

Navigation of the Holy Quran to Explore the Islamic Chromatic Patterns

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Abstract Formulation of a color identity to the built environment has to take into consideration group of constrains such as the broad meaning of environment, its traditions, special value, and other creative aspects. The spread of urban development within the age of globalization has caused the transition of specific colors between different places worldwide to paint buildings with similar colors though culture, civilization and environmental differences between these places. Moreover, the obvious chaotic and random use of colors in Cairo and several Arab and Islamic cities and capitals, requires solutions for such problem to help rebuilding the identity and associate sense of belonging to the community and the surrounding environment. This paper's aim is to propose a solution to this problematic issue through setting a systematic methodology to deduce and derive group of color patterns that has been mentioned in the Holy Quran. An analytical and deductive approach are used to serve the different parts of the research, in order to reach a color map that could be an aiding tool in reinforcing the identity, revitalizing, and distinguishing the urban fabric in the Islamic cities and capitals.

Keywords Color Identity, Colors in Islamic Urbanism, Colors in the Holy Quran, Urban/Architecture in Islamic Cities

1. Introduction

Color is defined as the impression that light generates on the eye. The choice of color, its rejection or acceptance is taken place because of physiological, psychological, social, religious, symbolic and gustatory preferences. Each color has its psychological meaning as a result of its physiological effect on humans. Colors are joyful, relaxing, irritant, sad, distracting, worrying, painful, and disappointing. Thus, social factors such as norms, customs and traditions have its effect in the choice and preference of colors.



Figure 1. The use of colors in ancient ages architecture

Since the ancient civilizations especially the Pharos civilization, colors had been used in the internal spaces such as walls and ceilings. The ancient artist used materials from soil besides other vegetarian and animal materials in producing colored powder and pigments, so colors looked natural and non artificial or intrusive on the architecture. The color treatments appeared in the Greek and Roman architecture due to the use of granite, marble, while in the Gothic architecture the stained glass had an essential effect, "Figure1".



Figure 2. Colors in local architecture – Nubba, and African villages

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The function of any color differs by the influences of civilizations and human groups. Graham Collier proposes an example to indicate the frame of symbolic function of the color in Byzantine religious drawings during the middle ages,

however, he argues that the color blue, which covers most of Virgin Mary's robe, symbolizes purity and clearness, while the red color implies to human passion and secular preoccupation, and green represents fertility and mother-hood, while gold is used as a background for pictures representing what is sacred. Moreover, colors were used in vernacular architecture through the world as villages in Middle and South Africa, and villages in Nubba, which consider coloring an important ritual of the construction process, "Figure2".

After the World War II, a lot of artistic trends appeared to evoke the use of colors in construction as architects astonished the common architecture in this era and described it by boredom and depression. Thus, different color movements appeared such as the parrot architecture or peacock architecture in which architects used the four colors: red, yellow, green, and blue to emphasize the architectural form or enhance space repetition and indicate the importance of color use in the work of architecture, "Figure3".



Figure 3. Colors used in post second world war architecture (Peacock architecture)

There is no doubt that the use of color in the urban environment will give it an added value as color is the aesthetic element that completes the urban and architectural creativity. Moreover, colors have psychological effects to be usefully used in enhancing sense of belonging to the place, as well as increase human's interaction with the surrounding environment[3]. Yet, the use of colors in architecture could be comfortable and beautiful and might be annoying, disturbing and causes disorder. The use of colors in the architecture of Cairo and several Arab and Islamic architecture nowadays is an example of that, where architecture sometimes turned to be the host of an open color festival that has a negative effect and may even lead to determinate the building's aesthetic value, "Figure4".



Figure 4. The random use of color in Egypt, Arab and Islamic countries

Thus, formulating a color identity of the built environment has to take into consideration group of constraints such as the

broad meaning of environment, its traditions, special value, and other creative aspects. Yet the spread of urban development within the age of globalization has caused the transition of specific colors between different places worldwide to paint architecture with similar colors though culture, civilization and environmental differences between these places. Thus, it is essential to study of the color identity of the space as it has a strong connection with the cultural identity that differentiates the built environment and enhances its identity to create a cohesive community.

Colors definitely play an important role in the visual image of urban and architecture. As materials are impossible to be found without colors, and because of the chaotic use of colors in Cairo and several Arab and Islamic cities, it is, therefore, essential to investigate and find a solution to this problem. The architect has to organize and employ the use colors in the urban and architectural environment to provide a homogenous environment that enhance rebuilding identity, sense of belonging to the community and surrounding environment, as they are important aspects of sustainable architecture.

2. Colors in Holy Quran

Colors in the Holy Quran is considered to be a unique phenomenon of art expression, aesthetic, and verbal expression which characterizes the Quran miraculous method. In addition to the symbolic meaning of color in Quran as an indication of the divine power, mercy, divine beauty which appears in God's various creatures, it is, as well, can be a symbol of life and death, hope and disappointment, belief and disbelief, vitality and grief, and other connotations[20]. The word (colors) and its derivatives has been mentioned in seven Holy Quran verses (interpreters see that this is an indication from God to the known seven chrome colors that formulates the white bright color), and the word (color) has been mentioned twice in one verse of the Holy Quran. These words were mentioned in the following positions:

2.1. Word Color

They said: Call on your Lord for our sake to make it plain to us what her color is. Musa said: He says, Surely she is a yellow cow; her color is intensely yellow, giving delight to the beholders"! (*Al-Baqara* 69)

2.2. Word Colors

"And the things on this earth which He has multiplied in varying colors (and qualities): verily in this a Sign for men who celebrate the praises of Allah (in gratitude)", (*An-Nahl* 13), "Then eat of all the fruits and walk in the ways of your lord submissively. There comes forth from within it a beverage of many colors, in which there is healing for men; most surely there is a sign in this for a people who reflect, (*An-Nahl* 69). "And among His Signs is the creation of the

heavens and the earth, and the variations in your languages and your colors; verily in that are Signs for those who know", (*Ar-Room* 22). "With it We then bring out produce of various colors", (*Fatir* 27). "And so amongst men and crawling creatures and cattle, are they of various colors", (*Fatir* 28). "Seest thou not that Allah sends down rain from the sky, and leads it through springs in the earth? Then He causes to grow, therewith, produce of various colors: then it withers; thou wilt see it grow yellow; then He makes it dry up and crumble away. Truly, in this, is a Message of remembrance to men of understanding", (*Az-Zumar* 21). Those words were mentioned in Holy Quran to accomplish several functions, where of its main functions are the following [18]:

2.2.1. The Expressive Function

It appears in the direct quotations, which holds various meanings such as joy, happiness, pleasure, grief, terror, and dread.

