

Building and Planning Regulations in Makkah: The Case of Hilly Land

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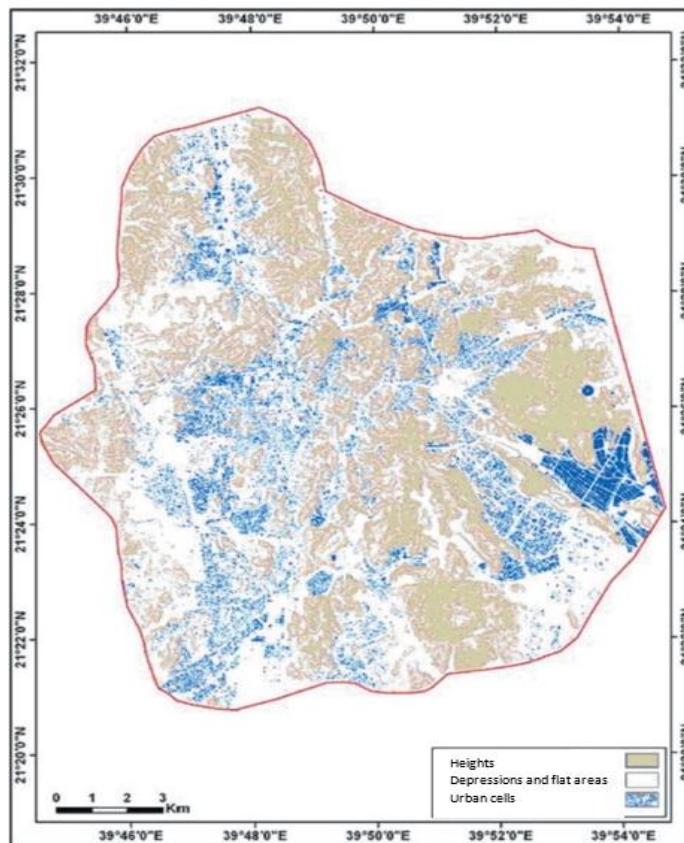
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INTRODUCTION:

The holy city of Makkah is not like any city in the world, but it is the city of Muslims in all parts of the earth and there is the Holy Mosque of Makkah. Its population is 1,578,722. During the Hajj season, Muslims come from everywhere in the world to perform Hajj and their number may reach three million pilgrims. So here the problem lies in the fact that the geographical nature of the city of Makkah in its mountainous nature, which limits the inability to expand the Holy Mosque of Makkah and the inability to build hotels to accommodate these huge numbers of pilgrims and Omara visitors.

Mountainous nature limits the holy Makkah Municipality in terms of the expansion of the main roads and the diversity of public transportation, therefore we must as a planner interest in this city and find solutions that are in line and fit the nature of the city and keep up with the vision of the Kingdom of Saudi Arabia in 2030, targets the number of pilgrims to 30 million people annually. Therefore, every available area close to the Holy Mosque of Makkah must be used to provide the largest possible number of spaces to accommodate this number of pilgrims. The topographical problem around the Holy Mosque has made it difficult for traffic to buses and cars transporting pilgrims. Therefore, this problem gives the government a few options for developing the Haram area, because the nature of the city prevails over the mountains, which led to an increase in informal and irregular neighborhoods, which greatly affected the city's infrastructure and made it difficult for the government to provide all the services that serve the citizen.

(Figure 1) Highlands and flat areas in the city of Makkah
(Al-Shehri, 2013) Based on data from the Makkah Al-Mukarramah Development Authority (1425 AH)



The main purpose of this article is to examine how building and planning regulation and laws in the flat areas may be different from the building regulation and laws of the news in mountainous areas, especially if they are holy cities such as Makkah Al-Mukarramah city, and building Regulation and laws in these holy cities may differ from other cities because these cities have their requirements and also have special goals.

LITERATURE REVIEW:

Despite the great influence of civilized man on its natural aspects, and the technical development in research methods, there is a severe dearth in the natural studies of the study area, and the following is an explanation of some of these studies:

Meraj Mirza (1984 AD) linked the surface manifestations of the city of Makkah Al-Mukarramah with urban growth and pointed to the relationship between many terrain factors and urban expansion and its directions, so he concluded that the terrain appears to control the urban expansion and its directions, so that the area surrounding the Holy Mosque of Mecca was spilled out from outside. Until the mountain tunnels were built and the mountains cut to extend the road network, it gave a huge boost to urban expansion outside the Haram area.

Mustafa Abdel-Baqi (1986 AD) studied urban growth in the holy city of Makkah Al-Mukarramah, where he traced the history of this growth from the beginning of Islam until the early 1980s. In one aspect of his research, he focused on the impact of the topographical factor on the formation of the urban growth of the city, where he stated that the city of Makkah Al-Mukarramah is distinct from other mountain cities by exploiting its rugged slopes that are not suitable for construction or housing, and whose slope rate may exceed 45 degrees.

