Methodology for Treating the Current Dwelling to Face the Negative Effects of Corona Pandemic (COVID19)

(Study the state of social housing in the Arab Republic of Egypt)

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Abstract:

Purpose – The paper aims to clarify that Corona pandemic has shown us the negative effects of housing isolation on the current dwelling that was inhabited by many people, as the current dwelling failed to manage the crisis, achieve needs and accommodate the user for long periods, as well as it is necessary to reject these types of inhuman stores that are lacking the basic concepts of housing and the principles of Arab housing, which represents the Arab identity. Thus, it is also required to study modern technologies and methods to develop the current dwelling to be able to resist periods of isolation.

Design/methodology/approach – The methodology study includes three main objectives:
* The first focus is to monitor and diagnose the negative effects (environmental, health, social and economic) on the current dwelling during housing isolation under the Corona pandemic.
* The second focus is on the deductive approach from both the old Arab housing principles and modern technologies to find new methods so that the current dwelling could face emergency changes.
* The third focus is the practical methodology for treating the current dwelling to face the negative effects of the Corona pandemic, reaching to the research findings and recommendations.

Findings – The paper provides practical and analytical insights:
* The old Arab dwelling is one of the most important alternatives for treating current dwelling because of its successful architectural vocabulary, climatic treatments, and spiritual values that make it highly able to adapt to changes.
*It is necessary to reject those types of current dwellings, which have been turned into human stores that lack many basics of housing, cannot achieve human needs and cannot accommodate users for as long as possible during periods of home isolation.

Research limitations/implications – Investors' view of housing units is financial based only without looking to the negative effects of those dwellings on human and the environment, also Many policies of Arab and foreign governments in designing social housing lack the existence of practical solutions and advanced methods that resist the changes, such as Corona pandemic, despite the possibility of solutions that can be economic and suitable.

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Practical implications – The practical implications include the transformation of these human stores into housing units that achieve the basics of housing and resisting domestic isolation in this pandemic.

Social implications – Re-strengthening social ties between neighbors by adding some elements such as the horizontal and vertical courtyards, exploiting roofs of residential buildings and pouring some untapped common skylights floors to be used in many social and recreational activities

Originality/value – This paper is addressing a large population segment at the Arabic and foreign level, which is the medium social housing, who inhabits these units, which are less than 90 meters to find practical economic solutions that commensurate with the possibilities of governments and the level of income of individuals to transfer their homes from human stores to human housing that can resist the negative effects of the Corona pandemic.

Keywords:

Housing, Corona pandemic, Basics of housing , Human stores , Arab housing , Spiritual values , Environmental treatments , Social housing , Domestic isolation , Internal environment quality , Eco-friendly materials, Home farming systems , Leisure spaces , Privacy, Technologies , Modern styles.

الملخص:

الهدف:

- تهدف الورقة البحثية أن جائحة كورونا أظهرت لنا الآثار السلبية علي المسكن الحالي الذي يسكنه كثير من الناس ، حيث فشل المسكن الحالي في إدارة الأزمة وتحقيق الاحتياجات والعزلة لفترات طويلة ، والفراغات الغير الإنسانية التي تفتقر إلى المفاهيم الأساسية للسكن ومبادئ المسكن العربي الذي يمثل الهوية العربية،وبالتالي تتطلب أيضًا دراسة التقنيات والأساليب الحديثة لتطوير المسكن الحالي ليكون قادرًا على مقاومة فترات العزلة المستمرة.

وتحتوي علي ثلاث محاور أساسية: **المنهجية**:

*المحور الأول: التركيز الأول هو رصد وتشخيص الآثار السلبية (البيئية والصحية والاجتماعية والاقتصادية) على المسكن الحالي أثناء عزل السكن في ظل جائحة كورونا.

*المحور الثاني: التركيز الثاني على المنهج الاستنتاجي من كل من مبادئ الإسكان العربي القديم والتقنيات الحديثة لإيجاد طرق جديدة بحيث يمكن للسكن الحالي مواجهة التغيرات الطارئة.

مواجهة التغيرات الطارئة *المحور الثالث: المنهج العملي لمعالجة المسكن الحالي لمواجهة الآثار السلبية لوباء كورونا ، والوصول إلى نتائج البحث والتوصيات.

النتائج:

*يعتبر المسكن العربي القديم من أهم البدائل لمعالجة المسكن الحالي لما يتمتع به من مفردات معمارية ناجحة ومعالجات مناخية وقيم روحية تجعله شديد القدرة على التكيف مع التغيرات.

*من الضروري رفض تلك الأنواع من المساكن الحالية ، التي تحولت إلى مخازن بشرية تفتقر إلى العديد من أساسيات السكن ، ولا يمكنها تلبية احتياجات الإنسان ولا يمكنها استيعاب المستخدمين لأطول فترة ممكنة خلال فترات العزلة المنزلية.

مشكلةالبحث:

- نظرة المستثمر للوحدات السكنية مادية فقط دون النظر إلى الآثار السلبية لتلك المساكن على الإنسان والبيئة ، كما أن العديد من سياسات الحكومات العربية والأجنبية في تصميم الإسكان الاجتماعي تفتقر إلى وجود حلول عملية وأساليب متطورة مقاومة للمتغيرات مثل جائحة كورونا علي رغم أن الحلول تكون اقتصادية ومناسبة.

التداعيات العملية:

- تشمل الحلول العملية في تحويل هذه المخازن البشرية إلى وحدات سكنية تحقق أساسيات المسكن ومقاومة للعزلة المنزلية في هذا الوباء.

الآثار الاجتماعية:

- إعادة تقوية الروابط الاجتماعية بين الجيران بإضافة بعض العناصر المعمارية مثل الأفنية الأفقية والعمودية ، واستغلال أسطح المباني السكنية وصب بعض المناور الغير المستغلة لاستخدامها في العديد من الأنشطة الاجتماعية والترفيهية.

قيمة البحث:

- هذه الورقة تخاطب شريحة كبيرة من السكان على المستوى العربي والأجنبي وهو المسكن الاجتماعي المتوسط الذي يسكن هذه الوحدات التي تقل مساحتها عن ٩٠ متراً لإيجاد حلول اقتصادية عملية تتناسب مع إمكانيات الحكومات والمستوى دخل الأفراد من

تحويل منازلهم من مخازن بشرية إلى مساكن بشرية يمكن أن تقاوم الآثار السلبية لوباء كورونا.

الكلمات الدالة:

المسكن ، جائحة كورونا ، أساسيات المسكن ، مخازن بشرية ، المسكن العربي ، القيم الروحية ، معالجات بيئية ، الإسكان الاجتماعي ، عزلة منزلية ، جودة البيئة الداخلية ، مواد صديقة للبيئة ، أنظمة زراعية منزلية ، مساحات ترفيهية ، الخصوصية ، التكنولوجيات ، الأنظمة الحديثة.

1. Introduction:

Throughout the ages, humanity has been exposed to many infectious diseases that are widespread and have no primary treatment other than isolation, staying in the dwelling, and not dealing except in the narrowest circumstances until a vaccine is discovered, as in Figure 1, but the Corona pandemic has overtaken countries and continents and spread horribly and rapidly, unlike previous epidemics. By staying at home for long, continuous periods, it became clear to us that dwellings in which we live are unfortunately human stores and not human dwellings that meet and accommodate the needs of users and respect their humanity, also news that rejections of various housing projects distributed around the world have multiplied, confirming the rejection of the inhuman architecture that is aesthetically poor and boring formally. The place

in which we live contains within its walls our families, memories, emotions, and childhood, but now, unfortunately, they have become containers for human, (Ali-Abdul-Raouf, 2020).

The amazing thing is that we are still building these kinds every day in our Arab world. But we believe that they are achievements, and we persist in marketing misleading, so we call them flower towers, jasmine buildings, and tree complexes, and they do not apply to anything but brutal buildings that attack the city and contribute to distorting the visual image of urban contexts that seemed much beautiful and better few decades ago.

When we contemplate the genius Egyptian architect Hassan Fathy, who revived the Arab heritage and identity in the concept of housing, which puts a deeper view of the dwelling from a mere cover of protection to a human and emotional space inhabited by humans and inhabited by meanings, feelings, and ideas. What really dazzled Hassan Fathy was the desert's simple person who understands the value of his place, his civilization, his culture, and his appreciation for what expresses his personality and conscience. This meaningful home is an inspiring home which is close to the heart.

Sometimes we are faced with the idea that the Arab countries have a worsening housing crisis despite the expansion of the horizontal space in most countries, but this is not a sufficient justification to forfeit their rights, and even their humanity. Moreover, statistical studies have shown that many Arab cities and countries do not have a quantitative deficit in housing, but a deficit injustice and commitment to the basics of the concept of housing for the simple citizen.

Methodology: The Research

The methodology study includes three main objectives:

* The first focus is to monitor and diagnose the negative effects (environmental, health, social and economic) on the current dwelling during housing isolation under the Corona pandemic.
* The second focus is on the deductive approach from both the old Arab housing principles and modern technologies to find new methods so that the current dwelling could face emergency changes.
* The third focus is the practical methodology for treating the current dwelling to face the negative effects of the Corona pandemic, reaching to the research findings and recommendations.