2.2.2. The Symbolic Function

It appears in the indirect or inspiring quotation, which calls for meditation, thinking, and reflection, as recited: "He who has made for you the fire (to burn) from the green tree, so that with it you kindle (fire)", here, the green color first symbolizes fertility, and continuity of life and then refers to the fuel for combustion and death.

2.2.3. The Sensual Function

It depends on the effect of shapes and visuals seen in most of God's creatures on human eyes, as it is considered a mean of connection with the universe and creatures. It is an invitation for thinking and reflection, because a number of these color words were followed by the phrase "Haven't you seen that Allah..." which is a direct call to look through eyes, and think mentally, and recognize with our heart, to study these mentioned phenomenon in the Holy Quran verses.

2.2.4. The Aesthetical Function

The words (aesthetic and beautiful) are mentioned in eight Holy Quran verses, that talks about creation, moral, and sensual beauty and some of these verses were connected to colors, as recited by God: "As if they were (delicate) eggs closely guarded", (*As-Saaffat* 49) to indicate the beauty of paradise women described with the best women colors. The color's aesthetical function, has worked on clarifying the picture and emphasizing the idea, indulging the meaning, and affecting the person by temptation and intimidation, which awakens the heart, and is considered a source of inspiration. Modern science has defined that the primary colors of light as: **red, green, and blue**, while the primary colors of paint or pigments are: **red, blue, and yellow**. All these four colors have been mentioned in the Holy Quran (red, yellow, green, blue) considering that Allah hasn't missed anything in the Holy book [13]. Additionally, we find as well in the Holy Quran the black and white colors, because they have a special situation among colors though they are

not main. Thus, it can be said that all colors have been mentioned in Holy Quran, and they are recited as following:

(1) White

The White color is special in its nature, function, symbolism and indication rather than other colors. However, there are various connections of this color and human behaviour. In its reality, the White color contains all the colors, thus it reflects them and the word "the white" has been mentioned once in Holy Quran in (*Al Bakara*) verses in God's recitation: "And eat and drink until the white thread of dawn appear to you distinct from its black thread"; (*Al-Baqara* 187). The prophet's (peace be upon him) explanation about the word white is the whiteness of the day in its beginning just before sunrise [14].

Nasa space agency's cameras has recorded a picture for the area where day and night integrate, and found that it is a delicate layer with thickness no more than (1 by 100) of the earth diameter surrounded by night darkness from all sides. They installed several pictures of the Earth, and edited them with the computers. The west coast for both the european and african continents are appeared in this processed picture and there was an obvious line separating night from day, with a clear black line in the night area, and a clear white line in the day area and a very tight area in between which is the dawn area, "Figure 5".

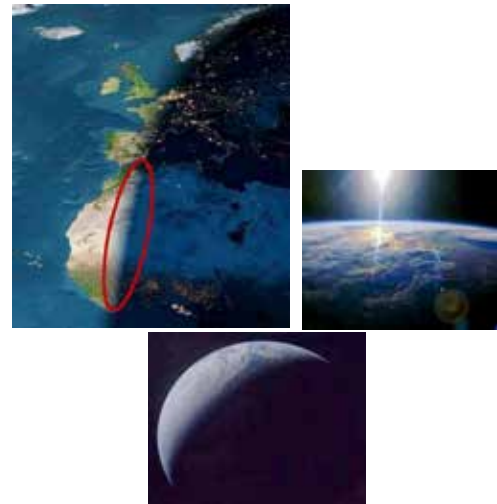


Figure 5. The area of day and night _ photographed by NASA agency

Moreover, the word (White) was mentioned in (*As-Saaffat*) verses where God described women of paradise with the best women's body colors and that's in god's recitation: "As if they were (delicate) eggs closely guarded" (*As-Saaffat* 49). In the explanation of the White color in this verse, it was mentioned that it is the yellowish white and it's the best women body color [14]. Also the word white has been mentioned in (*Fatir*) verses in God's recitation: "... And in the mountains are tracts white and red, of various shades of color, and black intense in hue", (*Fatir* 27). The tracts refer to the horizontal layers the formulates several range of mountains called sedimentary. Most of them are white which is the limestone (and its widely available, thus mentioned first) and in various cases, it integrates with layers of red iron

ore like that in Colorado city- US and El-Perta city- Jordan, "Figure6".



Figure 6. The layers of white and red colors appears in the mountains chain of Colorado- US and El-Petra- Jordan

The word "White" was mentioned in six positions, God recited that: "And he drew forth his hand, and lo! It was white to the beholders"(Al-Araf108) (*Ash-Shuara*33), and in other Holy Quran verses such as: "And enter your hand into the opening of your bosom; it shall come forth white without evil..."(*An-Naml* 12), "Now draw thy hand close to thy side: it shall come forth white (and shining), without harm (or stain), - as another Sign," (*Taha* 22), "Move thy hand into thy bosom, and it will come forth white without stain (or harm)..." (*Al-Qasas* 32),

And in the sixth topic, God described the paradise wine, in (Safat) vesres, as running white wine with a bright color, where God recited: "Crystal-white, of a taste delicious to those who drink (thereof)", (*As-Saaffat* 46). The interpretation of this verse refers to this wine as the purest wine in the world, where all disadvantages and defects of the world's wine are not exist. The word (Whitened) has been mentioned first in Holy quran in (Aal-e-Imran) verses in God's recitation: "But those, whose faces will be (lit with) white, they will be in (the Light of) Allah's mercy; therein to dwell (forever)", (*Aal-e-Imran* 107), and the second was in *Yusuf* verses of Holy Quran in God's recitation: "And he turned away from them, and said: "How great is my grief for Yusuf!" and his eyes became white with sorrow, and he fell into silent melancholy", (*Yusuf* 84), to indicate that white color is the contrast of black color. Also, the word whiten has been mentioned once in (Aal-e-Imran) verses assuring the clarity, purity, and righteousness as God recited: "On the Day when some faces will be (lit up with) white, and some faces will be (in the gloom of) black", (*Aal-e-Imran* 106), it's the day of resurrection when the faces of those who have faith are white, and those who don't have faith will have black faces[17].

(2) Black

Blackness in physics means losing the color, where everything that doesn't send waves to the eye is seen black. The word (black) and its derivatives has been mentioned seven times in Holy quran verses, twice was to express the

hue of the black color, as following: "And eat and drink until the white thread of dawn appear to you distinct from its black thread", (*Al-Baqara* 187). This verse is refereing to the blackness or darkness of light, while for material blackness, the verses says: "And in the mountains are tracts white and red, of various shades of color, and black intense in hue", (*Fatir* 27).

