 1.1. SEQUENCE

It is necessary to accumulate information on the basis of which a null hypothesis is formulated. Its accumulation is in a certain sequence.

The research begins with a pre-created **template** of parameters by which the vernacular house can be studied. *The template* is an organized set of knowledge about the house, the importance of which must be proven.

It is necessary to accumulate information based on which a null hypothesis is formulated. Its accumulation follows a certain sequence.

The research begins with a pre-created template of parameters by which the vernacular house can be studied. The template is an organized set of knowledge about the house, the importance of which must be proven.

## 1.2. TEMPLATE

The preliminary template contains information in areas selected according to previously known postulates and research of cited authors. A preliminary template may consist of parameters by which to conduct the survey such as **name, continent, Region, ethnic group / language group, society, construction resources, climate / environment, habitat, area, scheme, materials, tools, time for craft, requirements, device, space and composition, functional features, construction, technology and materials.**

## 1.3. STUDYING OF HOUSES

A vernacular house is sought in a particular area or by the name of a country, community, locality. The search is conducted via the Internet. The first most important parameters are establishing its name in the local language (or more than one) and the area where it is distributed. The next step is to find scientific literature in books or articles about the respective vernacular house. Data from these literature sources are stored in the template. The study shows that searching for information on the type of vernacular house by country or by

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specific geographical area, in general, does not give outstanding results, but this study usually starts with a geographical area (e.g. country).

## **1.3.1. RESEARCH MECHANISM:**

- 1.** Study starts by a state;
- 2.** The name of the house in the respective language is searched;
- 3.** The name of the same house in the language of a neighboring country is sought; Neighboring countries are checked for the presence of the house type;
- 4.** Repeat this item 3 until the possibilities are exhausted; Note: It is not always possible to find information about the vernacular house in a particular area;
- 5.** In the event that cycles 3 to 5 are not possible in the relevant local language, the search shall be conducted in English, French, Russian or Spanish. An area in which the house exists is outlined. For the Region are checked:

- Name
- Continent
- District
- Ethnic group (s) inhabiting the area; (ethnography and geography)
- Human Development Index; (geography, history and anthropology)
- Religion; (philosophy)
- Natural Resources; (climatology, physics, geography)
- Construction resources; (climatology, physics, geography)
- Climate; (climatology, geography)
- Area; (architecture; anthropology)
- Seismic activity; (geology)
- Significant natural impacts; (climatology, geography)
- Searching for information on:
  - Overview; (philosophy, architecture)
  - Urban; (urban / rural development)
  - Space and composition; (architecture)
  - Functional features, lifestyle; (architecture, anthropology)
  - Structure; (architecture, building structure, architectural structure, architecture technology)
  - Construction (architecture, building structure, architectural structure, architecture technology)
  - Materials; (building, geology, biology, botany, bionics);
  - Tools; (building construction, architecture technology)
  - Construction time; (technology of architecture; civil engineering)
- (due to the availability of all these data in different places, they are collected and interpreted by the author according to the purpose and objectives of the specific study)

All the information is arranged conveniently for its perception and its introduction into a template.

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A study of a second house is undertaken, if possible, with significant visible differences, and the exact steps are repeated. (see Algorithm Fig. 2) In each subsequent study, specific parameters for one house become insignificant for another or vice versa; insignificant parameters for one house turns out to be of grave importance for the next. It follows that the pattern must be changed with each subsequent survey of the house. It reaches a point where the parameters in the template are sufficient and necessary in terms of quantity and quality to study each house. This statement is true of the 94 vernacular houses in this work. In this way, the study of the houses goes hand in hand with the modeling of the template. When the template is "ready", it should be called by another term. This term is "matrix."

## 1.3.2. MATRIX

The study of houses continues as described. All 94 examples of this work have been revised and supplemented according to the parameters of the already prepared matrix.

**30 of the houses are collected in 13 examples and described in detail. That is why they are named developed.**

It is assumed that the **matrix** may be a template for studying a "new" vernacular house. matrix reached after studying all the examples is shown in Figure 1

Continent: XXXXXXXX  
District: XXXXXXXX  
Region/Polyregion: XXXXXXXX  
Zone: XXXXXXXX  
Covers the Countries: XXXXXXXX  
Ethnic Group: XXXXXXXX  
Society: XXXXXXXX

Society (HDI)	Religion	Natural Resources
XXXXXXXX	XXXXXXXX	XXXXXXXX

### Строителни ресурси:

Resource	Water	Stone	Wood	Clay	Straw	Leafs	Leather	Fur	Fabrics
Simbol	A	S	W	C	T	F	D	B	X
	aqua	stone	wood	clay	thatch	folia	derma	bristle	TeXtile
Quantity	X/10	X/10	X/10	X/10	X/10	X/10	X/10	X/10	X/10

Климат/среда: XXXXXXXX  
(Köppen-Geiger)

Climate zone	XXXXXXXX	
Seasones	XXXXXXXX	XXXXXXXX
Average max t°C/t°F	XX°C/XX°F	XX°C/XX°F
Average min t°C/t°F	XX°C/XX°F	XX°C/XX°F
Diurnal difference°C/°F	XX°C/XX°F	XX°C/XX°F
Humidity %	XX%	XX%

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Monthly Presipitation mm	XXXmm	XXXmm
Wind predominant direction	XX/XX	XX/XX
Wind Speed m/s	XXm/s	XXm/s
Ocean Currents	XXXXXXXX	
Natural Influences	XXXXXXXX; XXXXXXXX; XXXXXXXX;	

Popular name:	XXXXXXXX
Family:	XXXXXXXX
Type:	XXXXXXXX
Kind:	XXXXXXXX
Living:	XXXXXXXX
Area:	XXXXXXXX
Scheme:	XXXXXXXX
Materials:	XXXXXXXX
Tools:	XXXXXXXX
Implementation time:	XXXXXXXX
Requirements:	XXXXXXXX
General:	XXXXXXXX
Urban:	XXXXXXXX
Architectural Space and Composition:	XXXXXXXX
Functional features:	XXXXXXXX
Structure, Technology and Materials:	XXXXXXXX
Kinds:	XXXXXXXX
Popular Facts:	XXXXXXXX

Figure 1. Matrix for studying the vernacular houses.

The other 64 examples are presented by a short description of their most propertyfeatures accompanied by a photo. All 94 houses are collected in Chapter II, a collection of examples.

## 1.3.3. DEVELOPED EXAMPLES

1. Bahay Kubo. Asia South. / Example N1 /
2. Oca Heto Tapera / Karaja South America, South. / Example N1 /
3. Rumah Batak / Toba /. Asia, Southeast. / Example N2 /
4. Rumah Tongkonan / Toraja / Asia, Southeast. / Example N2 /
5. Rumah Batak / Karo / Asia, Southeast. / Example N2 /
6. Bubungan Tinggi. Asia, South. / Example N3 /
7. Darbazi. Asia West. / Example N3 /
8. Glhatun. Asia, West. / Example N4 /
9. Karadam. Asia, West. / Example N4 /
10. Hogan / Navajo /. North America Southwest. / Example N4 /
11. El-Molo hut. Africa, East. / Example N5 /
12. Min) Africa East. / Example N5 /
13. Ev. Europe East. / Example N6 /
14. Zemlianka, Earthlodge, Europe, East; North America, West; Asia, West. / Example N6 /
15. Igloo. North America, North; Asia, North. / Example N7 /
16. Quinzhee. North America, North. / Example N7 /
17. iQhugwaneZulu. / Example N8 /
18. iQhugwaneSotho / Example N8 /

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19. iQhugwaneXhosa / Example N8 /
20. Afar hut, Bukaru Africa, North East. / Example N8 /
21. Bukaru. Africa, West. / Example N8 /
22. Wigwam, Wickiup. North America, West. / Example N8 /
23. Rumah Joglo. Asia, South. / Example N9 /
24. Khaima, Bedouin, Berber tent. Africa, North. / Example N10 /
25. Khune. Asia, Southwest. / Example N10 /
26. Rondavel. Africa, Central and South. / Example N11 /
27. Imba. Africa, South. (Zimbabwe. / Example N11 /
28. Tatta Somba. Africa, Central. / Example N12 /
29. Sukala., Africa, Central. / Example N12 /
30. Troglodyte house. Africa, North. / Example N13 /

## **1.3.4. STUDIED EXAMPLES**

1. Balagan. Asia, North
2. Ballok. Asia, North
3. Berberadobehouse. Africa, North
4. Bungla. Asia, Indian Peninsula, West
5. Bure. Oceania, North, Fiji.
6. Burdei. Europe, East
7. Bushman Hut / SanBushmanHut /. Africa, Southwest
8. Cavate / CliffDwelling /. North America, Southwest; Asia, West; Africa, North
9. Chum. Europe, NorthEast; Asia, Northwest
10. Clochan. Europe, West
11. Dogon house. Africa, West
12. Dorze. Africa, East
13. FujianTulou. Asia, Southeast
14. Goahti. North America, North
15. Hanok. Asia, East
16. Hallenhaus, Fachhallenhaus, Low German house, Low Saxon house. Europe , Northwest
17. HimbaHut / Himba / Africa, SouthWest
18. Izba. Asia, Central and North
19. Jacal / Hohokamhouse /. America, SouthWest
20. Kanak. Oceania, East
21. Khmer house. Asia, South
22. Kümbet. Asia, SouthWest
23. Kuna House. Central America, Panama
24. Kushta. Europe , SouthEast, Asia, West
25. Africa, North
26. LongGouLang sia, South, China, Hainan
27. Manyatta. Africa, East
28. Masia. Europe, West
29. Musgum. Africa, Central;

