The Effects Of Climate On Building Conservation

By

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CHAPTER 4: DISCUSSION AND FINDINGS

The findings of the research suggested that climate change refers to a change in regional or global patterns of climate, in general, an apparent change from the mid to late 20th century and recongnized as enormous to the increase in levels of carbon dioxide which is produced by the fossil fuels.

The planet is now observing the challenge of global warming, which is a main problem intimidating all living things in the world (Sgro, et.al, 2011). The rise in the temperature around the globe results in several impacts of environment, such as decrease in the amount of sea ice near continent, change of the ecosystem and rise of sea level. Global warming refers to the effect of the climatic effects on human which build up effcts of greenhouse by emitting greenhouse gas (GHG). 60 percent of the world's GHG was emitted in the energy sector, and about 17 percent of the GHG emissions were emitted from commercial and residential buildings in 2005. Climate change is expected to have non-trivial impacts on the buildings energy system through decreased heating and increased cooling (Oldewurtel, et.al, 2010).

The impacts on heating and cooling may be pronounced for the U.S. buildings sector because they currently account for a large share of buildings final energy demand 49% of final energy in residential buildings and 44% in commercial buildings, although these percentages will probably decrease with increasing demand for other services in buildings (Perez, et.al, 2010). Improved understanding of changing climate impacts would help regulators and local utility planners develop better investment strategies that ensure reliable and efficient energy supplies to their service territories. Particular importance will be timely up scaling of power generation capacity in accordance with increasing cooling demand (Santamouris, et.al, 2013).

As climate changing, predictors predict warmer winters and hotter summers in the upcoming100 years, design of new buildings and existing building designs will have to cope with the upcoming climate of future. The aim for designers of building supposed to provide buildings with comfortable environments for occupants without using extreme cooling or heating energy, which will worsen emissions of carbon dioxide (Morrissey & Horne, 2011).

A challenge in capturing the effect of climate change on buildings energy demands is that the impact occurs against the backdrop of socioeconomic and technological changes, which could amplify or moderate the net impact of climate change. Thus, an approach that integrates these various forces is advantageous for climate impact assessments in the buildings sector (Maiorano, et.al, 2013).

Although total energy use is important, the distributional effects on fuels may be more important for long-term infrastructure planning, for example, electricity generation, transmission, and distribution infrastructure. Electricity use in most U.S. regions increases with climate change due to the universal increases in cooling requirements and the predominance of electricity in cooling. However, the increase varies greatly across regions, again based both on the scale of the associated buildings sector and the precise regional climatic effect. The decrease in other fuels is larger than increases in electricity. Although this is partially due to differences in heating and cooling efficiencies, it is also influenced by the climatic effect as well as the degree to which heating is provided from electricity versus other fuels.

May standards that are related to use of energy have been made in the last decade to ensure climate change affects on building conservations. However, these standards are mainly focused on newly build buildings and ignoring the most of the parts of already existing buildings that will be required same challenges of improvements in the future. Therefore, it is urgency for the latest standards to encourage fair practice instructions that incorporate cost effective and appropriate technology advancements (Yang & Lam, 2013).

Challenges of Climate Change

Change in climatic situation faces several challenges, specifically how the humans will adapt these changes. The major cause for the globally increasing temperature is the increase in greenhouses gases emissions into the surroundings as fossil fuels are burned to provide energy with humanity. Despite of power stations and transport, buildings are accountable for most of the US's emissions of CO_2 and previous findings expose that this can increase in the near future. With a strong design, buildings can add to minimize an energy demand and the situation that can be mitigated. In the report of IPCC (Intergovernmental Panel on Climate Change) Fourth Assessment Report, it was revealed that the sector of buildings has the high potential of mitigation savings as a result of change of climate. The report suggested that most of the required technology to attain these potential saving that currently exists, and it is a situation of the implementation of strategies and technologies rather than depending on new interventions and technologies (Kavgic, et.al, 2010).