Those mentioned mountains with clear mountain top consisting of igneous rocks, like that consisted of "El Gabro" rocks, yet volcanic mountains that consists of Basalt rocks known with its extreme black color, and what is meant with this verses is that mountains consists of layers of colors (from white to red), and others consists of one color with no layering (no color gradients) which is black. These black mountains were actually found in various places in the world such as in Canada, Hawaii islands and El-Perta city- Jordan, "Figure7".



Figure 7. The layers of white ,black and red colors appears in the series mountains of Canada, Hawaii islands and El-Petra-Jordan

The derivatives of the word (black color) are mentioned five times to express the situation of the infidels and the hypocrites whom faces are blackened, and this is a metaphoric expression where the word black has been mentioned to show the intense grief, and how dark it is[15]. The verses were recited as follows:

"On the Day when some faces will be (lit up with) white, and some faces will be (in the gloom of) black: to those whose faces will be black, (will be said): "Did ye reject Faith after accepting it? Taste then the Penalty for rejecting Faith"; (*Aal-e-Imran* 106,107),"And on the day of resurrection you shall see those who lied against Allah; their faces shall be blackened. Is there not in hell an abode for the proud? (*Az-Zumar* 60),"When news is brought to one of them, of (the birth of) a female (child), his face darkens, and he is filled with inward grief"! (*An-Nahl* 58),"When news is brought to one of them of (the birth of) what he sets up as a likeness to (Allah) Most Gracious, his face darkens, and he is filled with inward grief"! (*Az-Zukhruf* 17). A derivative of the word (black) was mentioned once to express the condition of the pasture which are crops and plants after drying off and corruption, so God recited: "And Who brings forth herbage. Then makes it dried up, dust-colored", (*Al-Ala* 4, 5). Thus, the Holy Quran verses shows how the (white) is the extreme serenity, clarity, pureness, purity, and acceptance from God, and that (black) is extreme darkness and gloominess. Both (white) and (black) are followed in one verses to explain the

extreme contrast between the two colors which enhances the meaning of the two contradictions.

(3) Yellow

The color yellow is the most joyful color as it represents brightness and illumination, and is considered the most bright and lightening color, because it is the sun color, the source of light, heat, life, and activity. Yellow color has been mentioned once in *Al-Bakara* verses to explain the color of the holy cow, as God recites: "He says: a fawn-colored heifer, pure and rich in tone, the admiration of beholders"! (*Al-Baqara* 69). This color has been indicated as being one of the most precious and beautiful colors, where God described the bright yellow cow's colors as a source of attraction and appealing for the viewers, "Figure 8".



Figure 8. The yellow color in various God's creatures

A lot of references, as well as interpretations of the Holy Quran indicated the recitation of God "pure and rich in tone" which means the color is so pure because its so bright. (El Kotobee) has mentioned by the name of (Ebn Abbas) pure and rich in tone" which means that when yellow is so bright it tends to appear white and indulge the viewers indicating its beauty, elegance and vitality. (El Kesaa'e) says: "if its color decrepitate its yellow color vanishes".

The derivatives of the word (yellow) are mentioned in three positions in the Holy Quran including examples God shows for life in the world when rain falls from the sky, planting fruits and seeds, then dries and becomes yellow in color, to be crash afterwards [12]. In the first position in (*Ar-Room*) verses where God recites: "And if We (but) send a Wind from which they see (their tilth) turn yellow, behold, they become, thereafter, ungrateful (Unbelievers)"! (*Ar-Room* 51). In this verses God explains the effect of wind when it comes without rain, where it makes the crop be yellow in color. The crops' colors changing from green to yellow indicates that it is just wind with no rain. It is noticed that yellow color in this case indicates loss, where it announces being close to loss, life, and vitality ending, trash and nothingness, "Figure 9".



Figure 9. Plants changing its natural color from green to yellow

In the other two positions God states that the world is fertile green with all joys it holds then it turns old, and the youth becomes an old weak man, as well as the green color of crops and plants turns dry, so it is seen yellow, "In this, is a Message of remembrance to men of understanding", Which means that those who remember this ought to be wised of it. This meaning was recited in the following Holy Quran

verses: "See thou not that Allah sends down rain from the sky, and leads it through springs in the earth? Then He causes to grow, therewith, produce of various colors: then it withers; thou wilt see it grow yellow; then He makes it dry up and crumble away. Truly, in this, is a Message of remembrance to men of understanding", (*Az-Zumar* 21). "Thou wilt see it grow yellow; then it becomes dry and crumbles away", (*Al-Hadid* 20).

The word "yellow" came in only one position in the holy Quran, yet to indicate the black color mixed with yellow, where God described this color as that flame glowing out of hell. This is mentioned in the following Holy Quran verses: "As if there were (a string of) yellow camels (marching swiftly)", (*Al-Mursalat* 33). In the interpretation of "yellow camels" most explanations state that the beauty of yellow is in its look, quantity, and continuation. This shows that the color indications are such as linguistic indications in terms of refereing and relating to the culture. It is however clear that the yellow color in the Holy Quran related to loss and sickness when it is a result of green changing into yellow, or when its related to black color. On the contrary when the yellow color is bright integrated with white it gives a feeling of joy and self comfort [17]. Since the yellow color is a basic color in paint and not in light, as mentioned earlier thus, the Holy Quran verses that mentioned yellow color were all considering the yellow colored materials and not in light which is an indication to this scientific fact [13].

(4) Green

This color is a symbol of goodness and faith in the islamic thoughts, and it is the most popular color in the islamic culture, litterature, and art. It is always appeared in mosque's domes, curtains of God's home (*Al-Kaaba*), turbans (covers of head) of religious men, and with no doubt the material that is produced of the chlorophile which is one of life's origion on Earth. Recently, expiriments have been held to use color in treating some illness, where the patient gets to wear a robe with a certain color or be seated in a room with its walls and furniture of a specific color, and focus his sight for some time and concentrate his mind and contemplates the pain location he suffers from, these experiments have discovered that green color specifically determinates the spread of germs, bacteria, and helps release pain, resists fatigue and feeling tired, so it makes patient feel happy and heel from bacterial diseases.