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30. Nivkh. Asia, North
31. Nyumba / Bomb /. Africa, South
32. Oca Mune / Takuxipan / Timakoto / Tiriyo /. South America, North
33. Oca Paima / Karapapufa / Tiriyo /. South America, North
34. Oca Tampataraka / Taotinto / Tiriyo /. South America, North
35. Oca Kuna Oucuntaka / Tiriyo /. South America, North
36. Oca Xavante. South America, North
37. Oca Antiga / Karaja /. South America, North
38. Maloca Shabono. South America, North
39. Maloca Xinguana (Pah. / Yawalapiti /. South America, North
40. Maloca Takana / Tapirape /. South America, North
41. Maloca Tukano. South America, North
42. Maloca Marubo. South America, North
43. Maloca Srobo / Yucuna, Uitoto /. South America, North
44. Omo Sebuah. Asia, South
45. Plank house. North America, NorthWest
46. Pueblo. North America, SouthWest
47. Qarmaq. (Valkaran in Asia. North America, North. Iceland. Asia, North
48. Ruka / Mapuche /. America, West
49. Rumah Gadang / Minangkabau
50. Rumah Melayu, Asia, south
51. Rumah Radakng (Rumah Pandjang, Uma, Rumah Iban, Rumah Panjabi, Asia long house) /Dayak/) Asia, southeast, Indonesia
52. Sami hut, Europe, north
53. Teepee, North America, central
54. Toda, Asia, South
55. Torfbær Europe, NorthWest
56. Trullo Europe, South
57. Tuareg shelter Africa, North
58. Tuareg tent Africa, North
59. Tukul Africa, South
60. Uma Mbatangu / Sumbanese house / Asia, South
61. Urasa Asia North
62. Wattle & Daub hut.North America, South; Europe, Central and South; Africa, West; Asia, West
63. Yarang a. Asia, North
64. Yurt. Asia, Central

## 1.3.5. STUDIED COUNTRY TERRITORIES. REGIONS.

All developed and studied examples are located in the following countries and continents. They are listed together with the presentation of each house. There is no dependence between the state borders and the administrative subdivision of the world's territories on the one hand and the origin, distribution and

# DISSERTATION ABSTRACT

existence of a particular type of house. The table below is provided for the reader's comprehensibility.

Table 1. Countries and continents containing the Studied and developed examples

	ASIA	AFRICA	SOUTH	NORTHERN	EUROPE	OCEANIA
1	Philippines	Morocco	Chile	Canada	Romania	Australia
2	Indonesia	Tunisia	Peru	USA	Ukraine	Zealand
3	Malaysia	Algeria	Argentina	Mexico	Poland	
4	Papua New Guinea	Libia	Brasile	Panama	Belarus	
5	Russia	DR Congo	Bolivia		Italy	
6	Armenia	Benin	Paraguay		England	
7	Georgia	Togo	Uruguay		Finland	
8	Azerbaijan	Burkina Faso	Colombia		Sweden	
9	China	Cameroon	Ecuador		Norway	
10	Vietnam	Ethiopia			Germany	
11	Iran	Kenya			Bulgaria	
12	Syria	Tanzania			Turkey	
13	Turkey	Angola			France	
14	Japan	Namibia			Spain	
15	Japan	Namibia			Spain	
16	Mongolia	Zimbabwe				
17	Israel	Mozambique				
18	Saudi Arabia	South Africa				
19	Vietnam	Lesotho				
20		Swaziland				

## 1.4. SUMMARY OF CHAPTER II

The research process so far includes:

**Template -> Matrix -> Study of all 94 houses -> Detailed description of 30 of them -> grouping in 13** (due to similarities in a significant number of parameters) **-> Brief presentation of the remaining 64.**

After the presence of a similar collection, observation and analysis are performed in order to form hypotheses. Proving these hypotheses will form the main



# DISSERTATION ABSTRACT

features of the methodology and will fund its development, as is the purpose of the work.

After careful observations and detailed analysis, **impacts or groups of impacts** appear as an imprint in the architecture of many *houses*. Some of them are climatic impacts, certain traditions in the life of societies and individuals, resources in the area, location at altitude (altitude) and others.

# DISSERTATION ABSTRACT

## CHAPTER III THEORETICAL ANALYSIS

### 1. ASSUMPTIONS OF THE VERNACULAR HOUSE

It is assumed that the potential **impact or group of impacts** influencing the architecture of the vernacular house is called *a factor* in the context of this work. The potential impact must be proven, and if this happens, the *factor* becomes a *Premis*. *The Premises* form the architecture of the house in a freeway. It leads to the null hypothesis:

#### NULL HYPOTHESIS:

**EVERY VERNACULAR HOUSE HAS BEEN FORMED FREELY UNDER THE PREMISES, WHICH IS READY**

They are:

CLIMATE;  
RESOURCES;  
RELIGION;  
WAY OF COMMUNITY LIFE;  
PLACE (summarized);  
LEVEL OF SOCIETY DEVELOPMENT IN THE REGION;  
HISTORICAL EVENTS;  
ANTHROPOMETRIC FEATURES OF MAN;

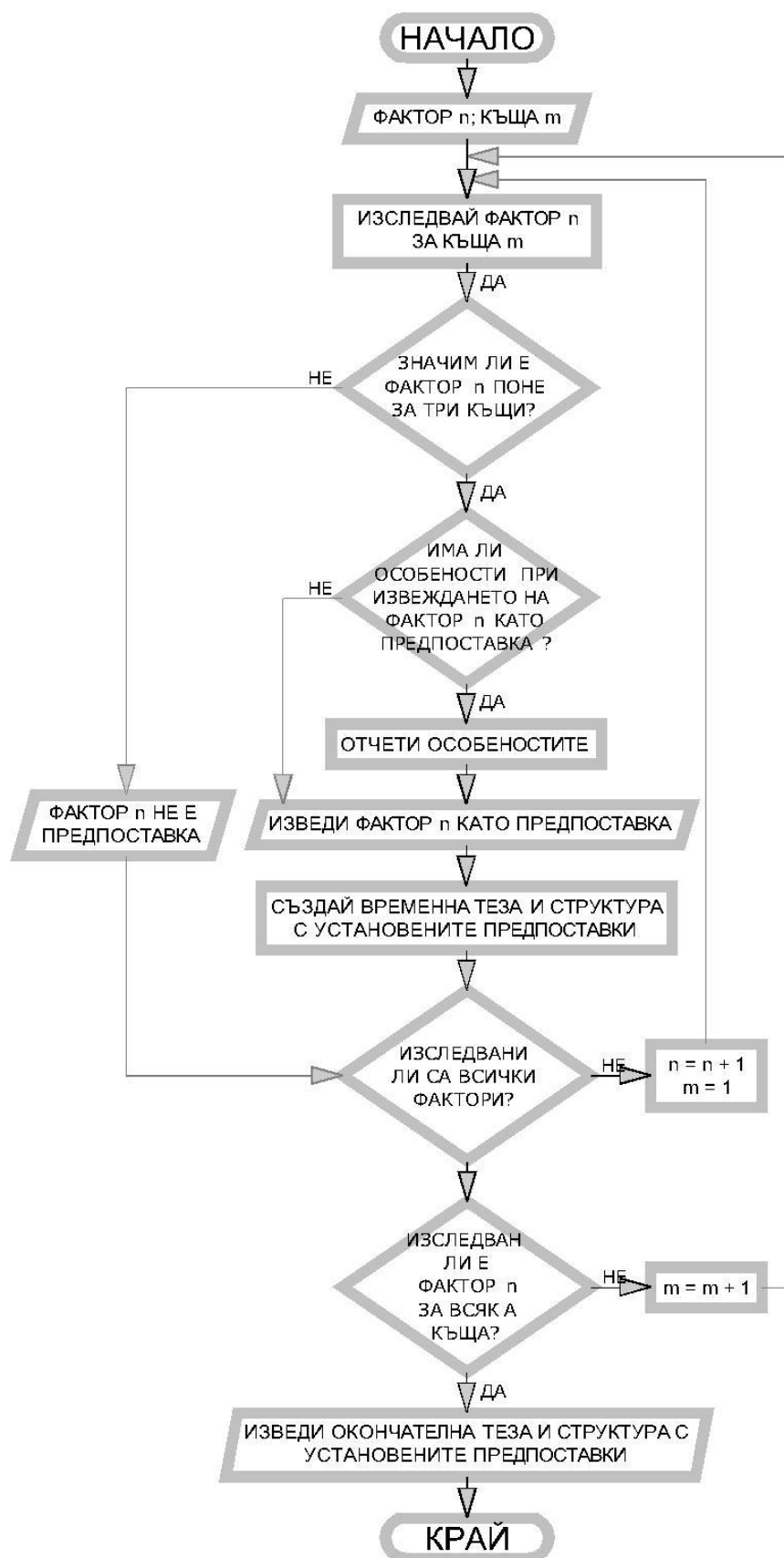
#### 1.1. RESEARCH MECHANISM:

The hypothesis suggests the factors based on well-known theoretical postulates and used literature. Each of them is examined in each *matrix*, ie. from the observation of a *vernacular house* and the visible impact of a factor on it it is assumed that the *factor* is a *Premis*. From its objective impact on at least two other *types of vernacular houses*, it follows that it is significant.

Such a *study* requires a defined and accurate *algorithm* providing a streamlined order of just research and data collection in *a matrix*. This algorithm was created by the author and presented in Figure 2.

