PROPERTY INSURANCE AND INNOVATIVE BUILDING TECHNIQUES - REDUCING THE CONSEQUENCES OF CLIMATE CHANGE

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A R T I C L E I N F O

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A B S T R A C T

Climate changes are recognized as a matter of global importance. They can have a long term monetary and non-monetary influence on the lives and prosperity of people. Almost all industries are affected by climate change, but insurance companies and the construction industry suffer particularly high pressure. Due to the unpredictability of climate changes and increased risk, the possibility of withdrawing insurance against natural disasters has been considered. From the construction industry, it is required to adapt to changes, by building less polluting buildings, resistant to destructive effects of climate changes. The insurance industry has recognized the direct connection between green - sustainable practices and reduced risk, which in recent years has been the reason, for becoming a leader in creating, energy and resource efficiency. The contribution of this paper is in the demonstration how innovative construction solution can contribute to sustainable insurance and reducing the consequences of climate change.

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Introduction

Climate changes are recognized as a matter of global importance, which effects can be observed on all continents. Continuous growth of average global temperatures leads to frequent and severe natural disasters, which are causing loss of lives and high financial losses due to the property damage. Almost all industries are affected by climate change, but insurance companies and the construction industry suffer particularly high pressure. Insurance is a measure that reduces risk and compensates for damages. The higher the risk is, the higher the insurance premium will be. But if the natural disasters continue to increase unpredictably, the property insurance could be withdrawn. Millions of Euros and dollars that the insurance industry had to compensate to the insured around the world and the uncertain future motivated the insurance industry to promote sustainable energy technologies. Although fighting climate change is considered to be a reduction of greenhouse gases, equal attention has been given to the possibility of adapting existing and building new buildings, so that they are more stable and more resistant to the natural disasters. Extreme climatic conditions are becoming a norm that the construction industry needs to adapt to by using renewable energy sources and investing in innovative building solutions. The aim of this adjustment is the construction of buildings that can withstand storm winds, floods, extremely low and high temperatures, earthquakes and fires, with no or minimal damage. The construction of such structures could be considered as a measure of prevention, which would provide accessible and sustainable insurance in the coming years. In this paper, an innovative way of constructing an object resistant to climate change has been shown - MC^2 construction system.

Methodology

With respect to the climate changes, sustainable insurance and innovative MC^2 construction system using relevant literature following methods were applied: induction deduction, synthesis, analysis of the content. In this respect, the research methodology aims to analyze how the innovative construction solution - MC2 construction system can contribute to sustainable insurance and reducing the consequences of climate change. Also, it covers the in-depth content analysis of available literature on this matter of national and foreign scholars. By using this methodology and practical methods described in this paper could provide affordable and sustainable insurance in the coming years, increase the quality of buildings and the well-being of people.

Results of research and discussion

Climate change

Climate change refers to the increase in average surface temperatures on Earth. The scientific consensus agrees that climate change is primarily a consequence of the human use of fossil fuels, which releases carbon dioxide, methane and other greenhouse gases in the air. These gases can absorb a spectrum of infrared light, preventing a part of the thermal radiation coming to the earth's surface, to be reflected and returned to

space, thus contributing to the warming of our atmosphere. Produced, these gases can remain "stuck" in the atmosphere for tens or hundreds of years. Climate change over the past 35 years has led to a rise in temperatures of about 1.1º C on Earth, resulting in melting of glaciers, an increase in ocean levels and the overflow of coastal areas (European Commission, 2017). Warm air can hold large amounts of water, due to higher evaporation rates, causing abundant rains and floods to become more frequent. With increasing global temperatures, a process such as desertification transforms formerly fertile areas into drought environments. Storm winds, floods, earthquakes, etc. resulted in a loss of human life and severe property damage. An overview of the natural disasters caused by the climate change as well as the damage they caused to the economy in the last thirteen years is given in Table 1.