Effects of Acid Rain on Buildings

It is found that the due to the decrease in emissions, there is no clear proof found that cleaner air is an evident a decrease in conservation of buildings. Buildings that have withstood a large number of years of weathering have in the most recent 25 years started to disintegrate quickly. This can be attributed to the continuous change of stone surfaces, a methodology whereby the surface which is exposed of limestone breaks down away as rainfall washes away the sulfated layers.

It is just in the most recent decade or somewhere in the past that endeavors have been made to evaluate the measure of harm that has been brought about to materials as a consequence of decompositions of acid. It is recently identified that the spatial concentrations of acid rain pollutants and their transport mechanisms understood for accurate estimation of the damage that may occur during the construction of buildings.

The collaborations in the center of materials and contaminations are exceptionally unpredictable and numerous variables are included. Toxins on surfaces rely upon climatic centralizations of the poisons and the atmosphere and small scale atmosphere around the surface. Once the poisons are observed at first glance, cooperation will fluctuate relying upon the measure at initial surface, the reactivity of distinctive materials and the measure of humidity is present. The last component is very critical in light of the fact that the SO_2 that falls as dry indication is oxidized to sulfuric acid in the surrounding area of humidity at initial stage of construction.

The impacts of corrosive affidavit on current buildings are impressively less harming than the consequences for antiquated landmarks. Limestone and calcareous stones which are utilized as a part of most legacy buildings are the most powerless against erosion and need proceeded with redesign.

Examples of effects of acidic rain on buildings can be seen around the globe such as world renowned structures as the Taj Mahal, Cologne Cathedral, Notre Dame, the Colosseum and Westminster Abbey.

Effects of Limestone on Building Conservation

It was found that Magnesium limestone is a most fundaments component of construction used in many historical buildings that endures attack of environmental pollutants constantly particularly by sulfur oxides via acidic rain, particulate matter gaseous SO_2 and sulfate emissions.

It was also found that limestone is viewed as the most powerless of building stones to salt rot however; all remarkable stone work is conceivably at danger relying upon the level of salt contaminating and on the several variables that work in combination with salts to bring about weathering and decomposition.

The discoloration complex patterns are frequently seen on the stone building surfaces in urban surroundings. These patterns imitate connections between atmospheric pollutants, the stone layers of surface and rain which is wind-driven that can erode the surface. The rain during a storm is one of the major fundamental elements in shaping the rain amount which are delivered to the walls of buildings. Preferably, the correlation have to be plot for a sole location beneath steady direction of wind, speed of wind and rainfall concentration, but this is not reasonable due to the inadequate data sets. Total rainfall is a positive sign of the comparative value of wind-driven rain on surfaces of building.

Limestone is characteristically defenseless on the grounds that they contain calcium carbonate. In the outer environment acidic mixes separate little amounts of carbonates changing over them to sulfates, the most well-known salts found in stone work. Lime mortars and mortars, calcareous sandstones and different materials containing calcium carbonate are similarly powerless. For newly constructed buildings, there are some possible solutions of reducing building materials into silane-based creations before construction. For already existing building, there are different strategies that need to be considered to control the effects of limestone on building conservation.

Buildings and Sustainability

The main objective of the buildings is to protect its occupants from the hazardous elements. Major efforts have focused on improving the aspects necessary to carry out this objective, that is, an improvement in the overall quality of the building and in the domain of the costs (Hansen, et.al, 2010).

Currently the concept of sustainable development introduces an additional restriction, which is to fulfill the main goal of the buildings without compromising the ability of future generations to meet their needs. The building along with the construction and demolition causes a lot of environmental impacts arising from economic activity. They cause a great impact on the global environment through energy used to provide the necessary buildings and energy services contained in the materials used in construction. Buildings are responsible for about 50% of energy used and emissions of CO_2 into the atmosphere. The indoor environment has a major impact on health and comfort. Other aspects include the thinning of the ozone layer as a result of the massive use of chemicals, such as chlorofluorocarbons (CFCs), hydro chlorofluorocarbons (HCFCs), commonly used as refrigerants (Engle & Lemos, 2010).