The Case Study:

The reason of choosing the case study is that housing types are many and have various levels so that the housing which was chosen is inhabited by most of the middle class, which also is represented by the model of social housing, that is repeated in new cities within Egypt and similar to many Arab and international countries in terms of area, possibilities, form, and content. Also some simulation programs have been applied to raise the efficiency of the internal heat performance of the proposed housing spaces, so it is requested to identify one of those residential areas to link their coordinates to these programs. So that one of the existing social housing building in the new city of Minia in Egypt has been selected.

The Research Importance:

Corona pandemic has shown us the negative effects of housing isolation on the current dwellings that are being inhabited by many people, as the current dwelling failed to manage the crisis, achieve needs, and accommodate the user for long periods, as well as it is necessary to reject these types of inhuman stores that are lacking the basic concepts of housing and the principles of Arab housing, which represents the Arab identity. Thus, also require studying modern technologies and methods to develop the current dwelling to be able to resist periods of isolation.

1. Corona pandemic:

The Corona pandemic which is caused by Covid-19 virus, is an infectious disease caused by the last detected coronavirus strain. This new virus was unknown before it began to spread in the Chinese city of Wuhan in December 2019. Covid-19 has now become a pandemic affecting many countries of the world; it is a vast strain of viruses that can cause disease to animals and humans which affects the respiratory system ranging from common colds to more severe diseases such as SARS, as shown in (figure 1).

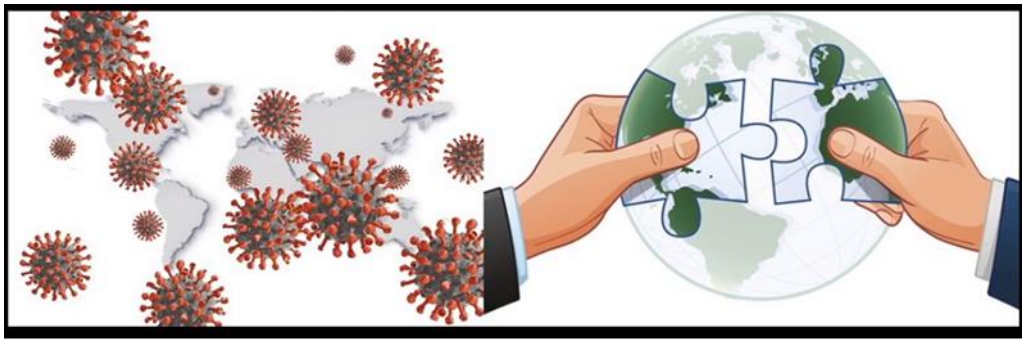


Figure1. show the spread of the Coronavirus to infect many countries of the world

1.1Methods of coronavirus spreading:

People can catch Covid-19 infection from other people who are infected with the virus. The disease is mainly spread from person to person by small catheters produced by the infected person from his or her nose or mouth when coughing, sneezing, or speaking. These droplets weigh relatively heavy, they do not move far away but fall rapidly to the ground and the World Health Organization and specialized medical institutes around the world are still working to evaluate ongoing research on the ways of spreading Covid-19 to find out other ways of spreading and reduce it, (care.gov.eg, 2020)

In case of infection, you should be self-quarantined to isolate yourself from others , whenever you have contacted someone with Covid-19, although you have no symptoms, and you should monitor yourself to monitor any symptoms that may occur during the quarantine. The goal of self-quarantine is to prevent transmission; people who develop Covid-19 can transmit the infection to others immediately, so during isolation time we have to:

• Choose a separate, spacious and well-ventilated room with toilet and hand hygiene supplies.

• If a separate room is not available, place sleeping beds away from each other for at least one meter apart.

• Maintain a distance of at least 1 meter from others, including your family members.

Monitor your symptoms daily.

• Stay in self-quarantine for 14 days, even if you feel you are in a good health.
• If you have symptoms of difficulty breathing, consult your doctor immediately and call first if possible.
• As a matter of stimulating the psychological factor, maintain your positivity and vitality by staying in contact with your loved ones by phone or via the Internet, or by doing some exercise at home

1.2 Effects of Corona pandemic:

1.2.1 Environmental impacts:

The Coronavirus pandemic has affected the environment and climate significantly in several aspects as the sharp contraction in traveling and moving for social and commercial activities has led to a decrease in the level of air pollution in many regions around the world, as well as a decrease in carbon emissions, which scientists estimated, may have saved at least 77,000 living creatures.

It also caused the postponement of the United Nations Climate Change Conference in 2020, so the environmental impacts can be summarized to seven important points as shown:

- **Improving air quality:**

In light of the interruption of most industrial processes in the world, the air quality began to improve significantly. Satellite images showed a decrease in the concentration levels of nitrogen dioxide in the world which is a toxic gas emitted mainly from car exhaust and factories, and one of the largest causes of air pollution in many cities,
as shown in(Figure4).

- **Reducing CO2 emissions**:

Corona's crisis has also caused a drop in carbon dioxide level in air around the world due to the stopping of economic activity significantly in most countries, the rate of emission of this gas decreased, as it happened before during the global financial crisis in 2008. In China alone, this gas concentration in the air decreased by 25 percent, according to what was reported by the "Carbon Brief" website as shown in (figure 2), but this decrease is expected to be for a temporary period until the economic activity returns normally.

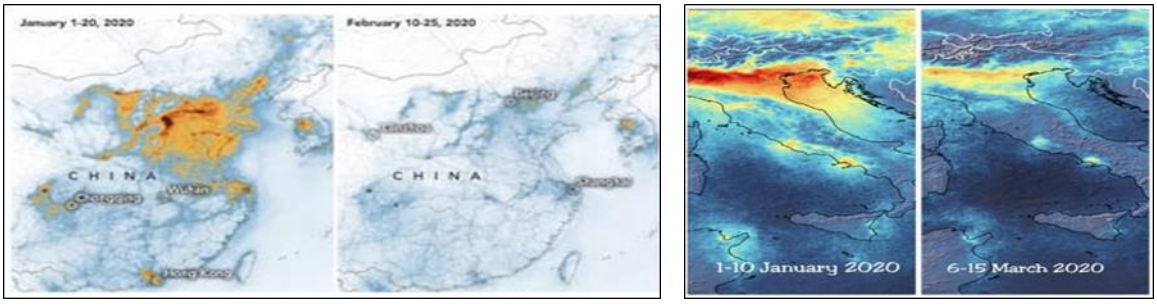


Figure 2. The Retreat of smoke clouds saturated with nitrogen dioxide and carbon dioxide from factories and fuel combustion over china city and Italy.
Ref. https://www.carbonbrief.org.

- **New World for Animals in Empty Cities:**

While humans were isolated in their homes to try to control the spread of corona, some animals became open to discover the world during the human absence. The lack of traffic in streets saved young animals that started to wake from their winter slumber, like hedgehogs, from running under the wheels of cars , also ducks because of the lack of bread crumbs in the gardens has led them and other birds to search for food in other places by themselves, as shown in (Figure 3).

Figure 3. New World for Animals in Empty Cities.

- **Raise awareness about wild animal trade:**

Environmental scientists hope that the Coruna virus will reduce the wild animal trade around the world, as this trade threatens many species to extinct. Scientists also believe that the new coronavirus appears in one of the wild animal trade markets in Wuhan, China, which is a hub for both the legitimate and illegal trade for these animals.

- Water cleanliness:

Cleanliness of water after Italy announced the procedures for complete closure, images of water channels spread from Venice, where the water appeared pure without impurities for the first time. This is due to the lack of movement of tourist boats, after they stopped moving sediments to the water of the city. The lack of transport ships in seas gave the marine creatures such as whales to float quietly and without disturbance.

- **Increasing plastic and medical wastes:**

Not all recent environmental changes have been positive. One of the negative effects of the pandemic that it has led to a dramatically increasing in plastic wastes, from medical gloves to bottles. This is due to the using of packed meals. Even cafes that were encouraging customers to bring their cups to save the environmentally harmful plastic cups stopped this service for fear of spreading the infection.

- **Ignoring the climate crisis**:

The issue of climate change was firmly on the scene before the appearance of Coronavirus, but it has disappeared since the start of the pandemic. This does not mean that it has become less important, as experts warn against delaying important environmental decisions, despite the postponement of the United Nations Climate Change Conference to next year. Although thermal emissions have decreased since the beginning of the Corona crisis, this improvement is likely to have a strong impact on the long run.

1.2.2 Social Impacts:

Global health experts expected that the best methods that were used to avoid spreading corona virus are social isolation and non-mixing to reduce the rate of infection and give the health sector an opportunity to face the pandemic in addition to the early diagnosis of the disease, also

from the most important social effects that have occurred during this period as following, (Ali-Abdul-Raouf, 2020) **and as shown in (figure 4):**

•Isolation, excessive privacy and spending long-term in residence.
• Spreading fear from one another concept.
•Lower many families' income in general.
• Many companies lay off workers, which has led to increasing unemployment equations.
•Low marriage rates.
• Increasing many psychological diseases as violence.
• Decreasing education level due to the weakness of networks and communication ways, as well as the lack of good trainers to deal with these systems and programs.