Thus, they knew the secret of the use of green color by the Pharos in their graves, to protect their mummies from the bacteria. In the Holy Quran, God made the green color as the distinguishing color of people in heaven and their furniture to point out the importance of imitating their clothes and furniture in our life aiming at feeling some of their happiness. The color green took most of the attention in the Holy Quran more than other colors, it has been mentioned once to indicate liveable creatures, as God recited: "He who has made for you the fire (to burn) from the green tree, so that with it you kindle (fire)", (*Ya Seen* 80).

God indicated his entire ability in bringing life to the death, and his ability to change the existing condition like getting

dry and burn of the moist and life, from it you are flamed to have life again. The word (green) is mentioned in three positions which are: "...And seven green ears of corn and (seven) others withered", (*Yusuf* 43, 46). The word "green" here indicates the color of special, and this confirms that green color means life with all it hold of relaxation and stability, and fertility[18]. The third location where the word green is mentioned is in God's recitation: "Reclining on green Cushions and rich Carpets of beauty", (*Al-Rahman* 76).

The interpreters see in God's recitation "Green Cushions" that describing couches as green refers to the meanings of stability and serenity. It is striking that God didn't describe these cushions as comfortable, wide, or other descriptive expressions, but God shortened all these meaning in one word which is "green", and this indicates the value of green color and its role in the positive psychological impact on the people and human feel of joy, happiness, and enjoyment. In (*Al-Insan* 21), God recited: "Upon them will be green Garments of fine silk and heavy brocade", Here the word "green" was used to describe heaven and its components of furniture, clothes and accessories.

The word "green" also came in God's recitation: "And they will wear green garments of fine silk and heavy brocade; they will recline therein on raised thrones. How good the recompense! How beautiful a couch to recline on!" (*Al-Kahf* 31). In this verse God has described the accessories and silk cloths of people in heaven with unique description and there were no better color than the green color to describe it with. Thus the green color is considered a distinguishing color for paradise, to indicate bliss, and life after death[17]. One of the synonymous of the word "green" is used in one position in Holy Quran. God recited: "With it We produce vegetation of all kinds: from some We produce green (crops), out of which We produce grain, heaped up (at harvest)"; (*Al-Anaam* 99).

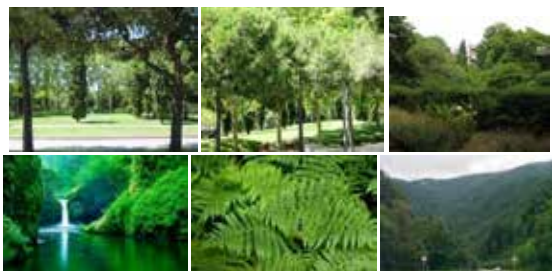


Figure 10. Some forests in Spain And Germany it shows the green color gradients that seems black in color

Some interpretations mentioned that the word "green" was used to describe some crops such as wheat, barley, maize, rice and other grains. Another synonym of the word "green" came in one position and it indicated God's entire ability to bring life after death, and God recites: "See thou not that Allah sends down rain from the sky, and forthwith the earth becomes clothed with green? For Allah is He Who understands the finest mysteries, and is well- acquainted (with them)", (*Al-Hajj* 63). The word "Both inclining to blackness" in God's recitation: "Both inclining to blackness", (*Al-Rah*

man 64), is a synonym of dark green as mentioned by (Al-Tabary) who said that "both inclining to blackness" means "They tend to appear black as they are extremely green" in his description of dark green grading to black, and these tones of green color was found on earth in some forests intense with trees like in Spain forests and the black forests in Germany, "Figure 10".

(5) Red

Is a main color in light and in paint, as well as blue color. This indicates a characteristic of stability in the red color[13]. The (Red) color has some indication like red gradients found in mountains, and red color existing in fruits and plants. The word "red" was mentioned in one location in the Holy Quran to explain the hue of the color and its properties, and refers to that differences in colors originally come from white and red. God recited in his holy Quran: "..... And in the mountains are tracts white and red, of various shades of color, and black intense in hue", (*Fatir* 27).

It is obvious from this verse that the aesthetic sights of mountains that Quran emphasizes comes from the beauty of colors and color gradients in those mountains, as God described in this verse the mountains as tracts and lines of white and red with its different color gradients[18]. God didn't mention any other color than "red" and the Holy Quran mentions the phrase "various shades of color" after god's recitation "red" indicating that it's the origin of colors, mentioned after white that is the source of all other colors, "Figure 11".



Figure 11. Elements and universal creatures with the colors mentioned in Holy Quran

This Holy verse showed a short and accurate glimpse identifying the change of color in nature. However, it shows colors in nature are originally a derivative of white color, then it grades from red to black[17]. The field and practical experiments have proved that natural colors are formulated through the integratin and combination of basic red paints, which means that all red colors are integrated in the primary component because of the disolvation of iron items in nature. This verse in the Holy Quran: "...And in the mountains are tracts white and red, of various shades of color, and black intense in hue" shows that God didn't choose a color rather than red as he knows the reason of color origin, either natural or light colors.

The red color has been mentioned twice in the Holy Quran, once in this verse where red color was mentioned directly indicating the integration of ultra red rays and red color rays to produce all other colors. The other time to mention the red color, was taken place to indicate a specific gradient of red which is a word mentioned in the following recitation of God:

"And when the heaven is rent asunder, and then becomes red like red hide", (*Al-Rahman* 37). The meaning in this verse is that the sky turns red like that of roses, where it melts until it becomes red like the color of fire with all meaning of power, excitement, and extreme hot feeling it holds[15], "Figure 12".



Figure 12. Red colors and the color tone it indicates –Barcelona/ Spain

(6) Blue

The color blue is one of the main colors in paint and light, and it shares this same characteristic with the red color. The word "blue" was mentioned in the Holy Quran in only one position and it referred to sadness and concern, in God's recitation: "...And We shall gather the sinful, bluer-eyed (with terror), on that day", (*Taha* 102).

It is known that the color of blood is red and when it turns to blue it means extreme suction of oxygen and that blood is corrupted, which is the perfect expression of condense. The word "blue" indicates all meaning of severe depression, sadness, and feeling of death. Thus the blue color was used in the verses of Holy Quran to indicate fear and loneliness when it is mentioned with black[18].

On the contrary, baby blue which is known in rainbow colors as Nile blue was the only blue gradient color that appears on the surface of Earth in seas, niles and oceans, and it has positive impacts on feeling relax and minimize tenses. Nations' interpretation for blue color differs a lot as for Jewish, it means sanctuarity, while for most of Islamic and eastern countries it is not preferable and is used to prevent envy and damage.