Mechanism of Energy Consumption in Buildings

In a building, the energy is consumed in various ways, but mainly in heating, cooling and lighting. As per consumption of the above mentioned factors, the first place is occupied by the air conditioning of environments. Lighting is important but only in office buildings. Household appliances such as washing machines, refrigerators, etc., also have low consumption. A place deserves the television by the large number of operating hours. It is common to have the TV switch on for 8 hours, with a consumption equivalent to 4 hours of ironing. Widespread in nature is to circulate energy from the hottest to the coldest places. In this case De Wilde & Coley (2012) say that there is a flow of heat. A room is cooled if the external environment is colder and heated if the external temperature is higher (De Wilde & Coley, 2012).

Heat Flows from Higher Temperature Sites to Lower Temperature

The energy contained in a warm place that is cooling, people loose in three ways. First, the hot material in contact with colder materials pass heats them so that the hot material cools. This is a phenomenon of contact, where the materials need to touch for that to happen (Castleton, et.al, 2010).

The speed at which a material loses heat, depending on their conductivity, a property that has every particular material. There are materials that conduct heat more than other materials. Metals are much more thermally conductive than the materials of construction.

When a surface is hot, the air in contact with it is heated by conduction, as explained above. But as the air has the ability to move and rise, this warm layer in contact with the wall is clear and the heat is carried to cool places where it contact with air cooler and will cause the heat to cool and it start a process of air convection . Hot air contact is in this way, the natural convective cooling of a wall, ceiling or other occurring elements (Burke, et.al, 2011).

Another type of convective cooling is that where forced air flows over hot material. It is the forced convection, which circulate air moves and more energy faster than the natural process. When the wind blows over a surface, the mass of air passing over takes the heat from the surface, as long as it is warmer than the air. On the other hand, the air is cooled and heated surface. A sun roof is heated by receiving sunlight and cooled by circulating air around it (Maiorano, et.al, 2013).

The third process of energy transport distance is by radiation. Sunlight comes from far away; between the sun and the earth there is no matter that serve as means of transport, as in the two processes described above. It is that sunlight that has an electromagnetic wave that can travel in a vacuum and makes it at high speed, that of light. People can check that everybody emits waves and these waves carry a certain amount of energy. It is what is known as irradiation. The hotter a body is able to radiate energy. If the temperature is high enough, like the sun then irradiated waves can be called as light. All bodies on earth's surface emit or radiate waves called infrared. There are several types of infrared waves, depending on the power and carrying amount of energy and body temperature that emits infrared heating, such as common plates that are on the walls, emit a powerful infrared comes from a source of high temperature (Yang & Lam, 2013).

Solar energy therefore is a kind of energy transported by radiation from the sun. Radiation waves can be absorbed, the more strongly through the darker or black is close to the surface. Nobody would ever walk wearing black clothes in the sunlight of summers. For a summer day, it is best to walk in the sunlight is possible when an individual wear white/ lighter clothes. There are other highly reflective colors of the sun, as silver and gold (Kavgic, et.al, 2010).

Light colors are good for warmer climates. The darker color absorbs more sun's energy. This also applies to the energy from infrared radiation besides the colors, elements that absorb light or certain types of radiation. Glass is extremely has curious behavior because it does not allow sunlight to enter but not to the infrared. Consequently, an effect throughout window characterized by the passage of light and I no passage for infrared. It prevents the glass as well, the emission of heat from walls and floors from out of the window through the glass. If the room is heated because of sun, it cannot be cooled by radiation from the inside out while the window remains closed (Hansen, et.al, 2010).