Figure 4. social effects that accrued in long isolation periods because of corona virus

1.2.3 Economic impacts:

As the spread of the virus caused negative effects on the economy and led to a global economic recession and the most important of those effects that can be mentioned are the following:

• Impeding global trade movement.
• Weak global demand, especially oil demand.
• The economic and production sectors were completely paralyzed.
• Lacking confidence levels, which caused collapsing of several major global financial markets.
• Severe impacts on the four main sectors for food security specially in developing countries, which are the availability of food, reaching of food, using and nutritional dimension, and stable supplying.
• Depression and unemployment due to large periods of house isolation or compulsory leave or dismissal.
• Withdrawing large amounts of money from banks.
• Partial and complete pauses in import and export process between countries.
• The disappearance of some commodities from markets due to the withdrawal and storage process.
• Direct effects on construction sector started to appear in the form of projects delay, especially in the implementation phase, and it is expected that these delaying will extend even after the removal of the direct ban due to the descending of the operational capacity that will result from the safety and preventive measures that will be imposed during the coming months.
• suspending or canceling some projects will be due to the fundamental changes that may occur in some businesses and other sectors, also the weak cash flowing, restrictions on international movement of people and goods will lead to disruptions in supply chains at different levels (Ali-Abdul-Raouf, 2020).

2. The Environment Definitions:

The environment can be defined in a simple way as all that surrounds man from air, plants and animals, and man has become dependent on the natural environment to satisfy his basic needs of food, shelter and clothing, also the elements of natural environment acquire their value and meaning through the human needs of it and its stage of cultural and technological development in a region, for example, the rubber trees in the Amazon basin had little value until the man discovered the benefits of the various rubber, and iron ores gained importance and value after the development of the processes of taking advantage of these raw materials at a small cost.

2.1 The sociology Definition of the environment:

This definition refers to the social, economic, legal, environmental, administrative and economic management systems, with their social data, and their economic indicators (Academy of Scientific Research, 2015).

2.2 The psychology Definition of the environment:

This definition refers to the studying of the relationship between the environment and human behavior in a holistic manner, even though the word Ecology was introduced in the field of science, which is the mutual relationship between human existence and the environment.

2.3 The public health science Definition of the environment:

This definition is consistent with the linguistic definition of it in the dictionary, as it is the physical environment that surrounds a person and on which he depends for the continuation of his life. To deal with crowding due to reducing the spread of tuberculosis, improving ventilation, natural lighting, and sunlight entering in every housing unit, along with setting standards to provide clean water and provide proper drainage, all of this to reach a healthy residential environment, and the matter has evolved in the 1990s.

Housing construction laws related to health, and safety of individuals have been enacted and they are now based on health and safety of building materials - design - construction method - environmental building performance such as (ventilation, lighting, and thermal insulation), but in developing countries most homes are subjected to these legislation pertaining to health and safety systems in design and building materials, and there is not even architects' monitoring of their housing products (Academy of Scientific Research, 2015).

2.4 The Definition of the environment in the field of urbanization:

The built environment is defined as the three-dimensional constructed for human environment, which is dominated by man-made elements of architecture and urbanism. It is the environment whose components are the buildings, architectural formations and components of the external architectural squares and spheres and movement networks (Academy of Scientific Research, 2015).

3. Housing:

3.1Dwelling definition:

The word "dwelling" in Arabic comes from dwelling or silence, it also means stopping movement and calmness of the soul, so God Almighty said, **"He is the one who sets the night for you to dwell in"**, also **"and from whom he created for you of yourselves husbands to dwell in",** and **"He has made for you a dwelling from your homes."** From the above, the house in the general sense is a person's cell and his private dwelling, it is a place of security and a refuge from the open world from nature and climate, and also from external pressure.

While the dwelling definition in architecture is the space that is defined by fixed elements represented in the walls, ceilings, floors, and other semi-fixed or movable elements, like furniture.

And as for the urban definition, it is a dedicated space that represents the protected environment of a human being that he coexists with and within that interacts with time to become an integral part of it. Activities related to the psychological needs of a person, considering that dwelling is the place to which a person can do the following:

- Practice one or more daily residential activities.

-Feel safe.

Feel attached to the place and thus develop a sense of belonging.-

3.2 Describing problems of the current dwelling:

Diseases that affect the dwelling, directly or indirectly, differed, whether it was due to natural phenomena, building materials, or due to the bad behavior of individuals.

3.2.1 The relationship between the dwelling and the surrounding environment*:*

What is meant by natural phenomena, that are any emergency phenomenon that causes disease or damage to the dwelling, for example:

1- The Foundation soil:

The soil type and the degree of its stability and if it contains pollutants such as radon, which is a radioactive gas that has no odor or color and reaches inside the dwellings through cracks and causes lung cancer.

2-The dwelling site from sources of health pollution:

The proximity of residential units to garbage dumps, power stations, factories and streets crowded with transportation increase exposure to noise that leads to poor hearing, lack of focus and difficulty in communication, as well as the concentration of car exhaust may lead to nervousness and affect the IQ of children.

3- Failure to provide basic services:

The interference of sanitation networks with the drinking water networks, which causes many diseases, as well as disposing of garbage in the drainage drains, which leads to blockages and many health problems.

4- Dimension of basic services for dwellings:

The problem of the remoteness of the service center from the dwelling, especially when crises and disasters occur as shown in (figure 5), as it is necessary to change the concept of centralization of services in planning and to provide basic services (food, drink, and medicine) near small residential communities, where they are easily accessible on foot or by using simple means of transportation such as bicycles. (Taya, 2017).

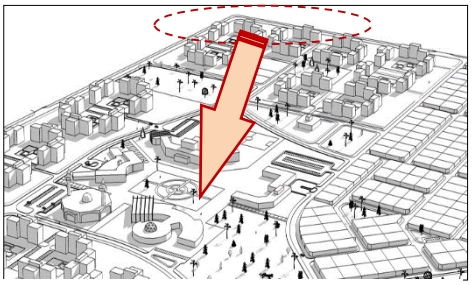


Figure 5. The remoteness of the services center from the dwellings.

5-Respect law and heights:

Recently, a culture of disrespecting building codes has spread concerning heights and a commitment to the height of the building's façade at a distance of one and a half times the width of the street, as well as neglecting the spaces between buildings as shown in (figure 6), which affects public health and lack of social interaction. America woke up to the news of the bombing of a giant housing project, the bombing was not a terrorist act, but an official act that the government at the time oversaw in St. Louis for more than four decades, for the same reasons.

Figure 6. Disrespecting building codes, heights, and spaces between buildings.

3.2.2 Describing designing problems of the current dwelling:

1-The Internal environment quality:

According to natural ventilation and natural lighting, those considered one of the health requirements that windows allow air and lighting to enter in sufficient quantity in all rooms to renew the air and sterilize it using sunlight, but it is noticeable in the last period there is no attention to the design of suitable openings for ventilation and natural lighting and to depend on industrial lighting and central air conditioning, as the windows are not allowed to be opened, residents may experience many symptoms, including psychological distress, eye, and nose irritation, headache, lack of concentration, and it can also cause mass hysteria.

2- The used materials for building and interior finishing:

The materials used in construction and materials as asbestos shown in (figure 7), which is used in interior finishes and may be a source of indoor air pollution, as it has been proven that adhesives, insulating materials and some paints can cause chemical pollution with formaldehyde, as well as asbestos panels and heat and sound insulators that cause respiratory diseases, (Maarouf, and Mohamed, 2010).

Figure 7. Using asbestos as a building and finishing material.

3- Functional Design Efficiency:

a. The Flexibility of internal spaces:

concerning internal spaces, where the level of housing has decreased until we live in small human stores, the area does not care about the human scale and does not care also about meeting the needs of the user but it is only concerned with meeting the needs of the real estate investor in securing the largest number of housing units with small narrow spaces. Also, the randomness of choosing colors in internal spaces led to a feeling of psychological discomfort, which negatively affects home isolation and increases depression, which causes mental illness and distress, and these dwellings turn into places of severe isolation.

Also, most of the furniture and interior items are not subjected to continuous cleaning and sterilization, as the used materials create an environment suitable for the spread of diseases.

b. The availability of recreational and social spaces:

where there is no interest in social and recreational spaces for several reasons, the most important of which is the high altitudes, which led to the non-exploitation of social spaces between buildings if any, and there was no interest in making the simplest recreational and social spaces, balconies and transforming them into residential towers due to the narrow internal space and without taking into account communication with the outside, especially during periods of domestic isolation, as the balconies played a great role in the recreation of users during periods of home isolation in most European countries, especially Italy and Spain. Many of the balconies were used for recreation and entertainment for all residents of the area, where pieces of music were played through the balconies. As for roofs and skylights, unfortunately, they are not exploited, as the roofs have become places for storage, air dishes, and cabinets as shown in (figure 8), and for residential skylights they have become illegal and smaller and were inhabited by insects.