3. Applications for the Use of Colors in Islamic Cities and Capitals

Urban and architecture is like a painting that its aesthetical elements never be completed without the use of color. Lot of beautiful designed buildings may lost its beauty because of misuse of colors. Colors are element of attraction, where people with various cultures meet and share in feeling the aesthetical value of color and in differentiating between ugly and beautiful colors. Muslims have excelled in initiating their special architectural trend characterized by its unique colors concentrating on those colors mentioned in the Holy Quran. It appeared in direct application in Islamic urban and architectural environment.

It has been noticed that the use of color in Arab and Islamic cities has taken different patterns, where it appeared in some cities as the monochromatic architecture (such as: Sedi Bo-Saied/Tunisia, Dara/Morocco, Jerusalem/Palestine, Amman/Jordan, Muscat/Oman ...etc.). This unity in color, in addition to the presence of greenery and trees that makes it seem as an artistic paint, might give the city an aesthetic

identity, where colors were used on several levels (cities, squares, streets, public buildings and symbols, details and miniatures of Islamic buildings), "Figures 13, 14, 15, 16".



Figure 13. On the level of Islamic cities, Towns and governorates



Figure 14. On the level of Squares and public streets in some Islamic spots



Figure 15. On the level of the public, symbolic, monumental, and sacred buildings

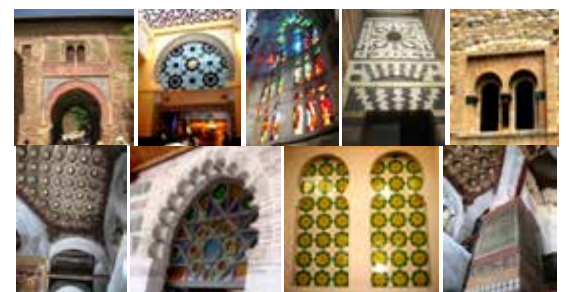


Figure 16. On the level of the details and ornaments of the buildings

The use of colors in the Islamic culture is not limited to urban and architecture places, but it appears as well in graphics, poster design and other fields. Most of applications of colors in Islamic cultures have focused on the use of green color, which is an important color in the Islamic culture. It is seen in the flag of Saudi Arabia, the logo of League of Arab states, the official website for the prophet Muhammed (peace be upon him), which is recently established on the web, and as well in the suggested design for Medina's logo, "Figure 17".



Figure 17. The use of green color basically in cities logo, flags of the countries, symbols for major institutions, vital Islamic websites

It is noticed from those practices that the use of the Holy Quran colors: red, blue, yellow, and green besides black and white, is taken place in the iconic buildings that has special value in the Islamic cities and capitals. Those colors are used in different degrees that vary from one city to the other due to the culture and community differences and the colors of the surrounding environment. Generally, Islam has pruned the taste of Bedouin life to be loving of nature and colors, and it was reflected in the Islamic urban landscape with the intense use of light colors. For example, the blue color, though it has been mentioned in the Holy Quran as the blue of death, yet the Islamic architect used the Nile blue tone because it's the color of sky, and water which are the essence of life "we've created everything alive from water". Thus the Islamic architect paid attention to this color as it is integrated with the soul of Islam and because this color is matching with the cool effect desired for the people of such hot climatic environment.

4. Formulation of a Chromatic Map for the Islamic Built Environment

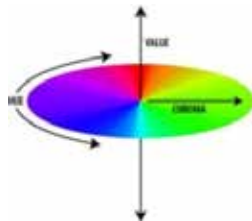


Figure 18. The basic idea of Munsell model

There are several models of color systems; one of the most influential color-modeling systems was devised by Albert Henry Munsell, an American artist. Munsell desired to create a "rational way to describe color" that would use clear decimal notation instead of a lot of color names that he considered "foolish" and "misleading." His system, which he

began in 1898 with the creation of his color sphere, or tree, saw its full expression with his publication, *A Color Notation*, in 1905[2], "Figure 18".

This model done by Munsell is the method of measuring, describing, and expressing the color, and it's the most popular and applicable model as it is connected with the method that the eye realizes the primary colors of light (red, green, and blue) or (RGB), and other colors in nature are derived through these colors[19]. Yet it is considered a base for the color systems used in television, and several computer programs such as Photoshop and others. This system describes the color by knowing the three basic characteristics: hue, value, and Chroma [4], "Figures 19-20".

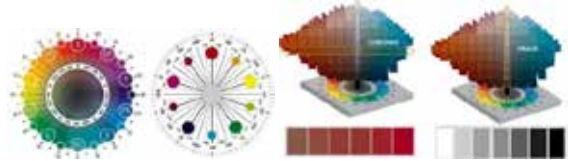


Figure 19. Color characteristics (The intensity, the value and the porch)



Figure 20. 3D visualization of Munsell model

– **Hue:** Is that attribute of a color by which we distinguish red from green, blue from yellow ...etc.

– **Value:** Indicates the lightness of a color. The scale of value ranges from 0 for pure black to 10 for pure white. Black, white and the gray (as shown in figure 2) between them are called "neutral colors". They have no hue. Colors that have a hue are called "chromatic colors." The value scale applies to chromatic as well as neutral colors.

– **Chroma:** Is the quality that distinguishes the difference from a pure hue to a gray shade. Chroma is not uniform for every hue at every value. Munsell saw that full Chroma for individual hues might be achieved at very different places in the color sphere.

Various studies were done built upon Munsell model to take advantage of to study and understand the relation between colors and its various classifications in order to reach the color combinations that give psychological impressions and expressions[6].

In this section, the paper provides an analytical and deductive approach to formulate a chromatic map (based on the Holy Quran verses) that could be an aiding tool in reinforcing the identity, revitalizing, and distinguishing the urban fabric in the Islamic cities and capitals. The phases of the suggested approach are:

1. Choosing of elements and creatures where the color is obvious as mentioned in the Holy Quran description.

2. Analysing pictures for these elements and creatures through several computer programs (Color Analysis Software) in order to reach the chromatic combination

(RGB) for them. This paper used the following programs for this manner: Color Palette Generator, Color Explorer, Color Calculator, and Color Munki.

3. Compare the colors concluded with the chromatic maps done by Munsell,"Figure 21". And those existing in what's known as Munsell Atlas Software to reach specific color gradients in a scientific accurate method.



Figure 21. the Congruency of the color on Munsell system

4. Identifying the chromatic color maps interpreted from the Holy Quran.

However, in the first three phases, different professional photos are selected for some elements and natural phenomenon that represent one of the colors interpreted in the Holy Quran. An analysis of such photos is done through different color analysis software that previously mentioned in order to reach its specific colors and compare those colors

to Munsell system program, as an attempt to reach a color code (RGB) for those colors, which has scientific bases, "Table 1".