Table 1. Natural disasters caused by climate change and the damage they caused to the economy

Year	NATURAL DISASTER					
2005	Hurricane "Katrina" in USA, 125 bil. $ damage					
2006	Cyclone "Larry" Australia 1.1 bil. $ damage					
2007	Floods: Mexico India 120 bil. $ damage			Wildfires USA 1.9 bil. $ damage		Drought USA
2008	Hurricane "Ike" USA 25 bil. $ damage & caused the increase in gas prices "Gustav" SAD 25 bil. $ damage		Typhoon on the Philippines	Cyclone "Nargis" Burma	Floods SAD 12% crops destroyed, prices of food were increased	Floods in China
2009	Hurricanes "Ida" USA, El Salvador, Mexico, Nicaragua 1.5 bil. $ damage	Typhoon "Morakot" Philippines Taiwan, China 1.7 bil .$ damage	Cyclone over Switzerland, Austria, Germany, Poland and Czech, 1.6 bil. $ damage	Numerous tornadoes in the USA from Feb. to Jun caused 5.7 bil. $ damage	Floods in India 2.2 bil. $ damage	Winter storm „Klaus" caused 5.1bil. $ damage in France Italy and Spain
2010	Floods in China 18 bil. $, in Pakistan 9.5 bil. $ damage			Earthquake in Chile 30 bil. $, Haiti earthquake & tsunami 8.5 bil. $ damage		
2011	Hurricane "Irena" in USA 20 bil. $ damage & 45 bil. $ damage in total to the economy		305 tornadoes in the USA, estimated 3 bil.$ damage	Flooding of Mississippi river in the USA caused 2 bil. $ damage	Earthquake in Japan & tsunami caused 300 bil. $ damage	The eruption of the volcano on Island caused 1.2 bil. $ loss to air traffic companies
2012	Hurricane "Sandy" in USA 50 bil. $ economy damage		Typhoon on the Philippines	Floods in China	Earthquake in Indonesia and Myanmar	Drought in the USA caused an increase in food prices

Year	NATURAL DISASTER				
2013	Typhoons, "Haiyan" in the Philippines, "Phallin" in India, "Ingrid" and "Manuel" in Mexico	Tornado "Oklahoma" in USA 2 bil. $ damage	Earthquake on Philippines and Solomon islands		
2014	"Hagupit" Philippines	Floods, in Serbia 2 bil. $, in India and Pakistan	Extremely cold weather in the USA		
2015	Floods in India 190 bil. $	Earthquake in Nepal destroyed over 900.000 buildings	The culmination of a six-year drought in California emptied underground reservoirs caused $2.7 billion damage and left 21.000 people without jobs.		
2016	Hurricane "Matthew" Caribbean 1.5 bil. $ damage	Typhoon "Lionrock" in the Philippines left thousands of people without homes	Floods in China left millions of people without homes	Earthquake in Italy and Ecuador	Australia extreme heat caused coral reef to fade
2017	Hurricanes: "Harvey" in USA 180 bil. $ and "Irma" 100 bil. $ damage			Floods in Bangladesh	Earthquake in Mexico
2018	Extremely cold weather, USA -38°C Russia -65°C				

Source: The international disaster database (EM-DAT)

Insurance of property as a measure of protection against consequences of climate change

Insurance is an effective measure which has a purpose of reducing the risk of unexpected financial losses caused by natural disasters. Purchasing an insurance policy for the insured may be useful especially since the budget, available to the Governments to compensate for damage are limited, and the effects of natural disasters are increasing over time. Natural disasters are events that turn into a natural catastrophe when their consequences cannot be easily compensated, such as loss of life or severe damage to the properties. Such accidents threaten humankind and stability of its economic system. They can lead to a long-lasting monetary and non-monetary influence on the lives and prosperity of people, especially in what is considered to be high-risk areas such as floodplains and coastal areas (Wolfgang, Ritzberger-Grünwald, 2019).

Climate change is the cause of many weather conditions such as hurricanes, typhoons, floods, fires that carry the destruction of entire cities as well as enormous material damage (Gizzi, Potenza, Zotta, 2016).