# DISSERTATION ABSTRACT

$n = 1$   
 $m = 1$   
 $k = 0$   
 $n, m, k$



# DISSERTATION ABSTRACT

Figure 2. *Algorithm* for studying the *type of* vernacular house.

As a result of studying the factors, there is a classified and organized generalized set (system) at the end of the paragraph. A system of *Premises* with a proven impact on *vernacular houses* in general. This system is shown in a tabular form and the changes that have occurred.

Climate	is derived as a basic Premis
Seasonality	is derived as a Premis
Humidity and precipitation	is derived as a Premis
Seasonal temperature difference	is derived as a Premis
Temperature difference day-night	is derived as a Premis
Air and ocean currents	eliminated. is reported through the other <i>Premises</i>
Natural disasters	are deduced as a Premis
Resources	are deduced as a basic Premis
Water	is deduced as a Premis
Snow	insignificant impact. special case
Earth resources	are derived as a Premis
Stone	is derived as a Premis
Clay	is derived as a Premis
Plant resources	are derived as a Premis
Wood	is derived as a Premis
Animal resources	are derived as a Premis
Animal bones	insignificant influence. special case
Additional materials	are displayed as a Premis
Natural resources are	eliminated.
Lifestyle in the community	is derived as a basic Premis
Individual needs and family relationships	are derived as a new "life of man and family."
Social and legal relationships	are derived as a Premis
Religious rituals, ancestral	influence insignificant influence. is not a Premis
Customs for weddings and funerals	Premis
Human and family life	is presented as a new basic Premis
Degree of development of society in the area	is presented as a basic Premis
Historical events	as a basic
basic	Premis Not a Premis
Location	Not displayed as a separate Premis. It is defined as a global <i>precondition</i>

# DISSERTATION ABSTRACT

	uniting others. It affects the <i>houses</i> only through other <i>Premises</i> .
Place	is derived as a <i>Premis</i> Environment
Location	excluded from <i>Premises</i> and should be considered as an <i>area of distribution</i> outside <i>Premises</i>
Environment	is derived as a basic <i>Premis</i>
Historical environment	insignificant influence. does not represent a <i>Premis</i>
Security	is displayed as a new basic <i>Premis</i>
Development environment	is displayed as a new basic <i>Premis</i>

Table 2. Derivation and change of Premises The

The null hypothesis is proven with some changes and additions clearly stated in **Error! Reference source not found.**

## NULL THESIS:

**EVERY TYPE OF VERNACULAR HOUSE HAS BEEN FORMED *FREELY* UNDER THE INFLUENCE OF *PREMISES*, WHICH COME OUT OF THE NEEDS OF HUMAN AND/OR SOCIETY.**

They are:

CLIMATE;  
RESOURCES;  
WAY OF COMMUNITY LIFE;  
LEVEL OF SOCIETY DEVELOPMENT IN THE REGION;  
HISTORICAL EVENTS;  
SURROUNDINGS;

# DISSERTATION ABSTRACT

## 1.2. SUMMARY OF ASSUMPTIONS

The research process so far includes:

**Proposal for a set of factors -> formation of a null hypothesis -> creation of a research algorithm -> research of each factor for each house (according to the algorithm) -> significant factors are separated as Premises -> grouping the Premises by functionality -> turning a null hypothesis into a thesis.**

After establishing the final set of Premises, they acquire the final form of Figure 3



Figure 3. Scheme - derived *Premises*

## 2. PROPERTIES OF THE VERNACULAR HOUSE

It is observed that the established *Premises* of a similar nature form similar *features* in the architecture of *vernacular houses*. Such similar *features* should be

# DISSERTATION ABSTRACT

grouped into systematic *manifestations* of the architecture of the building, which are hypothesized based on well-known theoretical postulates, used literature and observation of the premises.

The mentioned architectural and physical *manifestations* in *space* and the processes in time that led to their materialization are called *properties* of the *vernacular house*. It seems that the considered *Premises* lead to certain *properties*, so here comes the

## **first hypothesis:**

**EACH TYPE OF VERNACULAR HOUSE IS A COMBINATION OF PROPERTIES THAT ARE A CONSEQUENCE OF ESTABLISHED PREMISES.**

They are:

SPACE

ARCHITECTURAL FORM

ARCHITECTURAL COMPOSITION

ARCHITECTURAL STRUCTURE

TECHNOLOGICAL

ARCHITECTURAL KNOWLEDGE –ARCHITECTURAL

From observing a *vernacular house*, it is assumed that a *manifestation* is a *characteristic*. From its objective existence in at least two other *types of vernacular houses*, it follows that it is significant.

## **2.1. PROPERTIES ARCHITECTURAL FORM**

is presented as a unifying category. It is a product of *architectural construction* and *architectural space* united by *architectural composition*.

The formula expresses this dependence:

<b>FORM</b>	<b>=</b>	<b>SPACE + CONSTRUCTION</b>
		<b>(COMPOSITION)</b>

This statement means that *form* is a unifying *characteristic*, but does not diminish the other parts of the equation. Therefore, after it is considered...

## **2.2. PROPERTIES ARCHITECTURAL SPACE**

Architectural space is the essence of architecture and architectural design and in the case of the evolution of *vernacular houses*. Space as a property has been studied in the literature on *houses*. However, this study is far more effective by all examples, but most notably by Igloo - Musgum - Pah, Izba - Rumah Batak - Rumah Tongkonan - Rumah Joglo, Darbazi - Karadam.

Space exists as a parameter in the matrix.

# DISSERTATION ABSTRACT

These examples can be grouped as houses with a similar scale of spaces, which helps to study the property under different conditions and vice versa. The similarity of other properties and drastic differences in space.

## **2.3. PROPERTIES ARCHITECTURAL STRUCTURE**

By "construction," here is meant the flesh of the building; any matter through which our eyes or body do not pass. Obviously, in such a definition, it is important to distinguish between a load-bearing structure. Construction is in fact the material substance that defines space and without which it cannot be studied. Construction is a parameter discussed in detail in the matrix.

All examples make a significant contribution to the study of the characteristic. But most prominent Izba, Igloo, Bahay Kubo, Rondavel, Khaima, El-Molo, Izba, Sukala.

## **2.4. PROPERTIES ARCHITECTURAL COMPOSITION**

Architectural composition is how the connection between space and construction is realized. In practice, it is a technology of the architectural order; all dependencies in the space-construction relationship.

These conclusions are based on the literary sources mentioned in the paper and no less on all houses and especially on those with similar compositions on the one hand, and very different compositions on the other

Tatta Somba - Sukala; iQhugwane - San Bushman hut Kyshta, Bubungan Tinggi, Joglo, Rondavel - Imba, Darbazi - Glhatun.

Composition is a parameter of the matrix.

## **2.5. PROPERTIES ARCHITECTURAL TECHNOLOGY**

The property has a tangible and intangible expression, which is noticeable as a resemblance to an architectural composition. Technology is again a means, but not of unifying space and construction, but of construction and material. The study includes it as part of the matrix.

Significant examples from which conclusions have been drawn regarding property technology are Bubungan Tinggi, Fujian Tulou, Tatta Somba, Himba hut. Again, a comparative analysis with an equivalent parameter is applied.

## **2.6. PROPERTIES MATERIAL**

It is obvious that the property material is deprived of the definition of "architectural" for obvious reasons. The material, however, is an extremely important feature that is inextricably linked to technology and hence to construction.

The typical materials for the construction of vernacular houses are limited to those that nature offers directly. A table of materials, on the one hand available in the area of the house, and on the other hand typical for its construction, is displayed as a parameter in the matrix.



# DISSERTATION ABSTRACT

The most significant examples that help to derive this property are those with a similar form but made of different materials, such as Rondavel - Rondavel Lesotho - Bungha, Musgum - Dorze, Chum - Goahti - Teepee and vice versa made of one material but with different other properties: Rondavel - Sukala - Berber house.

## **2.7. PROPERTIES CONSTRUCTION PRODUCT**

It is a collective property that contains construction, technology and material, just as a form contains construction, space and composition.

A construction product has more engineering than architectural meaning. A product can be a building element - a brick, a beam, a fragment of the building - a roof, a cage or the body of the whole building. This property represents the material essence of the building without spatial or compositional elements in it. The important connection with the architectural properties is the architectural construction.

## **2.8. ARCHITECTURAL WORK**

It is the sum of an architectural form and a construction product. The work represents the absolute integrity of an architectural unit in every sense of its existence.

Good idea of why *properties* are the real manifestations of *vernacular house* and how they depend on the *Premises* can be obtained from Figure 4, Figure 5 and Figure 6 presented in the paper and here.