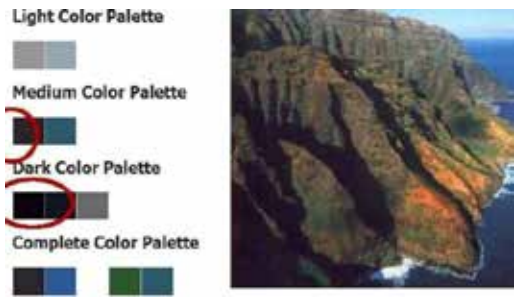
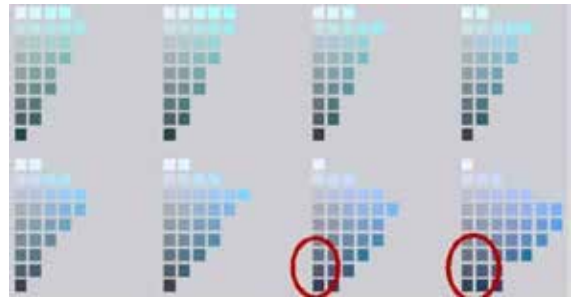
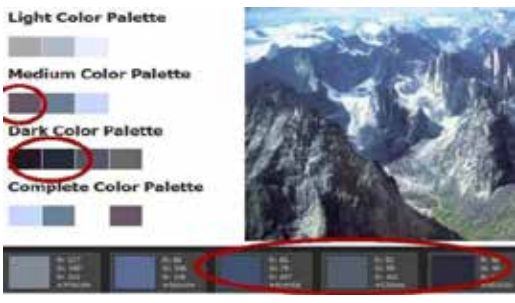
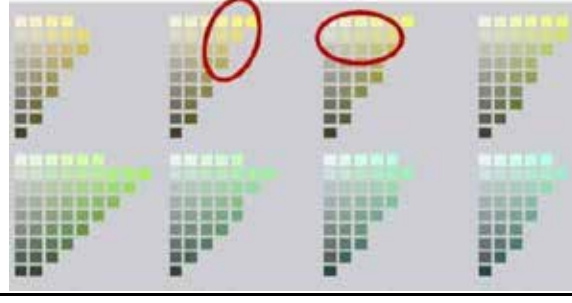

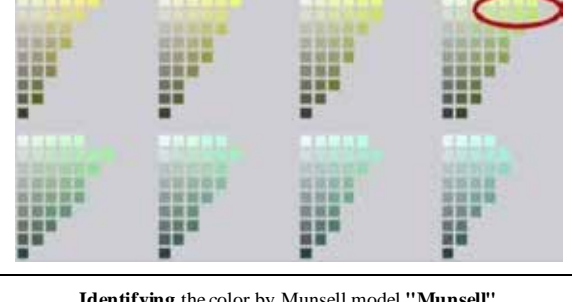
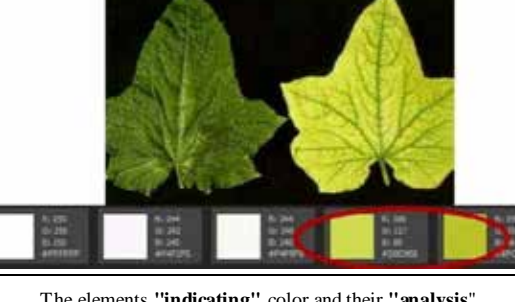


The Forth phase in the suggested approach is concerning with determination of a chromatic color map. The color pallets which are determined from table (1) is defined with its color code (RGB) and represented in Table (2) with additional suggestions of different values and chroma in order to give the freedom and flexibility in making these color dark or light to match the givens, climate and the surrounding environment. Whenever the values of the (RGB) for each color is low then the color sought is dark, and the opposite whenever the values are high the color is lighter.

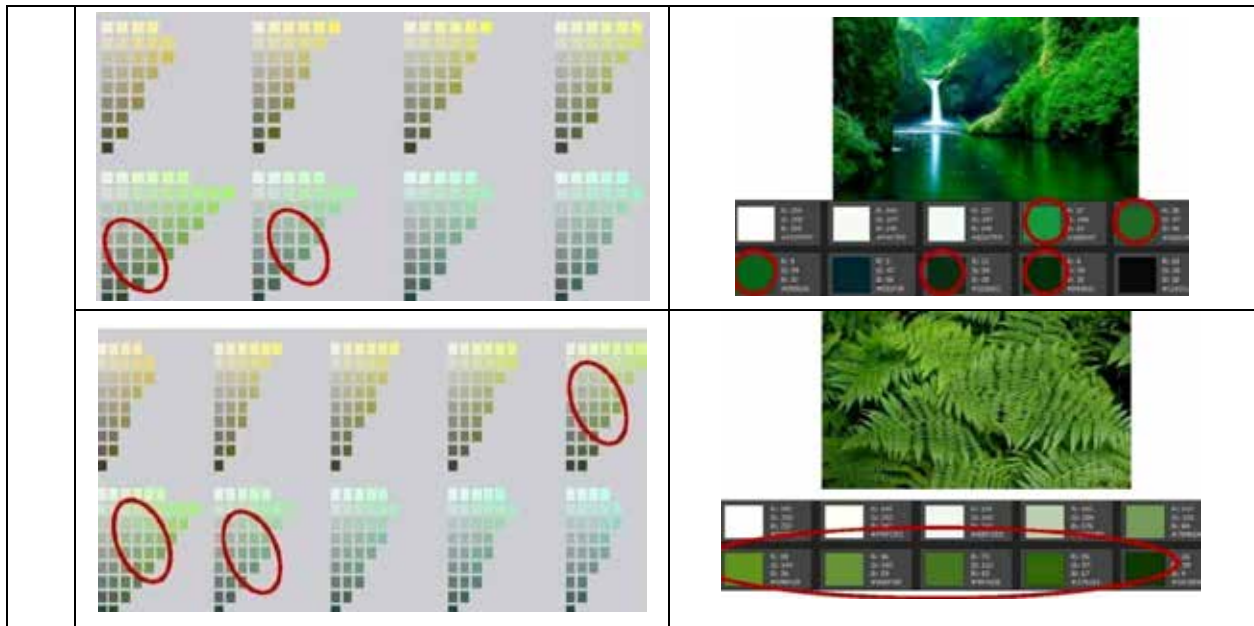
Additionally, and in a more accurate manner the degree of color can be controlled with the previous method, yet within the level of each color code "red (R), green (G), blue (B)", which scales from number zero to 255, to be identical with the place characteristics and as well with the surrounding environment.