The insurance industry plays a double role in society: guarding society's assets and funding the economy. Its main task is to reduce the risk of financial uncertainty to a minimum. Insurance industry includes policy holders, (primary) insurers, reinsurers, brokers and the financial market.

Climate change is one of the leading risks which global insurance industry is facing. Extreme damage to property due to natural disasters caused by global warming made a lot of pressure on insurance companies that had to pay off the insured (Müller-Fürstenberger, Schumacher, 2015; Nicholson, 2019).

It is believed that 2017. was the most expensive year for the insurance industry since the cost of natural disasters was $337 billion (Swiss RE, Institute Sigma, 2018). Ignorance of climate change is the biggest threat to the socio-economic stability of our society (World Economic Forum, 2016, 2017).

Munich Re Reinsurance Company founded a research institution called the "Corporate Climate Center" (CCI) that studies climate change and its effects since 1974. CCI researchers reported that if measures are not taken to reduce CO2 emissions, the risk of natural disasters will become impossible to predict, and the property will become impossible to insure or the price of insurance will be become too high for most of the customers. The consequence of an inaccurate risk assessment of natural disasters is that the insurance companies could have unexpected losses. One can argue that this unpredictable trend has already started. In 2016, Munich Re (Reinsurance Department) spent 929 million euro, (Munich Re, 2017) to help restore damage to property caused by natural disasters. Munich Re also announced to shareholders that it would reduce its annual projected profit thanks to higher losses caused by hurricanes Harvey, Irma and Maria (Munich Re, 2017).

Therefore, the industry has taken an active role in the promotion of renewable energy sources and green construction by implementing green insurance products.

Green insurance products include reduced premiums and improved insurance coverage of buildings built to withstand extreme weather conditions; legal responsibility for pollution; special insurance for renewable energy projects (Savitz, Gavriletea, 2019). The insurance sector responds to the challenges of sustainability with strategic actions and through insurance and investment, including them in the principles of sustainable insurance supported by the United Nations (UN Environment, 2017).

Despite the high risk of natural disasters that comes with climate change and gloomy predictions that catastrophes in the future could intensify, the number of people that buy insurance against natural disasters is not significant (Starominski-Uehara, Keskitalo, 2016).

The reason is financial inability especially in poorer countries such as the Republic of Serbia and expectations that in the event of a disaster, the State will compensate for the damages. In addition to financial inability, people tend to purchase insurance only for the risks that they are most likely to be exposed to.

In the Republic of Serbia after floods in 2014, only 2.4% of people who suffered damage were insured and got compensation from insurance (Adamandios, 2015). Neither the economy nor the population was insured. Compensation and reparation are funded from the state budget, foreign funds, and loans but it didn't reach all the people affected by the floods...

So far a little attention was paid to the home building industry and the building codes that are influencing the construction and reconstruction of thousands homes per year. The change is introduced rather slowly (Riley, Cotrgave, 2018).

After the Paris Agreement in 2015., construction industry was pressured to start building energy efficient, less pollutant buildings but homes are still left vulnerable to the hurricanes, floods and the price of insurance policies continue to rise. In order to analyze the influence of climate change on the cost of homeowners insurance, in this paper, we have closely look at the United States of America as this state is spread through several climate zones, available data are up to date and its considered to be economically liberal market.

Table 2. Average premiums of insurance for homeowners, percent change and inflation rate per year

Year	Average Premiums For Homeowners $	Percent change	Inflation rate per year
2007	822	2.2%	2.8%
2008	830	1.0%	3.8%
2009	880	6.0%	-0.4%
2010	909	3.3%	1.6%
2011	979	7.7%	3.2%
2012	1,034	5.5%	2.1%
2013	1,096	6.0%	1.5%
2014	1,132	3.3%	1.6%
2015	1,173	3.6%	0.1%
2016	1,192	1.6%	1.3%

Source: Insurance Information Institute. Federal, Reserve bank of Minneapolis

From table 2. it can be seen that the increase in prices of insurance policies was direct consequences of weather related disasters caused by global warming and climate change.