Another well known fact is that of the cars placed in the sun. This situation causes an upset over then returning the car; the unsuspecting driver usually cannot touch the car without burning, steering wheel and cannot sit. The sunlight absorbs into the seats and body and could not be forwarded to cool the car, because the windows are closed and prevents the passage of infrared. In addition, the glasses also prevent the passage of wind; thereby cooling by forced convection does not occur. The whole process is known as greenhouse effect (Engle & Lemos, 2010).

In addition to absorb sunlight and infrared radiation, the materials have another property to store heat. People perfectly well that in every home or building an energy charge occurs during the hours when the sun penetrates through windows or projected on the walls. That energy, accumulate during daylight hours, that is radiated into the house and out during the sunset.

Walls And Insulation

Heat loss through the building material is significant loss because from the materials through which the construction process is carried out waste lots of light energy. The extreme case is that the houses which are constructed through tin consume lots of light so that heat losses are much higher through the houses constructed by tin material. In terms of consumption of light energy, these homes use excessive amount of light energy.

Building materials such as brick and concrete are good elements for retaining energy in the room, provided they have an adequate thickness. The outer walls constructed usually with very little thickness such as 10 to 15 centimeters, inevitably cause great fuel consumption. The most common a wall thickness is about 30 cm. This wall has good conductivity values, even as they become more expensive fuel it is also the cause for reduction of loses, for which they have to resort to apply some tricks (De Wilde & Coley, 2012).

Houses walls are usually made thick of 45 cm or more. Currently, to build such a wall has a very high cost. But it can be constructed through insulators, low conductive elements so that it can lower losses and can have reasonable cost of construction.

Insulators use air enclosed in small cells to avoid the passage of heat. Air is a poor conductor of heat. Insulators, by having hundreds of tiny air bubbles trapped in them, increase and magnify the effect of nonconductive air. Thus, a wall with air chamber has low energy consumption. In an insulated wall it is not necessary to bring the insulation thickness at a very high value to lower the heat losses. A wall of 30 cm can be divided from the middle with a 5 cm chamber insulator. If people take a 10 cm insulator additionally, people can reduce losses by 25% (Castleton, et.al, 2010).

The insulation is particularly important in the ceilings, as this area of the buildings is strongly subjected to the action of the sun and wind. In Argentina, as it progresses towards southward, greater amount of thickness of insulation must be placed on walls and ceilings. In hot regions, the insulation is also important to avoid overheating of the rooms walls and ceilings exposed to the sun (Burke, et.al, 2011). The main types of insulation are: glass wool, rigid foam, mineral wool and other which are placed at the site. It is true that only the use of insulator is one of the best ways to lower fuel consumption.

In all cases of placement of insulator, special care should be taken with the phenomenon of condensation, which occurs whenever there is humid air exist within the housing in contact with a cold surface. The insulator can be placed on the outside of the walls or inside. In case of a home or building already which is already constructed, it is generally easier to locate insulator inside (Sgro, et.al, 2011).

However, since the thermal point of view in abroad is at optimal place and insulating effects are more pronounced. This is only possible when construction is rising in the society.

Buildings That Retain and Save Energy

Energy and saving conservation is the right way to divide the problem into two parts: existing buildings and the buildings which are proposed to construct. Saving energy in already constructed houses are much more difficult than in a building. Before the construction of a building people can organize its design, location and construction as per the present fee structure and rules by keeping in mind the waste management strategy (Santamouris, et.al, 2013).Therefore Santamouris (2013) argue the rules set by using them only to construct buildings and houses like location of the field, building orientation, indoor orientation and windows location.

If these rules are appreciated they can safe significant amount of energy. There are not many secrets but it is home which adapt the climate that surrounds and the surrounded geography. People can utilize natural provided elements in against or favor. If people use, might it can be used to safe energy. Generally, the buildings are alike around the globe, despite of the climatic situations. If people do not care about the climate, they spend heavy amount of money in air conditioning or heating to preserve comfort at an optimal level (Perez, et.al, 2010).