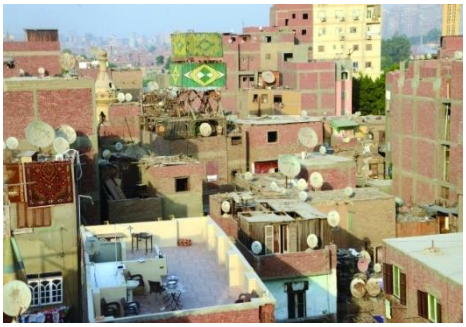


Figure 8. Neglection and non-exploitation of residential roofs

C-Privacy:

Failure to make flexibility in movement within the dwelling and fail to provide privacy, as the outlaw skylights with narrow spaces have led to losing the basic function in achieving the good outlook and losing them to achieve the privacy of spaces, as there is no residential privacy as shown in (figure 9), Also, the priority for providing comfort in the current dwellings is to provide spaces to receive guests and take care of them at the expense of the permanent users. The Corona pandemic has revealed that the dwelling we live in is designed for guests and not for us.

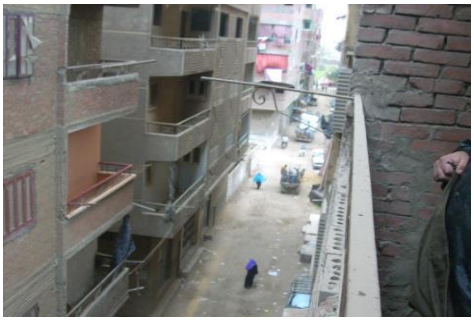


Figure 9. Losing the basic function in achieving the good outlook and not providing privacy

3-2-3The dwelling relationship with individuals' behaviors:

Individuals' behaviors play a direct and indirect role in the spread of diseases in the dwelling, among these examples as shown in (table I):

1- Not to ventilate the home or expose the furniture and individuals to the sun.

2- Randomness in colors, visual morphology, and lack of taste in individuals.

3- Contributing to the existence of stagnant water pools (by not disposing of sanitary water properly) and maybe a focal point for the proliferation of mosquitoes and diseases.

4- Unhealthy disposal of garbage and this behavior helps the proliferation of insects that transmit diseases and emit unpleasant odors.

5- Professional activities inside the residence:

Some household chores that help raise the standard of living may affect health, such as some small industries in which adhesives and flammable and toxic materials are used that may be accompanied by a lot of stress and may be unsafe or cause noise and a rise in the temperature of the house and increase the emission of harmful air pollutants inside the dwelling, as well as raising pets, poultry and livestock that cause many diseases such as bird flu.

			
Transferring yards between buildings to dump garbage and building violations.	**Converting rooftops for poultry, birds, and pets.**	**The spread of bacteria and fumes due to its transformation into a small factory to produce some products.**	**The spread of diseases and epidemics in the current housing due to poor infrastructure and sanitation.**

Table I. Examples of Individuals' behaviors which play a direct and indirect role in the spread of diseases in the dwelling.

3-3The old Arab Dwelling:

The old Arab dwelling is a kind of dwellings designed, implemented and managed in a manner that considers the environment, as the main goal of these buildings is to reduce the negative or destructive impact of the role of housing on the environmental, human, social and spiritual system to the least possible limits, as well as to reduce costs of its construction and operation, for the reason that environmentally friendly available local building materials are used. From the most important concepts of Arab dwelling design; **from the researchers' point of view are the following:**

1-Reducing energy consumption and preserving people's health, but also improving it to become an integrated sustainable design.

2- Avoid duplicating design ideas and dealing with each site according to its environmental systems and site conditions.

3- The view of the designer of the old Arab dwelling was not limited to the building elements only, but he was considering the organic environment surrounding the place and the spiritual environment.

4- The designer of the old Arab dwelling was interested in choosing building materials and studying the energy resulting from the building's activities and the expected effects. Therefore, spaces were created for various social activities such as summer seat and winter seat other than the Haramlek and Salamlek.

3-3-1The old Arab dwelling designing principles:

The old Arab dwelling was characterized by comprehensiveness in dealing with the natural environment and the built environment as well as the users of the house, and the old Arab housing was seeking to establish healthy environments free of pollution by choosing the local used valley in building the house and rationalizing energy consumption and providing the needs of the home users. The following are the most important principles of Arab housing architecture (Mohamed, 2001).

1- Site selection studies:

As the Arab housing architecture was concerned with the necessity of harmony between the shape of the building and the surrounding nature and its climate as well, the designer stressed on respecting the site by using methods and ideas that preserve the features of the building site and not to make fundamental changes in it (Aldeberky, 1999).

2-Well-efficient design:

The ancient Arab dwelling has achieved continuous efficiency in the relationships between the formation of the building, its location, the construction technology, the study of the external envelope of the building and the extent of its energy conservation, the study of the spaces used and the paths of movement, as well as the symbolic expression of the history of the region, as well as the values and spiritual principles, they were all considered (Mohamed, 2001). The Arab housing has also taken into account the importance of the health and safety of the dwelling users so that the house becomes distinguished by its quality of construction, ease of use and function in addition to the beauty of the form, it places a priority on health and the environment to preserve the resources and the performance of the building during its life cycle, so most of the old Arab dwellings are considered efficient with outstanding quality. This is because its service life is longer than its counterpart in our time and its operating and maintenance cost is lower in addition to providing a higher degree of satisfaction to its users (Alazzawi, 2008).

3- Environmentally friendly building materials:

The old Arab dwelling used local building materials, which led to a reduction in the destruction of the environment and this is due to the low emissions of these materials, as they are materials that do not have harmful gases, their toxicity decreases, and their useful life is prolonged with the ability to produce them locally and the possibility of recycling them for reuse again, from the materials of domestic used clay, stone, and others (Aldeberky, 1999).

4-Energy Efficiency:

The old Arab dwelling took measures to ensure that the building uses the least energy possible in lighting and ventilation operations, relying on the idea of openness to the interior through internal courtyards and air hangers, using thick walls and taking care in choosing the shapes and areas of coverings and openings to obtain good natural ventilation and the continuous and optimal orientation of spaces according to use, as well as concerned with reducing temperatures in the summer and softening the air by using the water element from fountains and in the walls of the southern facades, as well as using the plant element, which in turn purifies the air from the absorption of carbon dioxide and the emission of oxygen and also lowered temperatures (Alazzawi, 2008).

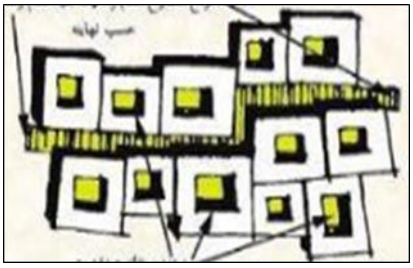
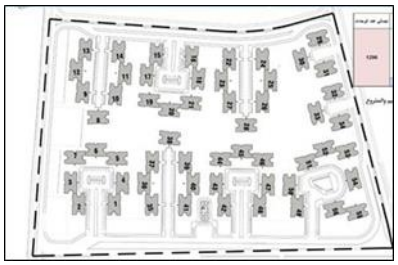
5- Observance of spiritual values:

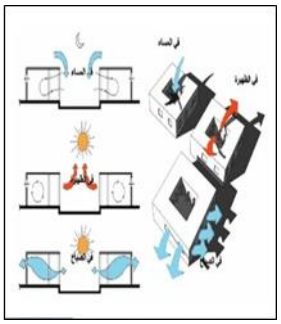
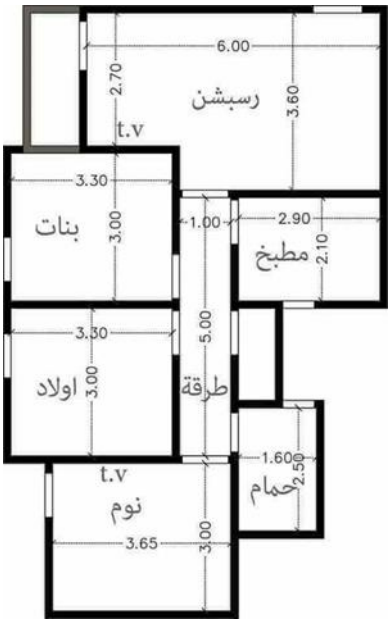
The old Arab dwelling was linked to the human values that dominate the culture of our Arab society. (Mohamed, 2001) Our identity requires transformations in our beliefs and actions contrary to Western society, such as violence and independence from the family and the concept of communication and interdependence of generations from grandfather to grandchildren and other generations. To lay down the concepts and values of developing a spiritual sense in the Arab society and achieving the principle of social justice by obtaining happiness with the least used potential.