The next section of this paper (section 5) shows how to choose colors from this deduced color map through one of the known consensus and tonal variation by using Munsell color pallet.

Table 1. Analyzing some colors of natural elements mentioned in the Holy Quran, on specialized programs And discussing them in Munsell program

CO.	Identifying the color by Munsell model "Munsell"	The elements "indicating" color and their "analysis"
WHITE		
CO.	Identifying the color by Munsell model "Munsell"	The elements "indicating" color and their "analysis"

BLACK		
		
CO.	Identifying the color by Munsell model "Munsell"	The elements "indicating" color and their "analysis"
YELLOW		
		
CO.	Identifying the color by Munsell model "Munsell"	The elements "indicating" color and their "analysis"
GREEN		



CO.	Identifying the color by Munsell model "Munsell"	The elements "indicating" color and their "analysis"
RED		
CO.	Identifying the color by Munsell model "Munsell"	The elements "indicating" color and their "analysis"
BLUE		

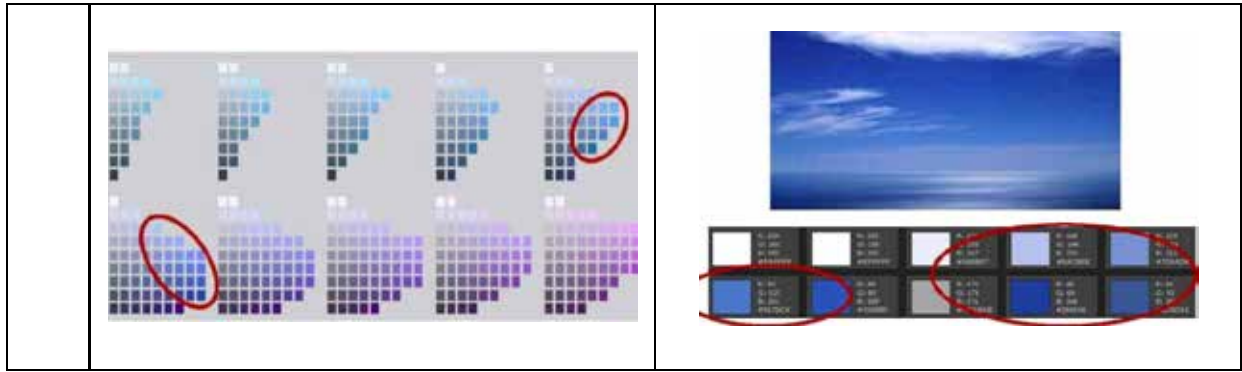






































































































Table 2. The chromatic color map interpreted after being revised and matched on Munsell model

Quran Color	The Color gradients illustrated by the RGB				
White					
	R:229 G:229 B:229	R:228 G:238 B:242	R:242 G:250 B:249	R:250 G:250 B:245	R:255 G:255 B:255
Black					
	R:41 G:51 B:61	R:48 G:50 B:61	R:66 G:79 B:107	R:82 G:89 B:102	R:102 G:85 B:103
Yellow					
	R:217 G:20 B:87	R:251 G:235 B:100	R:245 G:238 B:131	R:251 G:232 B:164	
Green					
	R:218 G:25 B:138	R:219 G:246 B:167	R:221 G:254 B:115	R:225 G:247 B:175	
Blue					
	R:196 G:17 B:37	R:191 G:20 B:46	R:208 G:21 B:80		
Red					
	R:21 G:54 B:28	R:26 G:59 B:4	R:55 G:97 B:17	R:73 G:11 B:43	R:89 G:14 B:36
Black					
	R:4 G:54 B:18	R:32 G:51 B:36	R:45 G:59 B:37	R:48 G:64 B:54	R:64 G:82 B:75
Yellow					
	R:38 G:97 B:48	R:9 G:94 B:32	R:27 G:148 B:63		

Red					
	R:54 G:5 B:2	R:105 G:10 B:3	R:107 G:4 B:8	R:145 G:16 B:7	R:150 G:5 B:9
					
Black					
	R:115 G:96 B:86	R:143 G:109 B:91	R:150 G:128 B:117	R:203 G:170 B:153	R:179 G:148 B:153
					
Yellow					
	R:107 G:66 B:48	R:107 G:79 B:64	R:153 G:84 B:51		
					

Quran Color	The Color gradients illustrated by the RGB				
Blue					
	R:69 G:119 B:154	R:95 G:133 B:158	R:102 G:153 B:170	R:108 G:166 B:156	R:136 G:170 B:171
					
Black					
	R:0 G:85 B:186	R:49 G:89 B:189	R:81 G:125 B:201	R:125 G:154 B:212	R:170 G:204 B:205
					
Yellow					
	R:67 G:187 B:204	R:136 G:222 B:221	R:187 G:238 B:255		
					

5. Towards a Mechanism for Classifying the Color Pallets from the Holy Quran











The color pallets that are deduced and interpreted from the Holy Quran can be divided through a defined methodology to choose them through one of the consensuses and tonal variation known through using Munsell color pallet (as shown in Figure 19), which is as the following [11],[12]:

5.1. Color Harmony

This harmony is done by two means; **The first:** is the monochromatic, who are dealing with colors that have common tone, but have different intensity and saturation, which might cause boredom, "Table 3". **The second:** is Analogous, which is usually formulated from three adjacent colors in the color pallet, such as (yellow, green, and blue),

"Table 4". Thus the analogy takes place as a result of the existence of common color between the other two, which avoids monotony because of its variation.

Table 3. Color Harmony

Quran Color	The Color gradients illustrated by the RGB				
White	 R:229 G:229 B:229	 R:228 G:238 B:242	 R:242 G:250 B:249	 R:250 G:250 B:245	 R:255 G:255 B:255
Black	 R:41 G:51 B:61	 R:48 G:50 B:61	 R:66 G:79 B:107	 R:82 G:89 B:102	 R:102 G:85 B:103

5.2. Color Contrast

It is achieved through the use of separate colors in the color pallet, to produce four different methods, combined as the following:

5.2.1. Direct Contrasted Colors

This is resulting by choosing two opposite colors in the circle like the orange and blue, yellow and purple.

5.2.2. Analogous- Contrasted Colors

Which is resulting from the existence of two adjacent colors in the color palette with the contrasting color to one of them, such as red, orange, and blue where red and orange are two adjacent colors and blue is the contrasted color to the orange.