Location

The wind has directions, preferential seasonal blows most of the time from a certain direction. The wind will serve to remove undesirable heat accumulated in the environment. But for this, we orient windows so that in summer the wind crossing the room by blowing. In winter, the wind itself should be avoided by closing the windows. The sun is important between 9 and 15 hours in winter. Outside these times the amount of energy reaching is low, only 10% of the total. 90% is around noon; all obstacles, whether natural or artificial that can cover the sun during those hours, prevent arrives so appreciated and economical radiation. It will be necessary to study thoroughly the shadows cast by trees and adjacent buildings, to place new construction so far from them as possible. This is true for the winter (Morrissey & Horne, 2011).

For summer, a tree or plant to project shadow on a building or window can create the difference between comfort and discomfort. Clearly, temporary trees are ideal for this situation. The open spaces on land, who free the building, must be studied carefully because if they do not receive a lot of sun in winter, probably nobody uses them. A shaded terrace at this station is universally recognized as very unpleasant and cold. It has wasted the opportunity to have a sunny entertaining space (Maiorano, et.al, 2013).

The geographical representation of a building has a powerful impact on the wind and sun. In summers, the sea, for instance, starts in the noon and a cool breeze blows that can help to cool the room which is the result of burning sun. (Yang & Lam, 2013).

The Interior Spaces

A great way to reduce consumption of energy in a building is to consider the interior spaces distribution with the criteria of conservation. In huge buildings, such as offices, environmental distributions in large places without walls or partitions dividing small places established a collaborative environment of working, while the desk distribution, decorative plants and libraries, etc has been achieved with good taste and intelligence. The wider spaces does not create hindrances to the current and flow of air from the core centrally to the margin, thus ventilation facility, natural lights and heat circulation or cold from place to another side is necessary (Engle & Lemos, 2010).

The interior spaces distribution should have to put in the south, more energy consuming spaces that do not need cooling or heating, as in the case of elevators, bathrooms and core cleaning etc. The floor on the top is the one that suffers a lot of changes, because when showing its roof to wind and sun, variation in temperatures are significant. It is suitable then put on that site lifts halls and other spaces that do not need air conditioning. In home, the rooms that need a plenty amount of sun raises are the bedrooms and dining rooms. Washrooms can be constructed to the south region, to create a control chamber that prevents heat leakage from the front of the buildings. Small stores or warehouses and garages are also the spaces that can be constructed in south and can act as the losses protectors. Orientation of west can be dangerous in summer, as the evening establishes an area where a plenty amount of solar energy is established (De Wilde & Coley, 2012).

Windows

The windows are not only meant for the visual means of communication for the outside world and natural light which is needed for interior purposes, but become a significant part in the house heating system. The sun penetrates in an atmosphere that contributes to heat with a lot of energy without producing costs. At the same time; the windows are the sources through which energy goes out mainly at night (Castleton, et.al, 2010).

A sized and properly placed window is a natural energy-saving factor. Few elements can compete in efficient manner. On cloudy and rainy days, little solar energy reaches to the room through the windows. In such cases it is necessary to use a traditional heating system (Burke, et.al, 2011).

As the weather becomes mild, window surface can decrease necessarily. In temperate climates, there is some danger of overheating in the rooms, which can be avoided with properly sized ventilation.

Savings in Lighting

The lighting is necessary, since no one would doubt this statement. However, it is more common to find poorly lighted homes to well-lighted. From Sgro et.al, (2011) point of view economical light involves consuming electricity, which leads people to consider depending on whether day or night lighting. Economical daytime lighting is of course natural lighting. All lights on during daylight hours are a direct attack on budgets, whether it is a family or a business (Sgro, et.al, 2011).