# DISSERTATION ABSTRACT



Figure 4. Structural scheme - content of the *properties*

# DISSERTATION ABSTRACT

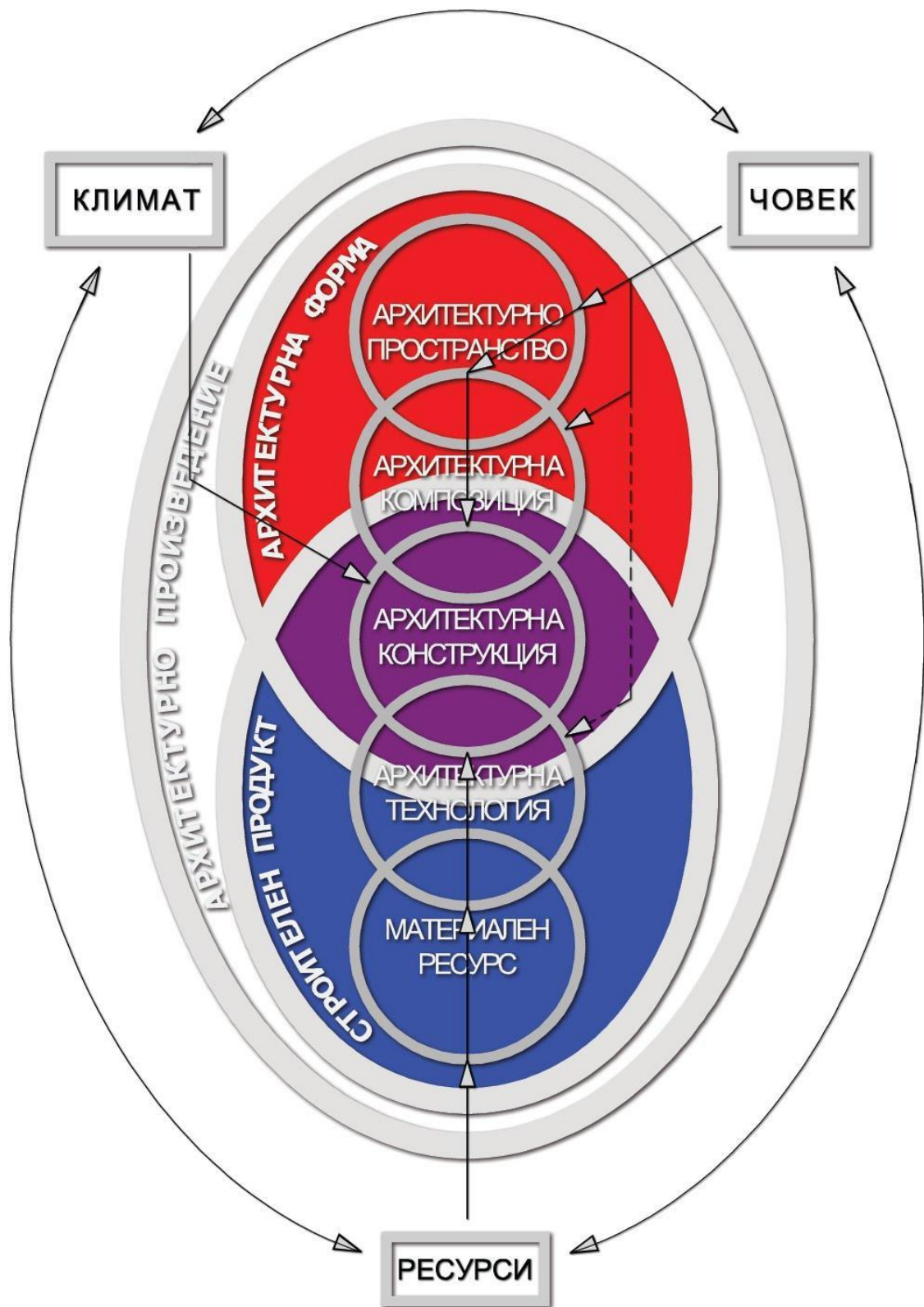


Figure 5. System Architectural Work

# DISSERTATION ABSTRACT

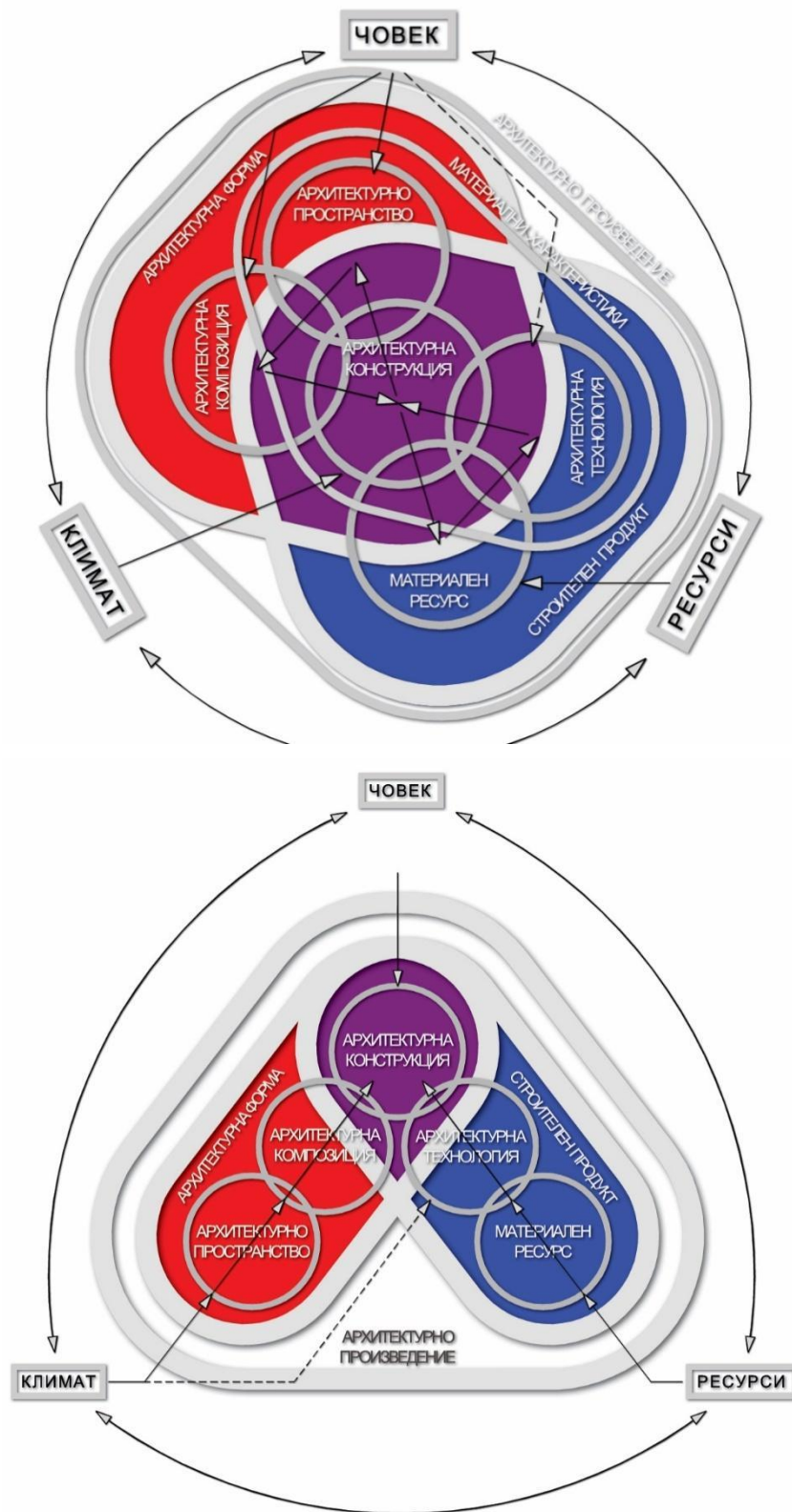


Figure 6. Alternative schemes for the presentation of the system



# DISSERTATION ABSTRACT

In the study of the properties an attempt has been made to differentiate and differentiate as unambiguous the influence of a specific *Premis* on a specific *characteristic*. There are no definite effects on *Premises* - *properties*, but there are main directions in the impact of *Premises*. A certain *precondition* affects **in general**, a certain *characteristic*, but since the *Premises* are connected in the system living and non-living nature, and the *properties* in the system architectural work (vernacular house), both groups show a certain "internal plasticity", i.e. interact with each other in the group.

**Example of Premises:** Sunshine, temperature and its change day and night, humidity (climatic conditions), the presence of certain tree kinds (resources) and certain rules and customs in the way people live are interrelated.

**Example of the properties:** The climatic Premises that mainly affect the house's external form can not but affect the structure, space, etc. as they are bound by compositional and physical laws in a system.

**A direct mathematical or logical correlation between *Premises* on the one hand and *properties* on the other is difficult to observe, but there are definite and clear trends. In general, the system is closed and although there are no specific effects, it is observed that all the *properties* together depend only on all *Premises*. Conversely, *Premises* are the only category of impacts capable of forming the *vernacular house*.**

This means that the *properties* are really a consequence of the *Premises*, which proves the hypothesis and turns it into

## **THESE FIRST:**

**EACH TYPE OF VERNACULAR HOUSE HAS A COMBINATION OF PROPERTIES WHICH ARE CONSEQUENTLY DUE TO CONSEQUENCES.**

They are graded in a hierarchy and are:

ARCHITECTURAL FORM  
ARCHITECTURAL SPACE  
ARCHITECTURAL COMPOSITION  
ARCHITECTURAL STRUCTURE  
ARCHITECTURAL TECHNOLOGY

## **2.9. Summary**

**process of research and synthesis here includes:**

# DISSERTATION ABSTRACT

**Proposal for a set of *properties* first -> study of each *property* with appropriate examples -> significant *properties* are separated -> grouping of *properties* in a system of *architectural work* -> transformation of hypothesis first into thesis.**

Examples of the derivation of each of the properties in the context of the derived Premises and the studied examples are presented. In this derivation a comparative approach is applied with one of the properties equated and the study of the differences in another.

For example:

- For two or more vernacular houses with similar *properties material* and possibly *technology* are studied *construction, space and composition*.
- For two or more vernacular houses with similar *properties form* are researched material or technology.
- For two or more vernacular houses with similar properties and insignificant differences, the premises that led to their formation are studied.

Important conclusions emerge from such a comparative approach with an equivalent parameter.

Analysis of the examples in terms of the relationship between *premises* and *properties* shows that the *properties* of the *vernacular house* are not a constant. They are changeable over time. The change of *properties* depends on the change in the natural environment of vernacular *houses*, or essentially changing the *premises*. This observation is very similar to Darwin's theory of the origin of species.