THE GEOGRAPHY OF MAKKAH:

Makkah Al-Mukarramah is located at the intersection of latitude 25/21 north, and length 39/39 north. This site is considered one of the most difficult geological formations. Most of its rocks are granitic, very hard, and its height above the sea reaches more than three hundred meters. Makkah al-Mukarramah rises from the surface of the sea (330) meters, its area exceeds (1200) square kilometers, and its population exceeds (1,578,722) people doubling in the days of seasons, especially during the Hajj season.

Mountainous regions have a very diverse nature in topography, even in the same location, which prevents the creation of uniform criteria applied to how land uses are distributed. Therefore, there should be high flexibility in the method of distributing and signing residential areas, services, road networks, pedestrian traffic, and open areas. Where he notes that each mountain site is often unique and different from the rest, which results in various plans.

DEFINING PLANNING LAWS AND REGULATIONS:

Planning laws are a set of different and common terms that fall under this title, including spatial planning, city planning, land use, urban and regional planning, development monitoring. All these terms refer to one or more laws that fall under the name planning laws, to enable the government to control and control urban development through building and housing permits.

DEALING WITH MOUNTAINOUS AREAS:

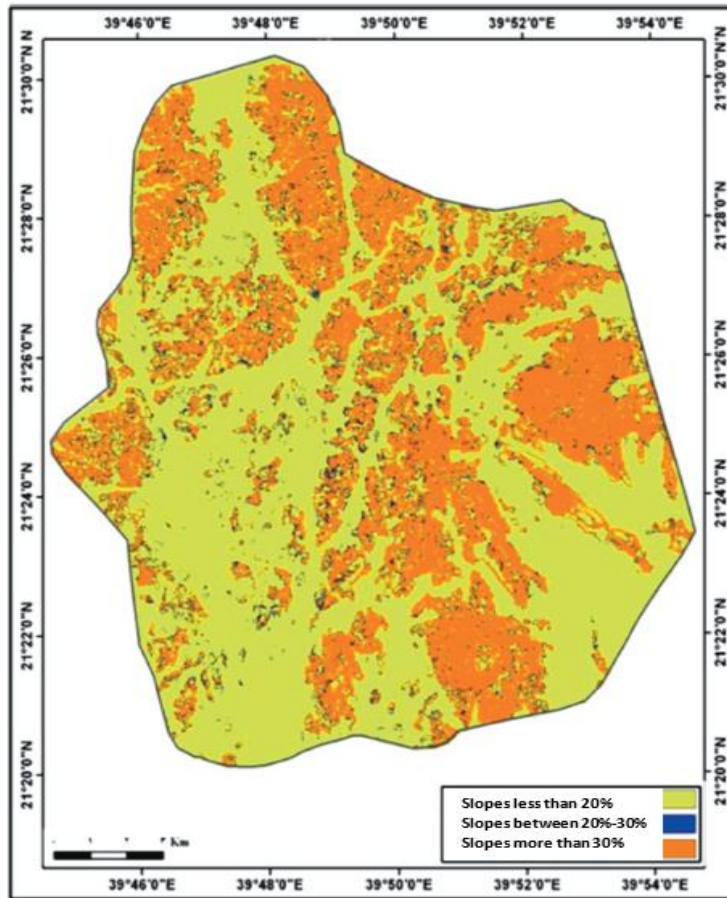
In view of the great diversity in levels of mountainous areas, it is sometimes difficult to obtain sufficient areas for the formation of residential neighborhoods, their subdivisions, the distribution of their services, and the listing of their methods according to the accepted standards, which are best dealt with as follows: determine all possible areas and areas of risk in the event the scheme is applied to nature and how to deal with it schematically, neutralize it and contain its seriousness, flexibility in the degree of street straightness and acceptance of the nature of mountain slopes and topographic levels, which are often curved, accept the diversity of residential neighborhoods in terms of size and shape, which is often imposed by the topography of the site, respecting the sharp and rugged natural areas of mountains and valleys, not covering land divisions and absorbing them as aesthetic, natural and entertaining areas, flexibility with the graduation of roads and dealing with that as the site requires. The percentage of acceptable inclinations is considered a schematic of roads %20 for the movement of vehicles and not more than 12% in pedestrian paths, Possibility of creating residential pockets or neighborhoods that may not rise to be alive due to the small areas, Allow construction of housing units on smaller lands than is acceptable in desert areas, flexibility in opportunities to find gardens, where you can use the available nature of mountains, forests, and others, exploiting the picturesque nature to provide a higher percentage of open and entertaining areas and natural parks. The difficulty in transporting construction materials and the different topographic levels reduces the importance of adhering to equal heights of residential units, Decrease in the general density due to the possibility of natural areas with a structure that is not amenable to construction, in addition to the difficulty of constructing multistory apartment buildings except in specific areas that are capable, Containment and belonging by considering the human scale in designing urban spaces. The general composition of the urban fabric is compatible with the terrain characteristics of the mountainous region, environmental integration with the natural characteristics of mountainous areas through the mixing of open spaces and building blocks, preserving the nature of the spatial diversity in the flats and contents, which is reflected in the diversity of dealing with each site with privacy.