4-An Analytical comparative study between the case study which is the current dwelling (a model of social housing in the new city of Minya) and the old Arab housing

as shown in (table II):

	The status of the old Arab housing	Current housing status (Social housing unit in Arab Republic of Egypt in new Minya city)
First: The relationship of the	When choosing the old Arab cities, it is stipulated to be healthy, environmentally and climatically appropriate to be reached and taking in consideration to be close to water sources and to be located on a high place (Barakat and Nazly, (2013).	Not all environmental and climatic requirements have been considered in choosing the location of the new cities, but according to the easy way of access and their proximity to the nearest infrastructure, regardless the place of these new cities whether they are inside deserts, or at the bottom of the river and so on**.**

	The form of housing within the urban designing	Arab city planning has been characterized by its Solidarity planning as most Arab countries are characterized by their hot climate, where houses are closed to each other to be protected from solar radiation, dust, and winds and it also leads to reduce walking and transportation distances and making pheasant for spaces and squares of the yard, the neighborhood, the alley, the kasbah, and the large squares around the mosque, and it has several environmental and social benefits (Alzirkany, 2006). 	The planning of most new cities did not take into account the environmental conditions and the hot climate, which advice to make blocks as close as possible from each other within the housing complex to protect from solar radiation and sandstorms, and it has resorted to opening to the outside and separating the buildings from each other with large areas and a wide network of roads more than required (Barakat and Nazly, 2013), as shown in Planning a group of social housing in Minya Governorate, in New Minya City. 
	Respect laws and heights	Arab housing relied on the principle of respecting the neighbor and not become arrogant in the structure, as it was characterized by horizontal expansion and using spaces between buildings to benefit from them socially and environmentally, such as an Arab city (Ghardaia, Algeria). 	Culture of non-respecting building codes and laws has spread concerning heights and commitment to the height of the building façade equivalent to one and a half times the width of the street, as well as neglecting the spaces between buildings, which affects public health and lack of social interaction, and the urban fabric is characterized by a vertical, random sprawl. 

<table>
<tr>
<td rowspan="2">Design description of the dwelling</td>
<td rowspan="2">Indoor environment quality</td>
<td>Paying attention to natural ventilation and natural lighting, as the Arab home has followed health requirements better than the current housing, as there are many openings that allow air and light to enter in an adequate quantity in all rooms with the aim of renewing the air and sterilizing the use of sunlight (Alshahind, 1989), among the most important architectural elements used:
<u>The central courtyard</u>
<u>The air catcher</u>
<u>The sistrum</u>
<u>The Mashrabiya:</u>
<u>Openings (Qamarya)</u>
Each element will be explained as the following:</td>
<td>Internal spaces are very narrow as it does not care about the human scale, does not meet the needs of the internal user, and the internal design is not flexible.
  </td>
</tr>
<tr>
<td><u>The central courtyard</u>
The central courtyard which works as a thermostat as it is the best environmental solution used in the Arab dwelling, which is considered one of the best spaces for housing.
  
<u>The air catcher</u>
The air catcher which works by turning the air from the north direction and descending into the bad vacuum in its ventilation, and it is one of the genius environmental solutions which was used in that period of time (Yehyawy,(2006) .</td>
<td>Example of a social housing unit (60m^2) shows the very narrow spaces that couldn’t be properly furnished and can’t achieve the users’ needs.
 
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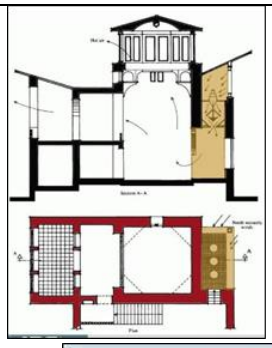
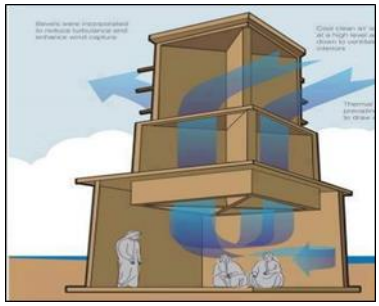
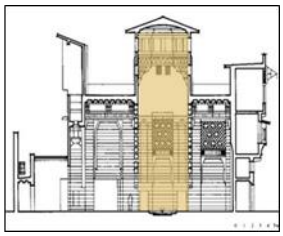




The sistrum

It works to get hot air out from its openings at the top and keep the cool one that was moisturized because water is below it and its floor level is less than the floor of the spaces around it.

The Mashrabiya

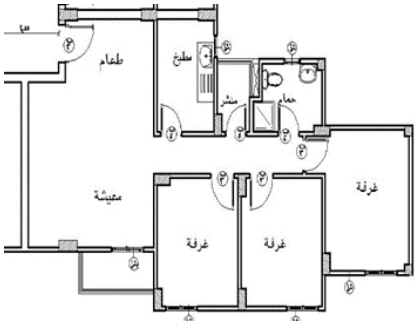
It is a unit instead of the window, the idea of the wooden Mashrabiya is included in its openings, which have the function of air-clearing and its speed in entry, as well as a role in establishing the principle of privacy, as it is one of the environmental solutions, (Alshahind, 1989).


Openings (Qamarya):

It plays the role of net windows as it has a role in lighting and ventilation. It has also distinctive shapes due to the colored


Lack of designing the appropriate openings for ventilation, natural lighting, and reliance on artificial lighting in most cases as air conditioners in general, where it is not allowed to open windows to have good ventilation.

Also, the natural ventilation and natural light openings do not play their role due to the contiguity and proximity of buildings that are not considered.



		glass, small openings, and the application of an idea of shade, as it is one of the environmental solutions.  	
		Arab housing relied on local materials that are available in the surrounding environment and environmentally friendly, which can be recycled and used again. Including mud bricks, which is considered one of the best natural building materials that can provide thermal insulation to the building, as well as limestone, which helps to keep the internal spaces on its cool air, as well as wood, which is a good heat insulator in making flat and sloping ceilings. (Arab Planning Institute, 2010). 	Use of building and finishing materials that are harmful to the environment and human health, which do not provide the required insulation, as they are a source of air pollution inside the house such as asbestos and heat and sound insulators, which causes many diseases. Also Importing many materials and not depending on local materials. 

		The old Arab dwellings had a character, identity, and flexibility in designing their different spaces, which make them similar to the principles of green architecture. The flexibility of the design resulted in a variety of uses of the spaces for the Arab dwelling, such as the arches, domes, the inner courtyard, winter, and summer seats, the Haremleks, the phalanx, and the Takhtboush, and with all these spaces, the social, environmental and human dimension were taken into account (Yehyawy, 2006).	The current residential units have become small, narrow spaces, not capable of integrating or separating internal spaces for use in crises that negatively affect home isolation. Most of used furnishings and interior furniture items are difficult to complete the continuous cleaning and sterilization process for it, as well as the elements are not versatile to be used for more than one function to save spaces and facilitate the cleaning and sterilization processes.

	The availability of recreational and social spaces	Old Arab housing is interested in recreational and social places while preserving user privacy, one of the most important of these spaces are as follows: **Al-Takhboush space** The most important feature of it is that it is between two courtyards, which allows the passage of air flow, and is considered one of the best spaces for sitting in the Arab home to entertain or strengthen social ties **The seat space (Meqad):** The vacuum is characterized by strengthening the social ties of the family. It is in the upper floor and overlooks the courtyard and is characterized by its good ventilation. 	There is no interest in social and recreational spaces such as roofs and skylights, as these spaces have become places for storage, and for air dishes. **The balcony:** Turned into a storeroom for garlic and onions, a clothes hanger, and a discarded space. **Sky lights and court yards** Courtyard: it was turned into a dumpster for garbage and trash and not being exploited to be a place for entertaining social gatherings.

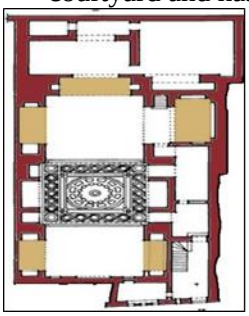
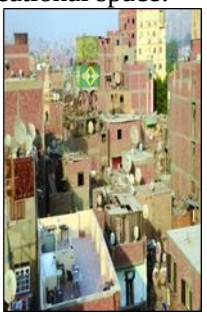
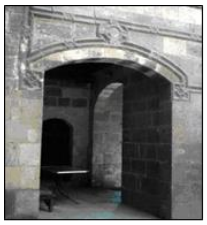
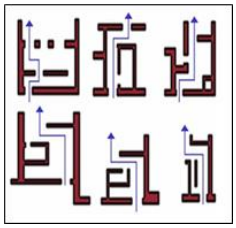
		The Iwan The Iwan is distinguished as another social space that breaks the boredom of sitting in the seat, for example, and it can overlook the courtyard and has good ventilation.  	**The Roof** Converting the upper surface of the buildings to be a store for water tanks, air dishes and not using it as a social and recreational space.  
		The main entrance of the old Arab dwellings: Assigning the principle of privacy to the idea of the main entrance of the dwelling so that the residents of the dwelling are not exposed. (Yehyawy, 2006)  	**The entrances of the residential units:** The entrances of the four dwelling are adjacent at the same floor as the principle of privacy is not achieved. 
		Haramlek(female) and Salamlek(male) areas: Achieving the principle of privacy in the Haramlik and Salamlek areas is evident in small or large Arab residences.  	**The convergence of residential units on the facades:** The proximity of residential units to the facades to the point of climbing among young neighbors, which abolishes the principle of privacy. 
Spiritual values		The old Arab dwelling was linked to the human values that dominate the culture of our Arab society. Our identity requires transformations in our beliefs and actions contrary to Western society (Mohamed, 2001).	The current dwelling lacks the internal comfort of the user, as it lacks social cohesion through the non-cooperative fabric in planning to strengthen social cohesion between individuals, reduce distances and facilitate the process of transition between internal and external spaces.