As a result of the observations on the dependences of the *premises* and *properties* of the vernacular house, a second hypothesis is formed.

### 3. TAXONOMY. FAMILIES. TYPE. TYPE

#### HYPOTHESIS TWO:

**THE VERNACULAR HOUSE IS A PRODUCT OF NATURAL EVOLUTION AND IT IS POSSIBLE TO CREATE A TAXONOMIC CLASSIFICATION SYSTEM.**

#### 3.1. PROPERTIES, PREMISES AND PROPERTIES

The establishment of belonging to one or another species, genus, family in the biological world is based on certain traits. These scars are parts of systematized manifestations. Just as the zebra animal species is characterized by such

# DISSERTATION ABSTRACT

decoration, so biology defines this trait as morphological. Body form, size, etc. are also morphological features. The set of one-system traits is called a trait. In this work was adopted similar to the biological architectural recognition to be called a *characteristic*. Therefore, a parallel is made presented below between the set of features in biology on the one hand and the architectural features on the other in order to serve as a taxonomy.

- **morphological** - the body's form, size, and color are taken into account. (In the *vernacular house* can be associated with **Architectural form**)
- **immunological** - refers to the modes of action of the immune system, determines tissue compatibility. (In the *vernacular house* can be associated with **Architectural construction, Architectural technology and material (Construction product)**)
- **physiological** - organisms must have similar life processes. (In a *vernacular house*, it can be associated with a function, from which follows **Architectural composition** and **Architectural space**)
- **ecological** - their ecological requirements are similar, almost the same. (In the *vernacular house* can be associated with **Climate, Resources, Environment**)
- **geographically** - the range of these individuals coincides. (In the *vernacular house*, it can be associated with **Region**)
- **evolutionary** - the phylogeny of organisms is traced. (In the *vernacular house*, it can be associated with **Architectural technology** and **origin**)
- **ethological** - the behavioral reactions of individuals are observed. (In the *vernacular house* can be associated with **Architectural space**)
- **genetic** - organisms must have the same karyotype. (In the *vernacular house* can be associated with the origin, which includes the development of **all properties**)
- **biochemical** - based on similarities in the structure of proteins. (In a *vernacular house*, it can be associated with the **material**)

## 3.2. TAXONOMY AND TAXONOMIC SYSTEMS

In order to make any classification, it is subject to some taxonomic system, and they are limited in number. Four types of taxonomic systems are studied:

**NON-HIERARCHY DISCRETE TAXONOMY**

**HIERARCHIC NON-DISCRETE TAXONOMY**

**HIERARCHY DISCRETE TAXONOMY**

**NON-HIERARCHIC NON-DISCRETE TAXONOMY**

# DISSERTATION ABSTRACT

For the purposes of architectural taxonomy, a **HIERARCHICAL DISCRETE TAXONOMY** has been chosen. It is supported by inspections, studies of architectural classifications and architectural organizational systems.

## 3.3. RANKS, SIMILARITY AND EQUALITY

To define taxonomic units for architecture, such as in biology "species" (subspecies) "genus," and "family", the term "*rank*" is defined, which is a type of *category* in the taxonomic system. As the ranks for architecture are accepted, respectively, the above "*species*" (*Sub-kind*) "*type*" and "*family*".

There is the task of keeping them as close as possible in terms of names, but there is another task - to be able *vernacular* architecture, also called "folk" with *colloquially folk ranks*. "*Type house*" sounds much more understandable than "kind of house ". Moreover, if in biology the main taxon is "species", then in architecture, it is "*type*", because to create a methodology, we are rarely interested in the specific architectural "individual".

In the context of defining "rank," the concepts of similarity and equality are considered. They describe the boundaries and tolerance in defining "*identical*" or "*similar*" elements, *features*, *houses*, etc.

## 3.4. ARCHITECTURAL FAMILY, TYPE, TYPE, SUB-KIND; TYPE OF DIFFERENCE, VARIATION, DEVIATION IN SIMILARITY

Based on the choice of *taxonomic system*, *rank definition* and the concepts of *similarity* and *uniformity* are re-examined all the *houses* of the *matrices*. The examination of the houses is carried out in the context of the derived *premises* and *properties* until the criteria for determining the ranks are reached, after which tests are conducted to exclude any contradictions. After this extensive analysis and observations, rules have been derived for determining individual ranks, starting with family.

### 3.4.1. ARCHITECTURAL FAMILY

***An architectural family*** is a group of *vernacular houses* that have a similar utilitarian-compositional structure, which is judged by their functional organization and *propertyarchitectural* composition.

It follows:

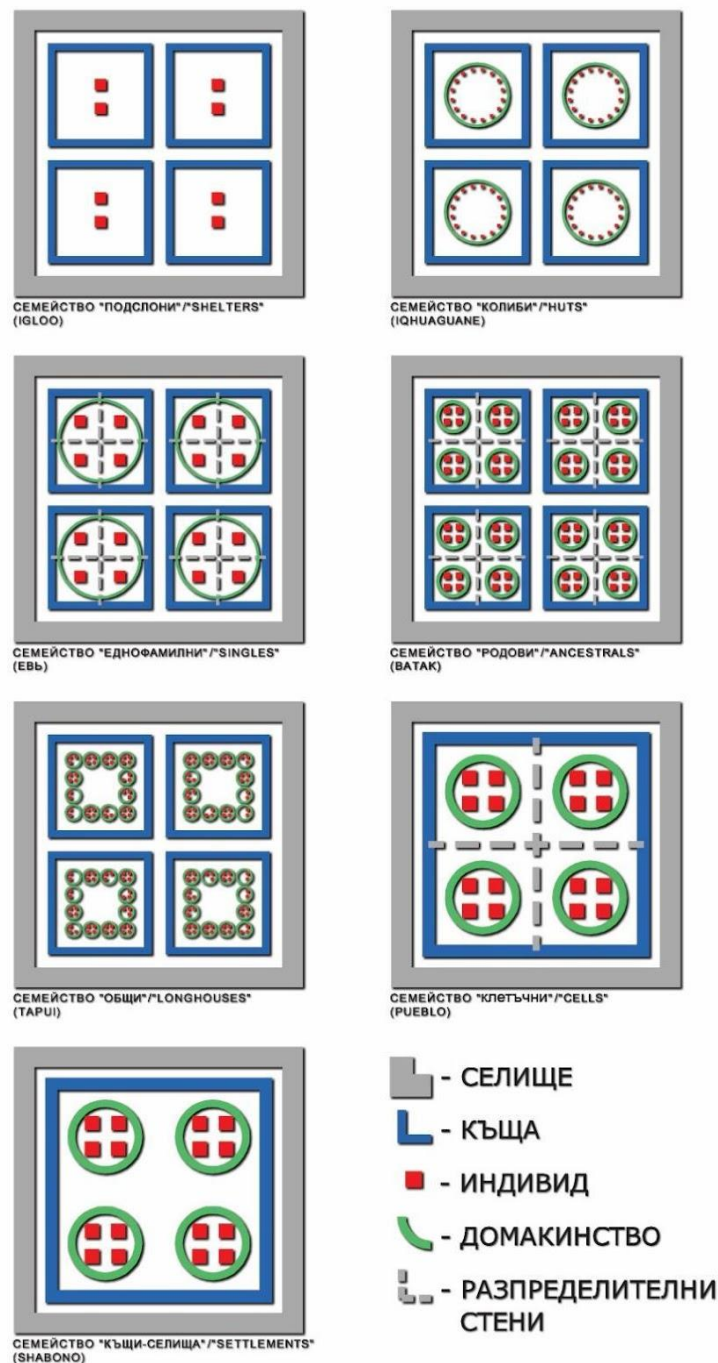


# DISSERTATION ABSTRACT

Two or more *vernacular houses* belong to one architectural family, when they have a similar utilitarian-compositional structure, which affects their functional organization and *propertyarchitectural* composition.

In professional jargon, the criterion "utilitarian-compositional structure" is presented visually through the "functional scheme" of the house. For the purpose of the methodology "functional scheme" is meaningless, as it is only a form of representation of the utilitarian-compositional structure.

The criterion (utilitarian-compositional structure) visible through *an architectural composition* to determine the architectural family is depicted in Figure 7



# DISSERTATION ABSTRACT

Figure 7. Scheme of families with different utilitarian structures and architectural composition. "Shelters" - (Igloo, Teepee, Urasa, etc.); "Kolibi" - (Kuna, Tapera, Heto, Taba, Iquaguane); "Family" (Bahaikubo, Ev, Izba); "Generic" - (Rumah Karo, Bubungan tinggi, Bure,

Figure 8 shows specific representatives of different *architectural families*.



## СЕМЕЙСТВА

Figure 8. Specific representatives of the different *architectural families* according to their utilitarian structure

### 3.4.2. ARCHITECTURAL TYPE

**Architectural type:** is a *rank* uniting a group of *vernacular houses* with similar *architectural construction*, whose *architectural composition* (of a family), respectively form, is also similar.

It follows:

Two or more *vernacular houses* are of one architectural type when in addition to a similar utilitarian structure (*architectural composition*), they have a similar *architectural construction* respectively form.



# DISSERTATION ABSTRACT

Figure 9 and Figure 10 show different representatives of one type.



Figure 9. Houses of one type with similar *architectural form* (iQhugwane, El-Molo, Afarhut, Igloo)



Figure 10. Houses of one type (Rumah BatakToba, Rumah TorajaTongkonan)



# DISSERTATION ABSTRACT

## 3.4.3. ARCHITECTURAL KIND

**Architectural kind** is a rank uniting group of vernacular houses with similar architectural features, architectural construction, architectural composition, architectural technology and material are similar. This means that all five properties are similar.