If sunlight was invented many years ago and it works fine, why does everyone want to use possible artificial light in the environment? Natural lighting comes from the sun or the sky, which is a natural element of light diffuser. Given this rule is necessary to provide sufficient windows or openings in strategic locations. An opening to the north offers an excellent opportunity to control the lighting to make it useful, so people should use shades as horizontal elements and rectangular openings for regulation. The vertical windows are more suitable for the east and west. People should try to avoid the curtains, since they do not prevent the sun from the glass inside so that it controls infrared rays through glass (Morrissey & Horne, 2011).

High windows have better light distribution when they are placed wisely. Walls and ceilings can be used as light diffusers. The reflected light from windows on building elements and the light color of this lighting distributed in the environment, making it simple without making people amaze. The shape of the building is significant in the distribution of natural light and lighting needs. For the same surface, assuming correct light levels in the center of the building and on the perimeter, people come to the conclusion that multi-storey square shaped buildings conserve more energy (Maiorano, et.al, 2013).

The colors of the linings have great influence on the spread of natural lights, as if they are clear, they reflect light and cause its homogeneous distribution. Partially considered, natural lighting is better than artificial because with it lower power consumption is achieved, but analyzed the entire building, this is only true concept in according to one perspective. Natural lighting does not prevent the installation of the same power of artificial lighting, since not always has it? Only when the sun is present, the number of hours of artificial lighting is reduced (Yang & Lam, 2013).

By increasing the proportion of natural light, certainly it increases the number of windows where sunlight penetrates. In this case, it increases the chance of seepage through joints and heat loss through glass. This effect is more pronounced in the colder weather.

Effects of Climate Change

Because of potential effects on human health, economy and environment climatic change has been an extraordinary concern. Some imperative natural changes have been watched and connected to an Earth-wide temperature rise. Expanded worldwide temperature change permits an ecosystem; a few species may be constrained out of their living spaces (probability of eradication) in view of changes in conditions while others may spread, attacking other ecosystem (De Wilde & Coley, 2012).

On the other hand, climate change might likewise have beneficial outcomes, since temperature expands and expanding CO_2 fixations can improve the profitability of the ecosystem. Satellite perceptions demonstrate that the northern side of the equator expanded efficiency since 1982. On the other side is the way that the aggregate sum of biomass delivered is not so much good, since biodiversity can hush further lessen a little number of animal categories that is flourishing (Maiorano, et.al, 2013).

Prevention to Control Climate Change Effects through Technology

All are now aware of the growing threat of global climate change, but less well known is that the community of information and communication technologies (information and communication technology, ICT) can play a key role in overcoming the rising crisis. Climate Group Global Initiative on environmental sustainability (Global e-sustainability Initiative, GeSI) has recently published a report on this topic Smart 2020: Enabling the Low Carbon Economy in the Information Age. It argues that an increase in the efficiency of energy systems, ICT, as well as the use of these systems for the optimization of power networks, supply chains, intelligent transport systems and infrastructure construction could reduce by 15% the amount of greenhouse gas emissions (greenhouse gas, GHG), expected in the world by 2020. This would significantly contribute to the global goal of overall reduction of emissions of GHG (De Wilde & Coley, 2012).

By calling all under the banner of self-managed computing, people from IBM compared the IT-industry in the year 2001 with the telephone industry in the US in 1920. At that time, the rapid development of the telephone industry and the penetration of phones in everyday life has caused serious problem of lack of trained operators to work with manually operated switches. Analysts have predicted that by 1980 the ninth year to meet this need, half of the US population will be forced to work telephone operator (Santamouris, et.al, 2013).

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

Conclusion

The proposed study clearly explores the geographically varying nature of consumption of fuel changes that might take place from a climate change. Although the total energy requirements are an important result of the investigation, infrastructure is has to build to provide particular fuels, such as natural gas or electricity. Generally, the findings suggests that geographically heterogeneous variations in increases of electricity consumption can bring an effective decrease of heating oil natural gas consumption with an associated impacts on the nature of infrastructure planning. This geographical heterogeneity is mainly influenced by similar heterogeneity in effects of climate. However, it is also mainly dependent on heterogeneity in the building sector scale among states. An individual can perceive the scale of the building sector as a multiplier on the effects of changing climate.