MOUNTAIN AREAS STANDARDS:

In China, there are two kinds of settlement it is called primary and secondary settlement. The primary settlement has a slope range of 1-10 degrees, and the secondary settlement has a slope range of 1–26 degrees. Primary and secondary settled settlements are concentrated in the gentle slope area of about 10 degrees. (Zhengxu Zhou, 2018)

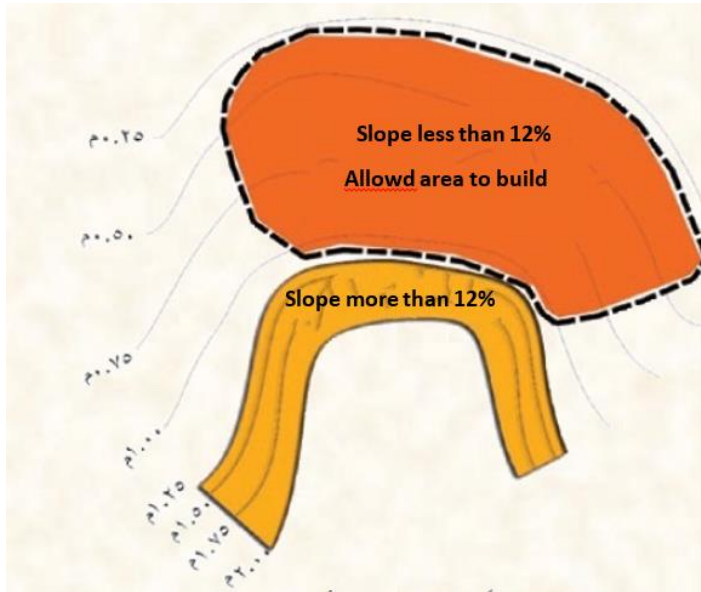
The Ministry of Municipal and Rural Affairs realized the role of the regression factor, stipulating that the degree of inclination in the residential uses of mountain areas does not exceed 20%, and the Holy Capital Municipality has established another possibility for construction up to a degree of inclination of 30% as a maximum for other uses not related to housing (MOMRA, 2006) and this determination from the MOMRA is an acknowledgment of the control of the topographical factor represented in the regression. Norah Al-Shehri (2013 AD) also concluded that 66% of the city of Makkah Al-Mukarramah has its slopes that is 150.30 square kilometers.

(Figure 2) Spaces of the urban fabric
(Al-Shehri, 2013), based on data from King Abdulaziz City for Science and Technology (2011 AD)
Dem data for the city of Makkah Al-Mukarramah, the Center for Geographic Information Systems
King Abdulaziz City for Science and Technology, Riyadh



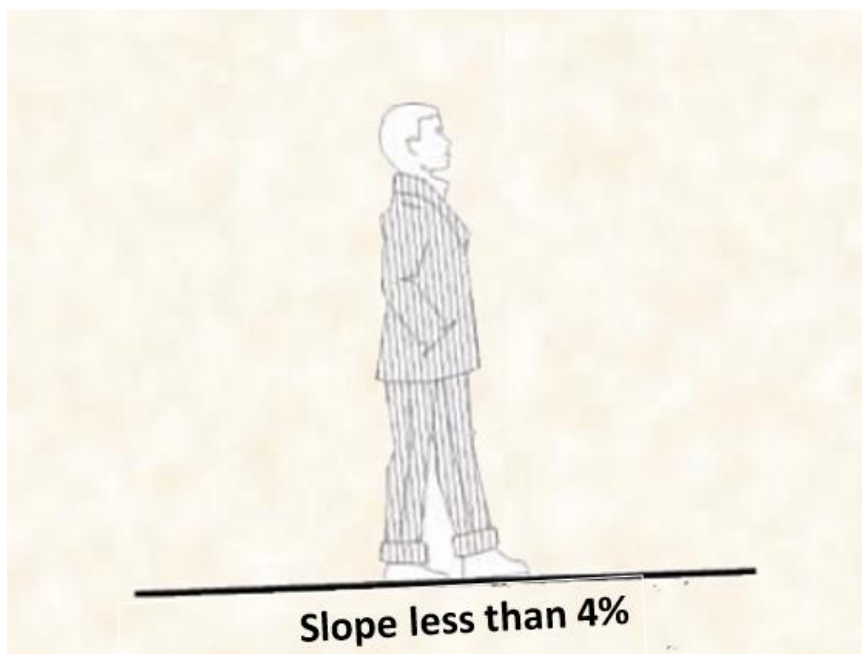
Areas with a severe inclination not suitable for building the center's buildings should be avoided, therefore the site should not be suggested in areas with a slope greater than 12% as shown (Figure 3).