It follows:

Two or more *vernacular houses of similar form* belong to one *architectural type* when they are *similar in their technology and material properties*. I.e. when they are *similar* in all five *properties*.

Figure 11 shows houses of one type, and Figure 12 shows houses of one type with a visible difference, which explains why they are not even of one type.



Figure 11. Houses of one architectural type



Figure 12. Houses in lowland and mountainous areas. Buildings of one architectural type

# DISSERTATION ABSTRACT

## 3.4.4. ARCHITECTURAL SUB-KIND

**Architectural Sub-kind** is a group of *vernacular houses* in which all architectural *properties* are the same, but they have one or more specific and clear *differences* from the architectural type from which they originate. This *difference* is called *architectural variation* and is less significant than *rank difference*.

It follows:

Two or more *vernacular houses* are of one *ARCHITECTURAL Sub-kind* when they have *similarities* in all five *properties* and a certain pronounced *architectural variation* in relation to *the kind*.

Figure 13 shows the varieties of one kind



Figure 13. Different varieties of the kind "El Molo". With eaves, without eaves and with cornice.

These basic *categories* are complemented by definitions that are essential in *ranks*, such *rank* as *rank (family) difference*, *rank (type) difference*, ( )*kinds*, *difference variation deviation* and *distinguishing at the similarity*.

With this, I think that hypothesis two becomes a thesis:

### THESES TWO: THE

**VERNACULAR HOUSE IS A PRODUCT OF NATURAL EVOLUTION AND IT IS POSSIBLE TO CREATE A TAXONOMIC CLASSIFICATION.**

# DISSERTATION ABSTRACT

## 3.5. TAXONOMY SUMMARY

The process of research and synthesis so far includes:

**Formulation of the second hypothesis -> set of biological features -> analogy with *architectural properties* -> analysis of taxonomic systems -> selection of taxonomic system -> definition of "category", "rank", "similarity" and "uniformity" (elements and tools of the taxonomic system) -> derivation of rank architectural family -> derivation of rank architectural type -> derivation of rank architectural type -> derivation of architectural sub-kind -> transformation of hypothesis first into thesis.**

The taxonomy is represented by a system of ranks in the following hierarchy:

**FAMILY,**  
|  
**TYPE,**  
|  
**KIND,**  
|  
**SUB-KIND**

Creating a taxonomy is extremely important for *vernacular houses*. In reality, only a clear structure could serve to properly analyze the *differences* between them. These *differences*, in turn, are a testament to the way the *vernacular house* has changed over time. And if we do not have direct evidence of this change, we can judge it by the evolutionary structure. The differences following the path of development of a particular *type* are also evidence of how *the house* responds to combinations of changing *conditions*. In general, the Sub-kind of *vernacular houses* is enormous and the only way to take into account all their architectural features is to have a categorization.



# DISSERTATION ABSTRACT

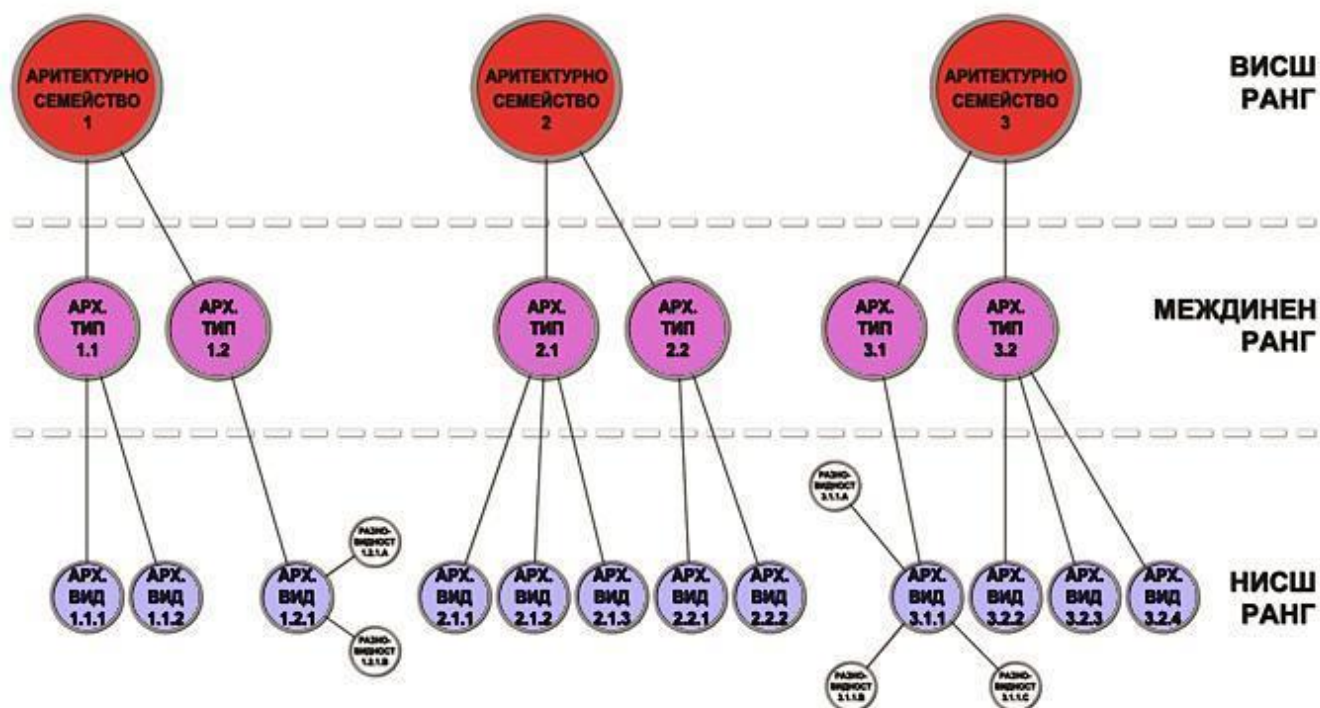


Figure 14. Taxonomy of vernacular houses

# DISSERTATION ABSTRACT

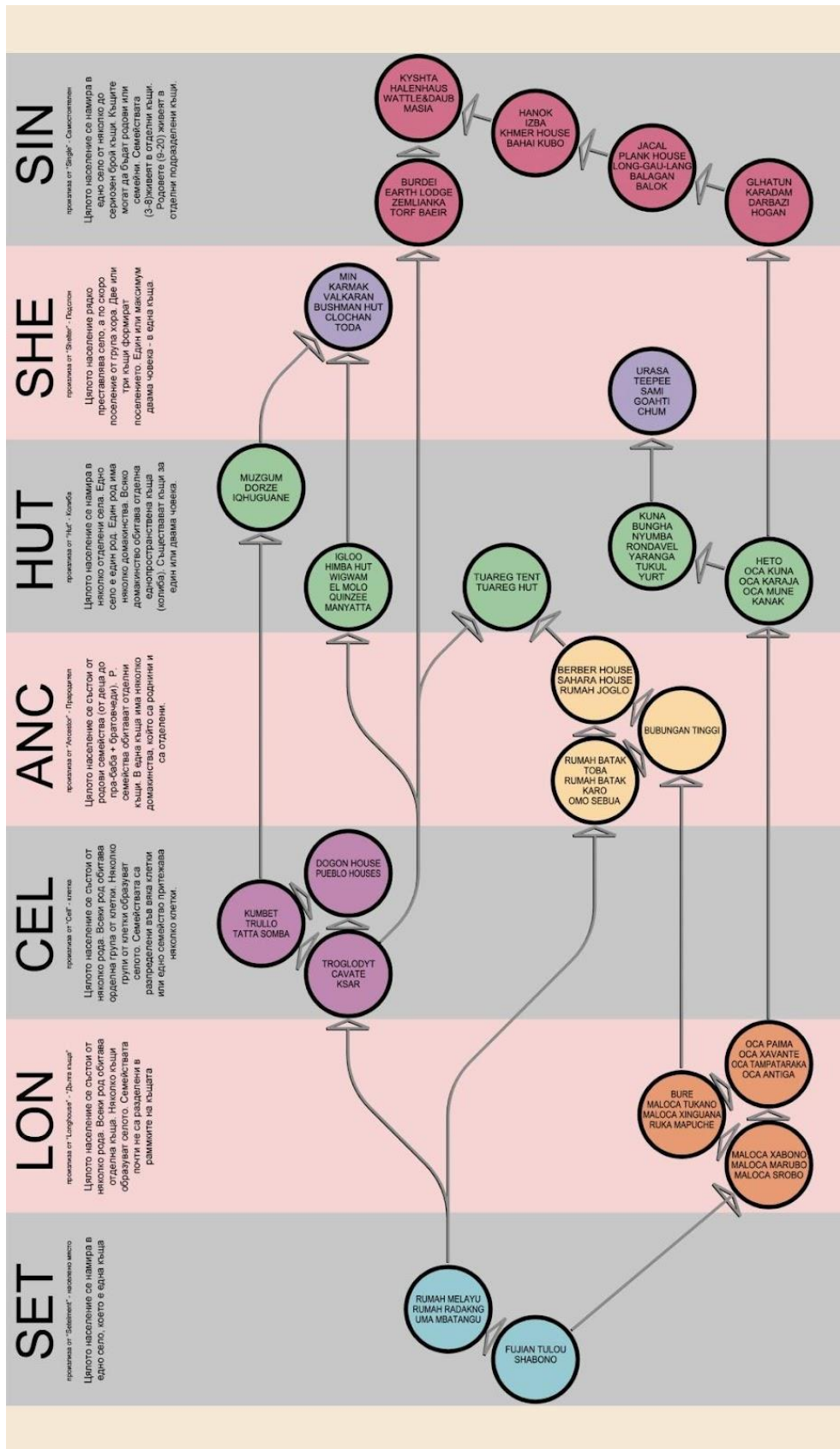


Figure 15. Evolutionary tree of vernacular houses



# DISSERTATION ABSTRACT

As an example, I could again compare with the periodic table of chemical elements, qualities, connections, and matter if we do not know the table in its entirety about properties essence, which will be used for comparison, study, and analysis in general.