Table II. An Analytical comparative study between the case study of social housing unit and the old Arab housing.

5-The current housing proposal addressed to combat the Corona pandemic (the case of the social housing study at the level of the Arab Republic of Egypt, specifically the new city of Minya):

From the researchers' point of view, adequate housing is a housing that provides the basics of the main principle of housing, including protection, flexibility, and adaptation to the change that may occurs in the dwelling.

5-1 Social housing:

These are housing units suitable for a specific category, who are middle-income earners, and these models are available in most of the new cities in the Arab Republic of Egypt, where the area of the housing unit ranges according to the model where four units in the floor between 45 meters: 80 meters, and it is inhabited by a family whose number ranges between 4 to 6 individuals

(Abu Al-Wafa, 2017).

5-2Reason for choosing a case study:

These units address a large class of middle-income groups.

- These models are uniformly designed as government projects that are repeated in most new cities to facilitate the implementation of proposed amendments to them in proportion to the economies of the used category.
- Some of these models are under implementation, which facilitates development and treatment processes.
- The ease of legislating of these amendments and proposals, as the state is the main financier for them, represented by the Ministry of Housing.
- This type of housing is similar in many Arab and international countries in terms of area, capabilities, shape, and content, so development proposals can be applied in line with the situation of each region.

5-3Developed and Treated Methodologies:

The developed study of the current social housing relied on two main axes as shown in (figure 10):

- Devising some of the principles of the old Arab habitat from architectural vocabulary, environmental and spiritual treatments, in a way that suits our present time.
- Adding some simple modern technologies and methods of treatment, considering the cost proportional to the target group**.**

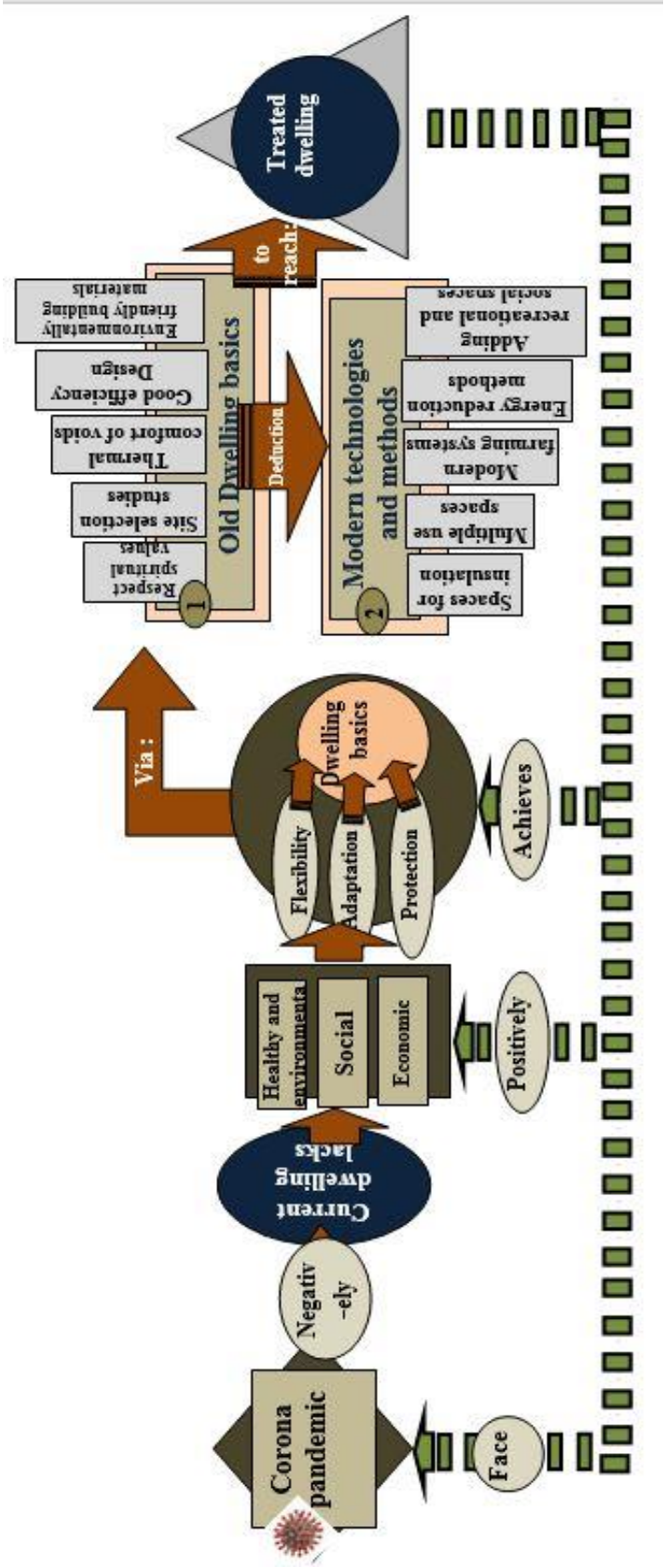
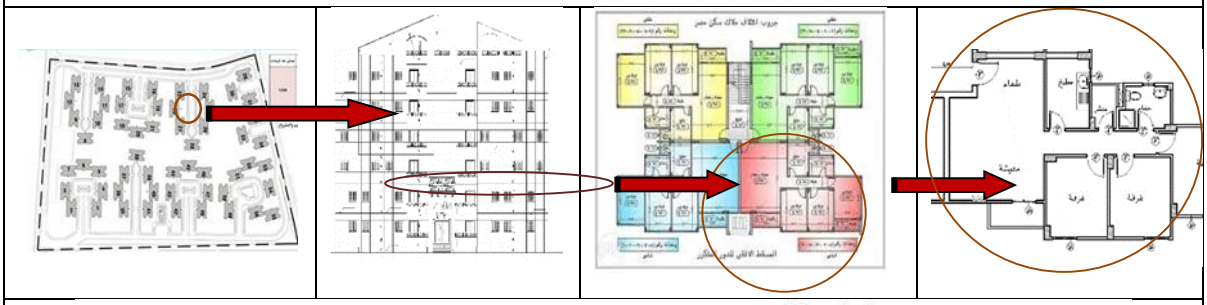
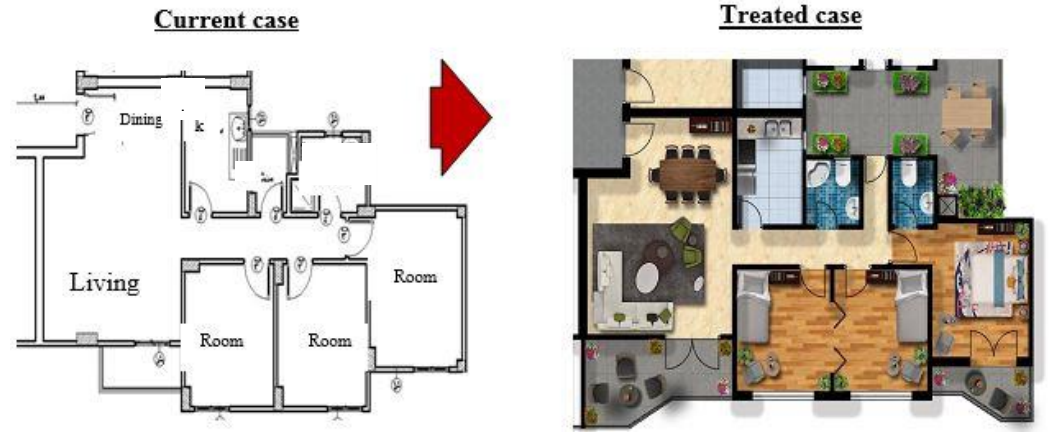


Figure 10. Developed and Treated Methodologies suggested by the two researchers

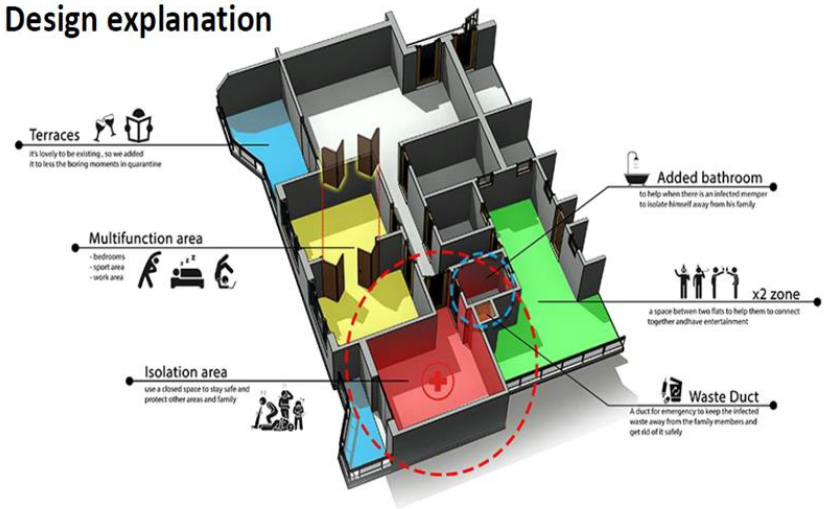
5.4 Methods and Modern technologies that are used in the treated current housing (social housing) to combat the Corona pandemic as shown in (table III).