(Figure 3) Zones with permissible inclinations and not allowed to build

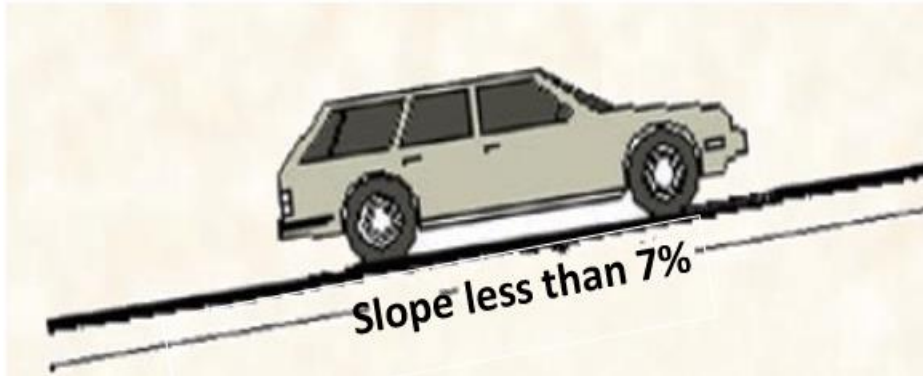


The site should not be placed in torrential streams. The site should be in levels that allow the water of the network to reach it, that is, in a site that allows the water pumped by the network to reach it. The terrain should allow the site to be easily accessed on foot or by car, so pedestrian paths should tend to not exceed 4% and motorways tendencies are more than 7% as shown in the two figures (Figure 4) (Figure5). The site should serve a good road network from all sides, any road for transit should not cross it, and it should be linked to neighborhood and city services.

(Figure 4) The allowed slope of footpaths



(Figure 5) The allowed slope of the motorway



STEPS TO DESIGN MOUNTAIN AREAS:

It should be taken into account that the most important design criteria, namely: (ease of access, privacy, safety), which we have missed in mountainous neighborhoods, despite the great need for them, and in the basic stages of land division two main paragraphs were the reason for a negative reflection on the appropriateness of the residential environment and the cost of its development, namely connect the land to be designed with neighboring neighborhoods and main roads and allocating 33% of the land area to roads and open areas.

Through the foregoing, we find that the methodology of dividing the lands has neglected many of the basic elements of land divisions, the foremost of which is the study of the site from the environmental aspects in its two parts to determine the areas suitable for development, determine the proportion of the built block of the neighborhood, the appropriate orientation of housing and determine the appropriate paths for roads and paths, and determine sites Suitable for facilities and services.

There are four important steps when designing residential neighborhoods and must be taken into account when developing planning systems. First, determine the appropriate areas for development, and leave the areas that must be preserved in their natural state based on the topographic and environmental analysis of the land. Second, the signature of housing units on areas suitable for development. Third, installing roads, connecting them to housing, and connecting them to the main hubs in the region, which are considered one of the most difficult stages in mountainous areas. Forth, providing basic facilities and services in place so that the neighborhood is suitable for use.

THE CONSEQUENCES OF MOUNTAINOUS AREAS:

In mountainous areas, the costs of asphaltting and street lighting are very high compared to the flat areas, and there are also difficulties in leveling the site and constructing the infrastructure of steep roads and the difficulty of accessing equipment to the site, and the difficulty of extending the services that the citizen may be deprived of in these locations, and of course the situation will be very expensive. The citizen, upon implementation, where he needs to cut the rock works, establish the leveling houses, retaining walls and the effort in obtaining building materials and the difficulty of providing water and getting rid of wastewater, which results in the construction of large water tanks and sewage tanks, all of this Tikka In an additional increase mostly on the value of getting a snapshot of land in the best residential plots in the city. This may in most cases lead the citizen to leave these lands without development and deprive them of their right to own housing suitable for their family.

CONCLUSIONS:

The research concludes the methodology of the land subdivision for the residential areas, need to be modified to achieve environmental suitability and to benefit from the optimal method of dividing the land, which depends entirely on the analytical study of the land, to reach. There is a need to empirically assess the suitability of land for development, building orientation, determine the paths of roads, and lanes and providing facilities and services in appropriate locations. The research concluded that the design criteria must be fulfilled the most important of which are privacy, accessibility, identity, safety, and finally clarity.

RESOURCES

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