## 4. NOMENCLATURE

### 4.1. NAMING

Knowing the "folk" names of vernacular houses, it is clear that they differ significantly even when it comes to the same kind. The naming of two different kinds or types, in the same way, is not observed, but it is probably possible. In order to have unambiguity in the taxonomy (especially being discrete), a system is needed for naming the houses in the next of the features that are functionally convenient for this.

The system was developed as the final result is shown by the example of Figure 16

three letters of the name of the <i>architectural family</i> in Latin	+. +	of the name of the type	+. +	abbreviation	Comprehensible	first in alphabetical order popular name of the kind	+. +	The first three letters of the propertyfeature
"ANCESTORS"	+. +	"VENTILATED ROOF"	+. +	"WOOD"	+. +	BATAK	+. +	TOBA
<b>ANC</b>	.	<b>V-ROOF</b>	.	<b>W.</b>		<b>BAT</b>	.	<b>TOB</b>

Obtain type: **ANC.V-ROOF.W.BATAK.TOBA**

Figure 16. Naming a vernacular house type

After creating this naming system, it was attached to the examples developed in Chapter II.

### 4.2. AREA AND DISTRIBUTION

One of the important features of vernacular houses is the area in which they are distributed. It is not always possible to delineate it, but the approximate location of the house is known even after the study and its recording in a matrix.

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It is also necessary to clarify the terms. The area of one *family* I call *area*, the *area* of one *type* - *zone* and the *area* of one *kind* - *Region*. *Area* is a common name for a specific area.

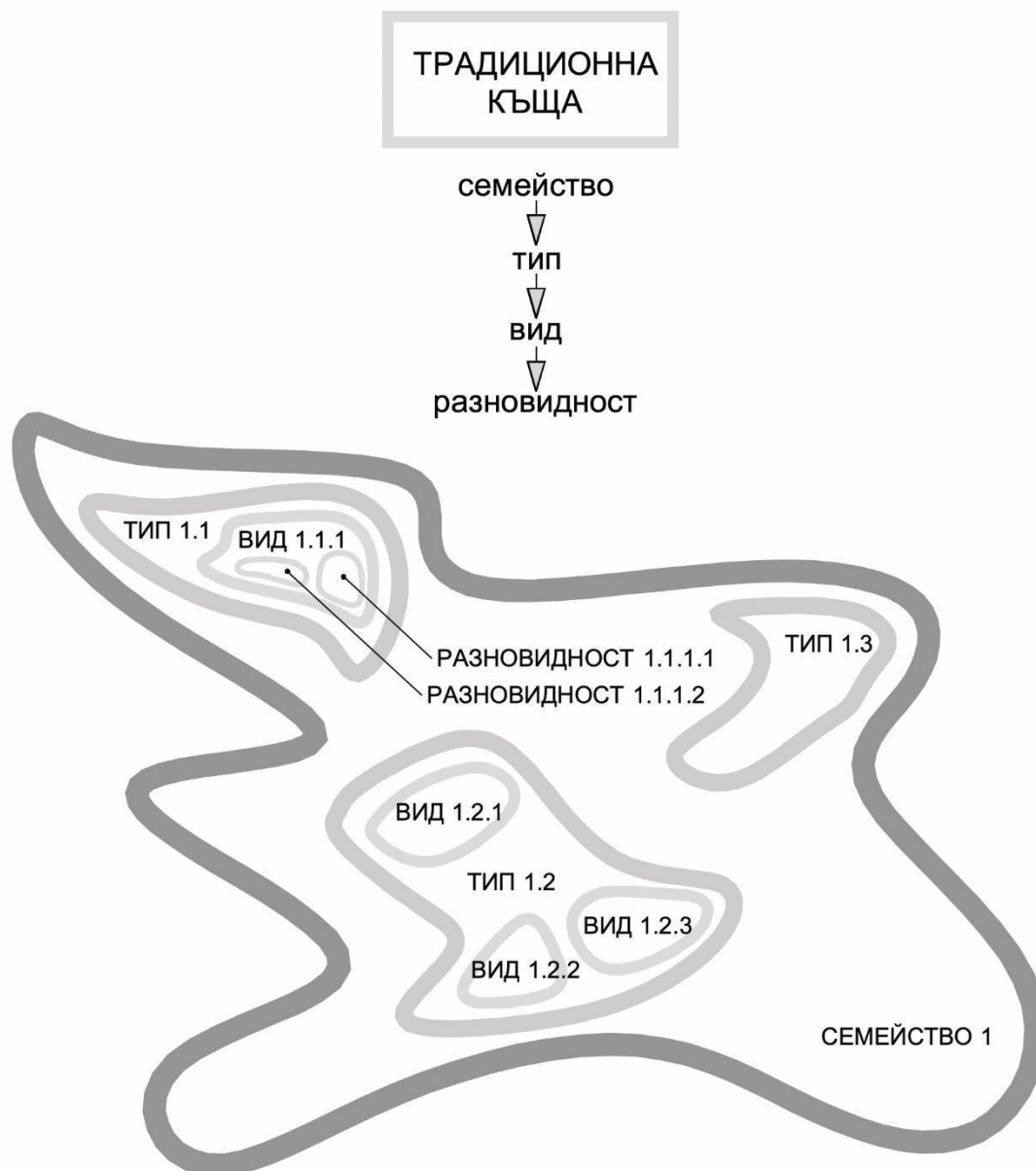


Figure 16 and Figure 17 show how the Area, Zone, and Region depend on the distribution of Family, Type, and Kind and their possible transformations.

Figure 17. District (Family), Zone (Type), Region (Type)

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Distribution of <i>vernacular houses</i> on different <i>territory</i> within one architectural family.	AREA.1 -> HUMAN WEAKLY > PRESERVATION OF PROPERTIES -> boundary of the area (extension in AREA.1 ')
	or
Distribution of <i>vernacular houses</i> on different <i>territory</i> within one <i>architectural family</i> and formation of a new architectural type.	WEAKLY DIFFERENT -> HUMAN ASSUMPTIONS -> CHANGE OF PROPERTIES STRUCTURE -> boundary of the district (DISTRICT 1, new ZONE 2)
Distribution of <i>vernacular houses</i> on different <i>territory</i> and formation of a new architectural family.	AREA.1 -> VERY DIFFERENT HUMAN PREMISES -> CHANGE OF PROPERTIES COMPOSITION -> BORDER OF AREA.1 (new AREA.2)

Figure 18. Distribution of *architectural family* and its possible transformations

## 4.3. SUMMARY OF NOMENCLATURE

The process of synthesis so far includes:

**Development of a naming system in taxonomy -> example of naming -> areas of distribution -> changes in rankings occurring in distribution -> Summary of premises, properties, taxonomy and nomenclature.**

The existence of each system is accompanied by the derivation of terminology, definitions and scope of concepts, as well as their interconnectedness as a whole. This nomenclature is no exception, which in essence is the administration of the taxonomy. With regard to the vernacular house, the strongly related aspects of the nomenclature are naming, distribution and zoning. The naming of the same ranks depends on the Region and may be radically different, due to similar

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premises, but completely different languages of the inhabitants. The spread can lead to different types and kinds in one area or in areas in different parts of the world, parts of one polyregion and of course in specific cases different or identical rank names.