Methods and Modern technologies that are used in the treated current housing (social housing) to combat the Corona pandemic:





Adding simple architectural modifications to the chosen residental unit in order to resist harmes caused by isolation for long periods of time resulting from the Corona pandemic, the most important of them are as following :



1. Exploiting Multiple Use Spaces and Furniture.
2. Using Modern Farming Systems.
3. Adding Recreational and Social Spaces as Terasses.
4. Using Energy Reduction Methods.
5. Allocate Spaces for Isolation in Case of Infection (room, private toilet, wastes duct, Terrace).
6. Using Materials that Decrease Infection Transmission.

Multiple Use Spaces and Furniture 1. Exploiting





The spaces are designed to be used for more than one purpose and they are flexiable that can be put together or separated in order to avoid the small area of the unit (case study), as the bedroom space contains an area for reading and another for exercise using one of the simple sports equipment. There is also a place for studying and watching TV and another place to sleep. All these different activities can be Provided in the same space by means of the flexible internal design of the spaces and using the multi-use furnituer elements.

Modern Farming Systems 2. Using






spinach

Tomatoes

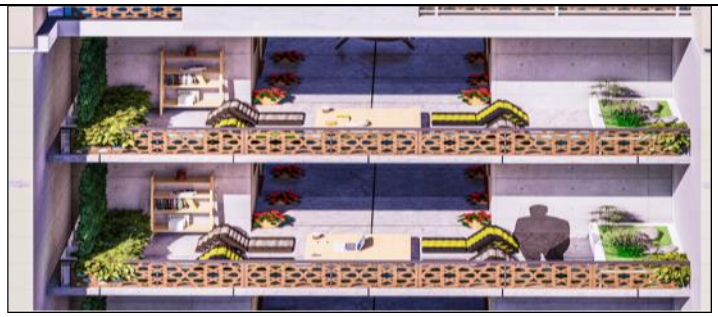
basil

potato

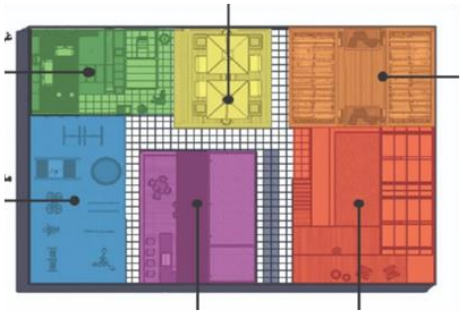
Mint

Addition of modern farming systems that affect psychological comfort in all spaces of the house as well as smooth out the interior climate. Also planting Some types of fruitful plants that can live inside the house and can meet some simple needs in the case of home isolation, which also plays a major role in calming the internal climate and gives psychological comfort to the users.

3. Adding Recreational and Social Spaces

It was suggested to add recreational places within the residential units by adding different terraces and providing them with various activities to serve as recreational places to spend periods during home isolation. Also, these terraces have a great benefit in increasing the percentage of natural ventilation of internal spaces as well as working to enter a greater amount of sunlight which helps in sterilizing the voids and protect them from viruses.

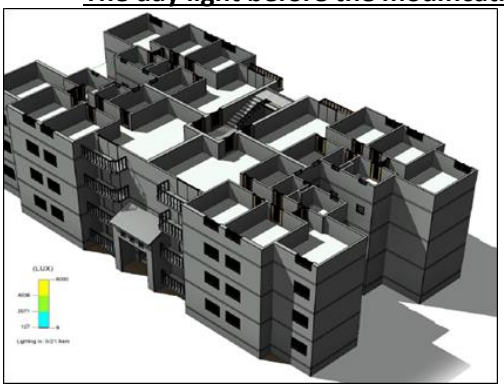
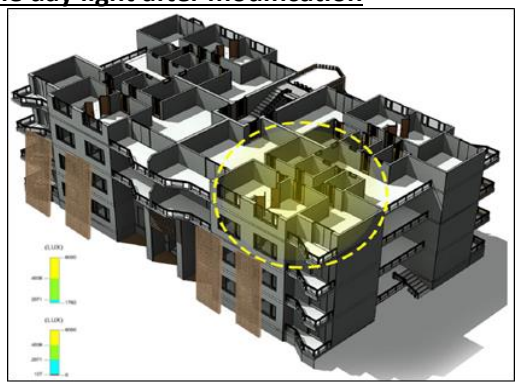
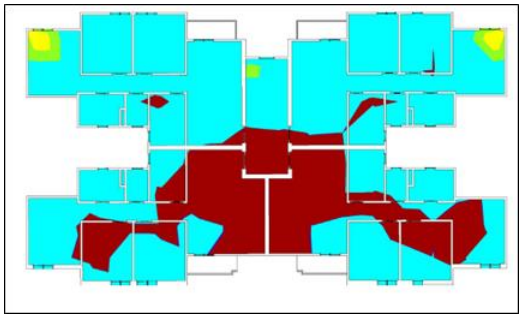
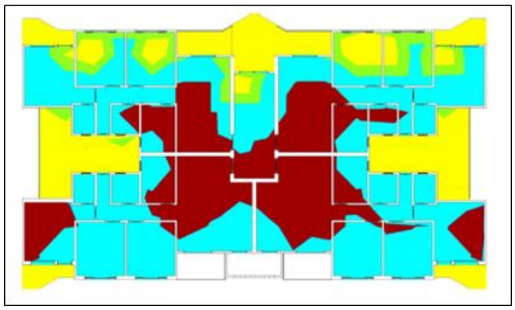
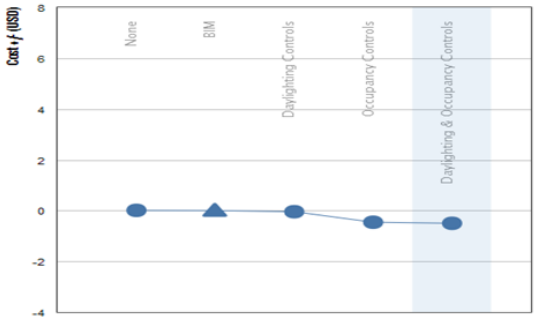
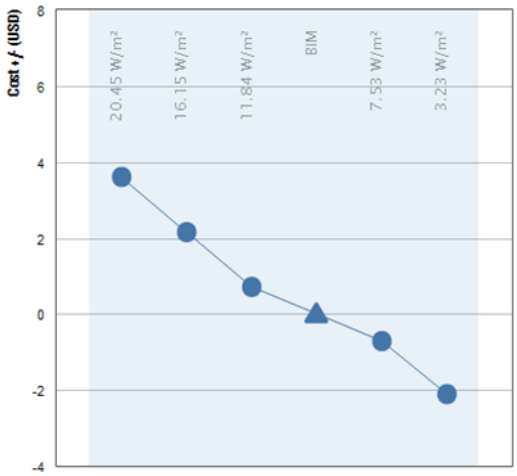
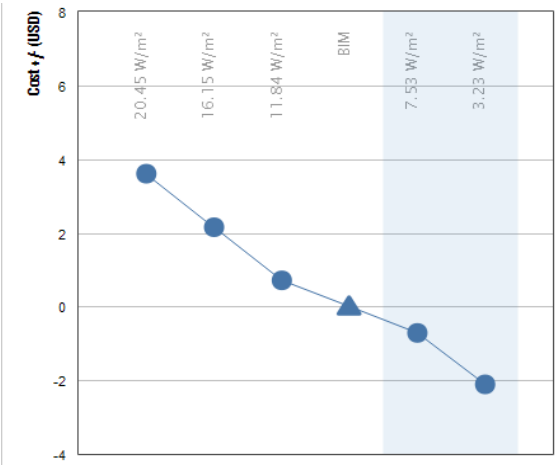



Using the space of skylight between the apartments as well as the roof and add entertainment, recreational and sports activities that serve the users and reduce the severity of isolation.

Places for sitting , for exercises , others for reading and practicing various activities have been allocated using simple materials that can be sterilized and are distinguished by the fact that they do not transmit viruses.