5.2.3. Separate Contrasted Colors

Which is resulting because of the existence of one color and the two colors that create its contrasting color, for example the color contrasting with red on the palette is bluish green, and thus the two separate colors are green and blue, formulated from red, blue, and green, "Table 5".

5.2.4. Double Contrasting Colors

Table 4. Color Analogous
















Quran Color	The Color gradients illustrated by the RGB				
Yellow	 R:218 G:25 B:138	 R:219 G:246 B:167	 R:221 G:254 B:115	 R:225 G:247 B:175	 R:251 G:232 B:164
Green	 R:38 G:97 B:48	 R:55 G:97 B:17	 R:73 G:11 B:43	 R:89 G:14 B:36	 R:27 G:148 B:63
Blue	 R:69 G:119 B:154	 R:95 G:133 B:158	 R:102 G:153 B:170	 R:108 G:166 B:156	 R:136 G:170 B:171

Table 5. Color contrast by using the opposing separate colors
















Quran Color	The Color gradients illustrated by the RGB				
Red	 R:107 G:66 B:48	 R:107 G:79 B:64	 R:143 G:109 B:91	 R:143 G:109 B:91	 R:153 G:84 B:51
Blue	 R:0 G:85 B:186	 R:49 G:89 B:189	 R:81 G:125 B:201	 R:125 G:154 B:212	 R:170 G:204 B:205
Green	 R:4 G:54 B:18	 R:32 G:51 B:36	 R:45 G:59 B:37	 R:48 G:64 B:54	 R:64 G:82 B:75

Table 6. Classifying the color pallets interpreted from the Holy Quran on the staggered three levels (Cities, Buildings, and Details)

Quran Color		The Color gradients illustrated by the RGB				
Settlements/Cities	White	<div><div></div></div> <div>R:229 G:229 B:229</div>	<div><div></div></div> <div>R:228 G:238 B:242</div>	<div><div></div></div> <div>R:242 G:250 B:249</div>	<div><div></div></div> <div>R:250 G:250 B:245</div>	<div><div></div></div> <div>R:255 G:255 B:255</div>
	Yellow	<div><div></div></div> <div>R:196 G:17 B:37</div>	<div><div></div></div> <div>R:217 G:20 B:87</div>	<div><div></div></div> <div>R:251 G:235 B:100</div>	<div><div></div></div> <div>R:245 G:238 B:131</div>	<div><div></div></div> <div>R:251 G:232 B:164</div>
	Yellow	<div><div></div></div> <div>R:208 G:21 B:80</div>	<div><div></div></div> <div>R:218 G:25 B:138</div>	<div><div></div></div> <div>R:219 G:246 B:167</div>	<div><div></div></div> <div>R:225 G:247 B:175</div>	<div><div></div></div> <div>R:221 G:254 B:115</div>
Squares/Buildings	Blue	<div><div></div></div> <div>R:102 G:153 B:170</div>	<div><div></div></div> <div>R:136 G:170 B:171</div>	<div><div></div></div> <div>R:170 G:204 B:205</div>	<div><div></div></div> <div>R:136 G:222 B:221</div>	<div><div></div></div> <div>R:187 G:238 B:255</div>
	Red	<div><div></div></div> <div>R:115 G:96 B:86</div>	<div><div></div></div> <div>R:143 G:109 B:91</div>	<div><div></div></div> <div>R:150 G:128 B:117</div>	<div><div></div></div> <div>R:203 G:170 B:153</div>	<div><div></div></div> <div>R:179 G:148 B:153</div>
	Green	<div><div></div></div> <div>R:38 G:97 B:48</div>	<div><div></div></div> <div>R:9 G:94 B:32</div>	<div><div></div></div> <div>R:73 G:11 B:43</div>	<div><div></div></div> <div>R:89 G:14 B:36</div>	<div><div></div></div> <div>R:27 G:14 B:63</div>
Details/Ornaments	Red	<div><div></div></div> <div>R:54 G:5 B:2</div>	<div><div></div></div> <div>R:105 G:10 B:3</div>	<div><div></div></div> <div>R:107 G:4 B:8</div>	<div><div></div></div> <div>R:145 G:16 B:7</div>	<div><div></div></div> <div>R:150 G:5 B:9</div>
	Black	<div><div></div></div> <div>R:19 G:17 B:20</div>	<div><div></div></div> <div>R:40 G:33 B:40</div>	<div><div></div></div> <div>R:50 G:43 B:51</div>	<div><div></div></div> <div>R:20 G:33 B:39</div>	<div><div></div></div> <div>R:41 G:51 B:61</div>
	Green	<div><div></div></div> <div>R:4 G:54 B:18</div>	<div><div></div></div> <div>R:32 G:51 B:36</div>	<div><div></div></div> <div>R:45 G:59 B:37</div>	<div><div></div></div> <div>R:48 G:64 B:54</div>	<div><div></div></div> <div>R:64 G:82 B:75</div>

Which are two adjacent colors to two contrasting colors like yellow and orange with purple and blue.

Accordingly, it is suggested to divide and classify these chromatic color pallet into three staggered levels, such as: color pallets on the level of cities, villages, hamlets, and human settlements, etc, and others on the level of streets, buildings, then the level of building minatures in these buildings. These different classifications makes it easier for the designer to choose the suitable chromatic color in any of the three levels, "Table 6".

6. Conclusions

- It is obvious from this research paper a glimpse of the Holy Quran colors according to its diversity, origin, source, and its ability to affect the soul. It shows as well the importance of color _which is one of the elements of formation _in human life.

- Holy Quran identified this importance, some of its verses came to enhance and promote the value of color and ornaments, as God recited: "And the things on this earth which He has multiplied in varying colors (and qualities): verily in this a Sign for men who celebrate the praises of Allah (in gratitude)", (An-Nahl 13).

- The paper suggested a four phases methodology to formulate a chromatic map (based on the Holy Quran verses) that could be an aiding tool in reinforcing the identity, revitalizing, and distinguishing the urban fabric in the Islamic cities and capitals.

- The color pallets which are deduced and interpreted from the Holy Quran could be used with its tonal variations to compose color harmony or color contrast according to the designer point of view when using colors in the built environment.

- It is also suggested to classify colors in the deduced color map of Islamic built environment into three staggered levels, such as: color pallets on the level of cities, villages, and human settlements. Then the level of streets, buildings and finally the level of building details so that it would be easier for the designer to choose the suitable chromatic color in any of the three levels.

This special cultural inheritance ought to be studied, by researchers and specialists to interpret realities, cultural, and historical contributions, to innovate contemporary models to be followed by Muslims in their urban and architecture in the light of Quran and the Prophetic.

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