## 5. CONCLUSIONS

### 5.1. TAXONOMY AND NOMENCLATURE Education

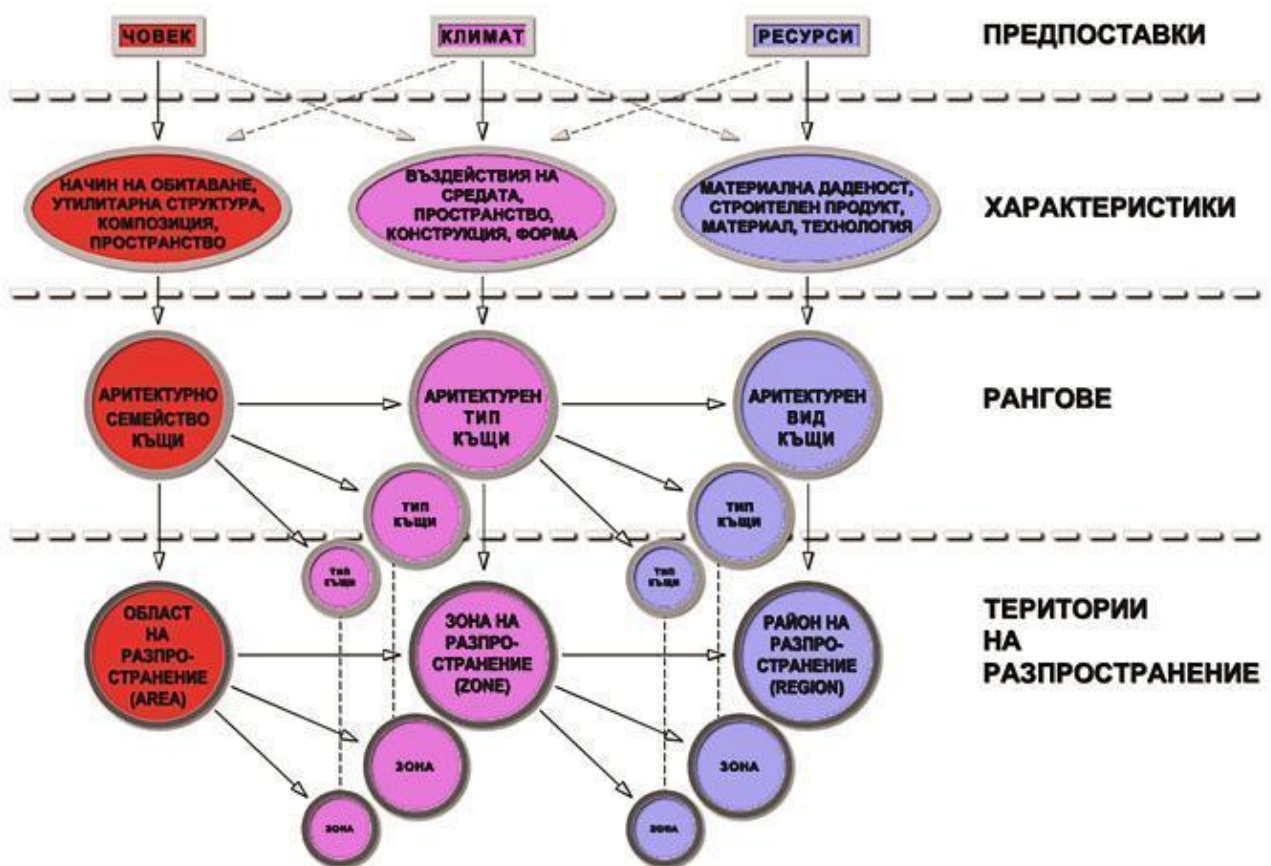


Figure 19. Formation and distribution of the Vernacular House

### 5.2. THE BUILDING AS A SUBJECT / DESIGNER

, *The vernacular house*, as a product of evolution, would have the features of a living organism, and although deprived of its own will, it is a product of evolution. Various theories explain parts of the intangible world or social structures as forms of evolution, so the author has no doubt that such a notion is fruitful. This gives grounds to look at the building as a subject of design. Then the designer

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(architect) or the master using vernacular postulates, the man in general, are only intellectual tools in the evolutionary process.

Such a view is not devoid of logic in the context of modern ideologies for sustainable development. He removes man and his well-being from the selfish center of unsustainable goals and places the evolutionary product of nature there.

## **5.3. SUSTAINABILITY**

There is a continuous thread in work, connecting the content with the modern trends for sustainability, energy efficiency, low-carbon emissions, zero houses, etc. The benefits of labor should be most significant in this direction. A philosophical reflection has been held on the manner and means by which in-depth knowledge of vernacular houses would be applied. There are some perspectives, possibilities and impossibilities, and after analyzing a generalized vision on the topic, it becomes clear that there is a natural path, but not exactly what it is or how it can be done.

The reasoning conducted is based on the conclusions drawn after each paragraph. These conclusions also form the conclusions of the dissertation.

The conclusions focus on the idea that the vernacular house exists as a subject and the person (designer) is an instrument in a process that does not depend on him. Then when the designer has control over the creation of the house, it ceases to be vernacular. Although this judgment sounds like "paragraph 22", it leads to several conclusions:

1. The vernacular house is a source of architectural knowledge, which is the best in the approach we have to perfection in design;
2. The only roots of sustainable development we have are those of vernacular architecture, and inventing a 'different kind' of sustainability would probably not be viable;
3. Sustainable development does not mean literally copying from vernacular sources and features, but rather adopting the approach and a new attitude towards architecture on a much deeper level.

## **6. CONTRIBUTION**

### **6.1. METHODOLOGY**

The main contribution to this paper is the methodology for data collection and classification in a *matrix*. The many benefits of this are: The

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- ability to be systematically analyzed;
- Creating a taxonomy and creating a world map with vernacular houses around the world, their zoning and origin;
- A complex, complete and balanced approach to research;
- The opportunity for in-depth study of their premises, properties, taxonomy, history, and origin to form theoretical concepts and perspectives. The objective connections in the system and the understanding that there are no definite interactions premises - properties - ranks - regions;
- The opportunity for in-depth study of vernacular houses' technical features and properties for the practical application of knowledge.

## **6.2. COLLECTION**

Part of the work is a collection that collects in one place data about vernacular houses, the premises that created them and their properties.

- This information is arranged in a certain way, which makes it valuable because it is available at all and because the data is comparable to each other;
- The end product after this work will be an "Online encyclopedia of vernacular houses around the world." It will allow for their interactive supplementation and updating;
- Recording of information that is transmitted orally.

## **6.3. TAXONOMY AND NAMING SYSTEM**

I consider the contribution:

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- The zoning system and the creation of mapping opportunities for different ranks of vernacular houses;
- Collecting a representative sample of vernacular houses provides an opportunity to create a taxonomy that testifies to vernacular houses' origin, evolution, character, and hierarchy. This taxonomy presents a set of different mechanisms and techniques, demonstrating how vernacular houses react to the environment and are formed according to the premises acting on them;
- These mechanisms and techniques are useful, and should become popular tools in the study and design of buildings in general. Taxonomy and naming give a general idea of the processes and contents of this matter in depth.

## **6.4. THEORETICAL MODEL AND APPROACH IN DESIGN**

The modern approach to the design of buildings is based on tools dressed in theoretical and practical form by professional architects over time. It would be presumptuous and arrogant to say that anyone can offer a better model within a single work.

The contribution here lies in the fact that there is a different philosophical point of view and a different way of analyzing nature, which is a perfect artist in itself. The model proposed in the paper is derived from historical and material reality and represents a paradigm to the design approach without claiming to be infallible and final. The formation of this paradigm in structure crosses the boundaries of other similar endeavors. "Passive house", "zero house", "green architecture", "sustainable architecture," and others remain conceptually only at the level of local concepts.

## **6.5. REGULATORY BASE**

The existence of this work justifies the use of the vernacular house in a certain area as a reliable source of information in creating a regulatory framework for environmentally friendly construction for the same area. Implementing environmentally friendly solutions would mean the availability of raw materials and resources, the right attitude towards the environment and a product acceptable to the community. The only way to use this approach is legislation that reflects the natural balance of some technologically advanced solutions.

The existence of such work makes it possible to search for an architectural approach. "Nothing that nature would not do" with "means of modern



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technology", which will be reflected in the norms and rules of design related to the premises and needs of the place.

## **6.6. CONCLUSIONS**

The work is extensive and exceeds the expected volume of a doctoral dissertation, which is mainly expressed in a complex contribution. All the conclusions after the paragraphs can be interpreted as contributions in a particular context.

## **7. APPENDICES**

For ease of use, a map application has been created, most of which provides clarity on issues related to territories, ethnic dependence, climate, resources, etc. Some of the maps are copyrighted, designed to illustrate the taxonomy.

### **7.1. ATTACHED CARDS**

The dissertation is accompanied by used and author's maps, which facilitates and clarifies the understanding of the matter. It is not analytical but of an ancillary nature.

### **7.2. APPENDIX TERMINOLOGY**

dictionary with used terminology is attached to the dissertation.

## **8. GUIDELINES FOR FUTURE RESEARCH**

- Creation of an "online" system for unambiguous and systematic collection of information about vernacular houses.
- Create complete "online" maps with the areas of distribution and existence of families, types and kinds.

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**Alvin Prana (architecture student)** - Batak, Joglo, Bubungan Tinggi. Data from Indonesia.

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## **LIST OF SCIENTIFIC PUBLICATIONS AND ACTIVITIES ON THE DISSERTATION:**

Radoev K. and Deng W., (2021) **A Method of Creating Vernacular Houses 'Pictograms Based on "Climate - Form" Impact and Relationship: Houses' Pictograms; Part 2**, Submitted to Vernacular Architecture, ISSN: 1741-5888

Radoev K. (2020) **Vernacular Structures 'Environmental Application**, XX International Scientific Conference VSU' 2020, 15 - 17 Oct 2020

Radoev K. and Deng W., (2020) **A Method of Creating Vernacular Houses 'Pictograms Based on "Climate - Form" Impact and Relationship: Houses' Pictograms; Part 1**, UNNC Nottingham e-Print, ISSN: 0264-8725

Radoev K., (2019) **Classification system for integrated research of architectural structures and elements of the building**, XIX International Conference on Construction and Architecture VFU L. Karavelov, Sofia, 17 - 19 Oct 2019

Radoev, K. (2019) **Theoretical Methodology for Classification, Systematization and Research of Architectural Structures**, IX International Scientific Conference ArCive 2019, Varna, Bulgaria.

## **DISSERTATION ACTIVITIES:**

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Guest Speaker, (2019) **Evolution of vernacular houses**, VFU L. Karavelov, April 2019

Guest Speaker, (2019) **Integrated Sketch Task in Lectures**, University of Nottingham, Campus Malaysia

Workshop (2018) **Handmade Constructions on a Vernacular Principle**, University of Nottingham, Campus Malaysia

Guest speaker, (2018) **Handmade constructions with environmentally friendly vernacular materials**, University of Nottingham, Campus Malaysia

Guest Lecturer, (2015) **A Method for Studying the Structures and Technologies of Vernacular Houses**, University of Girona, Catalonia, Spain