4. Using energy reduction methods

Making wider windows, adding Terraces,and using some façade treatments as the wooden cladding to reduce heat gain , increase day light , connect with out door and have a good view.

Before optimizing the energy consumption	After optimizing the energy consumption
The day light before the modification 	**The day light after modification** 
	
The day lighting and occupancy control before modification 	**The day lighting and occupancy control after modification** 
The lighting efficiency before modification 	**The lighting efficiency after modification** 

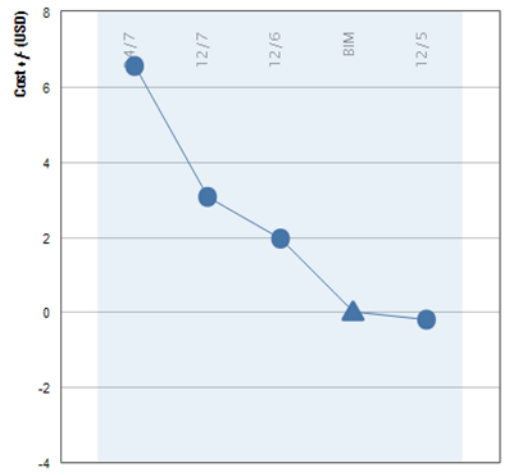
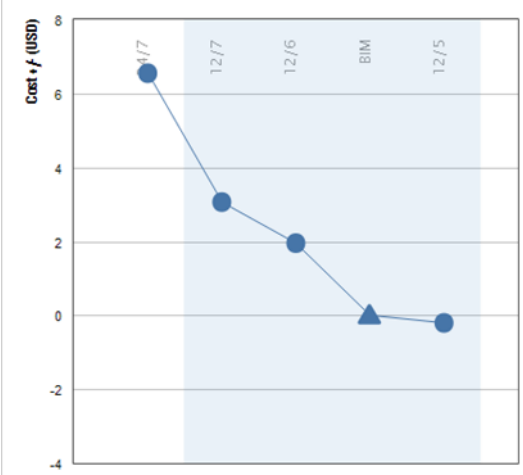
Operating schedule before modification	Operating schedule after modification
	
5. Allocate spaces for isolation	
Spaces are characterized by having more privacy through allocating spaces for isolation in the dwelling which are: - Room for the inficted person which is semi isolated from the dwelling. - Privite toilet inside the isolated room to be used by the isolated person only to reduce the transmission of infection. - Waste duct is provided inside the private toilet to get rid of the wastes directly outside the dwelling. - Private terraces for recreation during the isolation period.	
6. Used Materials	
In terms of the building and finishing materials, wood and stone have proven their ability of Relatively Infection transmission, and the two researchers suggest using them in furniture, stairs railings, door handles, windows, etc…	  

Table III. Methods and Modern technologies that are used in the treated current housing (social housing) to combat the Corona pandemic

5.5 Proof of the Research Hypothesis:

The two researchers proved that the Corona pandemic has a negative impact on the health, environmental, social and economic effects of the current housing (the governmental social housing that represents a large segment of society: the case of study) as well as lacking the

basics of housing, in order for them to be treated it is preferable to refer to the principles of Arab housing in its vocabulary and architectural treatment in addition to the use of technologies and modern methods of reaching treated housing that combat the Corona pandemic and achieve the basics of housing, as in (Figure 11).

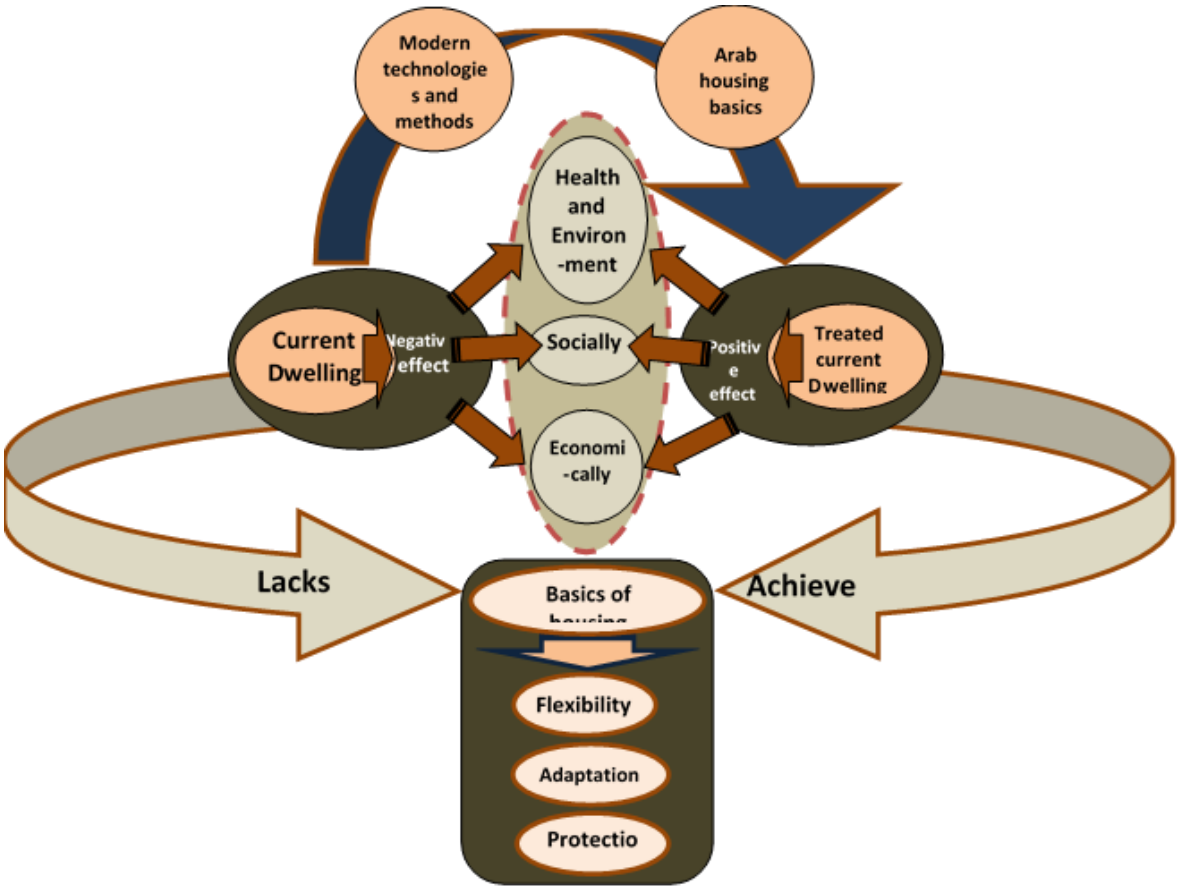


Figure 11. Proving the hypothesis for treating the current dwelling to face harsh isolation because of corona pandemic.

6. Suggested model of a checklist for addressing current housing to resist the impacts of the Corona pandemic

Suggested model of a checklist for addressing current housing to resist the impacts of the Corona pandemic						
country Name	State name (city)	The location of the dwelling	Coordinates Site Survey	No.	E (m)	N (m)
				1	.....	.....
				2	.....	.....
				3	.....	.....
				4	.....	.....
.....		Total points achieved		Weak resistance	Medium resistance	More resistant
15 points		Total score		Less than (7) points	From (8-11) points	More than (11) points
				Available	Not available	Points
1	**Dwelling site selection studies**	Good Ventilation				
		Suitable Solar Radiation				
		Suitable Orientation				

2	**Design Flexibility and Multi spaces**	The ability to open and close two spaces			
		Ability to customize isolation area			
		Flexible furniture elements			
3	**Energy reduction methods**	Openings are suitable			
		Suitable Finishing materials			
		Adding terrace possibility			
4	**Recreational spaces**	Exploitation of Roofs			
		Utilization of skylights between the units			
		Suitable terrace area			
5	**Modern farming systems**	Growing plants inside the dwelling spaces			
		Growing plants in terraces and skylights			
		Growing plants in roofs			

Table IV. Suggested model of a checklist for addressing current housing to resist the impacts of the Corona pandemic

7. Findings:

- Dwelling isolation resulting from the outbreak of the Coronavirus revealed the health, psychological and social negatives of the social housing model (case study).
- The principles and vocabularies of the old Arab dwelling were able to find great solutions to most health, psychological and social problems resulting from domestic isolation.
-Devising modern and advanced methods from the vocabulary of the old Arab housing to apply them to the current social housing models to make them more flexible and adaptive to the emergent changes.
- Access to a scientific research methodology that has a positive impact on the effects of domestic isolation and long periods of time spent at home.
-The possibility of converting the social housing units (case study) from human stores to human apartments, taking into account the economic component and the cost to the simple citizen.
- Simple architectural modifications to social housing are meaningful and beneficial in the process of managing home isolation in case of infection.
- Adding some terraces, exploiting the spaces of common skylights, as well as transforming the roofs of units from unused places into a social and entertainment forum that have a psychological and environmental impact on the simple citizen considering the Corona pandemic.

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