The proposed study describes the strength for bias in models that operate at large regional scales to analyze and estimate buildings energy use. When the national U.S. model is run with the same driving assumptions as the 50-state model in this study, variations in energy and fuel demand can minimize over the century. Although the aggregated national model is incapable of capturing the details of interactions among socioeconomic development, climate policy, technological change, and climate change within its modeling of geographical domain, it can represent the general patterns of buildings energy consumption at the national level.

The enormity of global warming can be daunting and discouraging. What one person or even a nation can do on your own to slow or reverse climate change? But as the some recommendations made by ecologist Stephen Pacala and Robert Socolow the physical, both belongs to Princeton University, each recommendation is difficult but feasible and in certain combinations, capable of reducing emissions of greenhouse gases to safer levels. The style changes of personal life that a person can promote and can help reduce individual's carbon footprint. Not all of them apply to everyone. It is possible that people are already putting in some practice, or other may dislike these recommendations. But the adoption of some of them can make a difference of usage abandon fossil fuels. The first challenge is to eliminate the burning of coal, oil and ultimately natural gas. This is perhaps the most daunting challenge, as citizens of the richest countries factually eat, dress, work, play and even sleep with products of this fossil source. And citizens of developing countries want and supposedly deserve the same comforts that are due in large part to the energy stored in these fuels.

Oil is the lubricant of the global economy. The coal is the fundamental element, providing about half of the electricity used in the US. A percentage that is likely to grow, according to the International Energy Agency. There are no perfect solutions to reduce dependence on fossil fuels (e.g., neutral bio fuels on carbon can raise food prices and cause destruction of forests, and despite the nuclear energy it does not emit greenhouse gases and it produces radioactive waste), but all that it is achieved an account. The experience of the last twenty years has shown that is not easy to change the system of building construction and operation. To achieve a sustainable construction must break the routine and bad habits acquired by decades of waste of natural resources.

People must change the mindset of the industry and economic strategies in order to give priority to recycling to the traditional tendency of the extraction of natural materials. The use of construction and energy systems based on renewable energy products should be encouraged. It is in this environment where mankind is aware of the importance in the more obvious manner everyday; those environmental aspects have very important consequences on the main options of the construction process.

Recommendations

Recommendations to avoid effects of climate on building conservation are as follows:

- Upgrade the infrastructure - Buildings are globally acknowledged at the third level for greenhouse gases emission (43% only in US), despite the investment in greater isolation and other measures cost-benefit ratio for temperature control resulting in long-term economics. Individuals and society must have to upgrade their infrastructure to reduce the effects of climate on building conservations.
- Live closer to workplace - Transportation is the second main source for the cause of greenhouse gas emissions in the United States (burning a single liter gas produces more than 2 kg CO_2). One way to progressively reduce fuel requirements for transport is moving to live closer at workplace, use public transport, ride a bike or choose to walk or other ways in terms of transportation that does not require anything beyond human power.
- Consume less - The best way to reduce greenhouse gases emissions refers to buy lesser amount of things.
- Eat wisely- The maize crop in the United States requires barrels of oil for the necessary fertilizer and diesel to harvest and transport. And the meat, beef, chicken or pork, requires kilograms of feed to produce half a kilo of protein. Choose foods that balance nutrition, taste and ecological impact although it is not easy.
  - Stop Deforestation - Every year, 13 million hectares of forests are reduced. Only the wood extracted from the tropics accounts for 1.5 billion metric tons of carbon into the

atmosphere. This represents 20% of emissions of greenhouse gases of human origin, and a source that could be prevented relatively easily. Improved agricultural practices, along with paper recycling and forest management balancing the amount of timber with the number of new trees planted could quickly eliminate this significant portion of emissions.

By implementing the above mentioned recommendations people can minimize the effects of climate change on building conservation.

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