Table 3. Average homeowners rates by states

State	National Average: $1.727	% difference	$ difference
Florida	$5.,207	200%	$3,471
Louisiana	$4,474	158%	$2,737
Oklahoma	$3,599	107%	$1,862
Alabama	$3,383	95%	$1,646
Arkansas	$3,040	75%	$1,303
Kansas	$2,606	50%	$870
Missouri	$2,392	38%	$655
South Dakota	$1,946	12%	$209
North Dakota	$1,850	7%	$114
Minnesota	$1,776	2%	$39
Iowa	$1,661	-4%	-$76
Indiana	$1,630	-6%	-$106

State	National Average: $1.727	% difference	$ difference
Michigan	$1,533	-12%	-$203
Wyoming	$1,412	-19%	-$325
Ohio	$1,186	-32%	-$551
New Jersey	$1,012	-42%	-$725
Oregon	$892	-49%	-$845
Utah	$879	-49%	-$858
Vermont	$816	-53%	-$920
Hawaii	$510	-71%	-$1,226

Source: Insurance Information Institute

Looking at the data presented in table 3. it can be seen that in Florida, which is commonly heavily hit with hurricanes and floods, insurance policy for homeowners is 200% higher than national average, while Idaho, Oregon and the states with continental climate pay 50% less then national average. It shows that difference is over six times in price over USA, mostly according to exposure to weather influences.

Influence of the climate change on the homeowners insurance also can be observed on the number of claims for damages. In total number of policies, 5,12% of homeowners are seeking for compensation is for damages. Almost 80% of total requests for compensation are for damages emerged from devastating effects of water and wind (Insurance Information Institute, 2018). The newest change in homeowners insurance is direct impact of the house framing, construction method and used materials on the price of insurance policy what shows the beginning of direct influence of construction and used materials in insurance policies prices, data are presented in table 4.

Table 4. Influence of the house framing on the insurance rates

Siding Type	Annual Rate	% Change vs Average
Frame	$1,365	1%
Brick/Masonry	$1,216	-10%
Masonry Veneer/Brick Veneer	$1,282	-5%
Log/Wood	$1,520	13%

Source: Insurance Information Institute

Data shown in table 4. are based on the analyses at four different framings of 250.000 homes in the states of Oregon, Texas and California.

More research is needed on this subject as well as proactive measures in promoting disaster resilient homes, stronger construction materials and new building techniques. The prices of insurance policies for houses are influenced with the risk they are likely to be exposed to, and by the price of house itself. Higher price of the house will lead to the higher insurance policy (Alzahrani, Boussabaine, Almarri, 2018).

Price of the house depends on the materials price and construction process costs which is directly connected with the speed of construction. The idea behind building disaster resilient homes should be use of resistant and durable materials while keeping construction process as simple and short as possible.

Climate factors as a cause of deterioration of construction materials

Construction materials components and constructions must fulfill many functional requirements throughout the entire life cycle of the building and must have adequate endurance especially concerning changing weather conditions (Ki Pyung, 2019). In practice, many building materials after a short period of use show signs of damage and deterioration resulting in high maintenance costs and damage due to weather conditions such as extreme temperatures, increase humidity, solar radiation, wind and other (Camilleri, Jaques & Isaacs, 2001). Individually and in combination, these factors affect building structures and materials, leading to their faster decay.

The temperature affects the decay of the material very gradually and in different ways. Changes in temperature lead to a thermal gradient between the surface and the inner layer of the material (especially in materials with lower thermal conductivity), which can lead to degradation of the mechanical properties of the material and the formation of fine cracks, causing loss of strength, the increase in material porosity, and the reduction in chemical resistance of the material. Climate change is causing extreme warm summers, but also extremely cold winters increased moisture and water damage due to increasingly frequent floods. Water is considered one of the critical elements in the decay of building materials.

Water may weaken the building structures when it is in constant contact with it and can affect the surface damage of the material. It is estimated that more than three-quarters of all registered damage to buildings and houses is caused by water (Moncmanová, 2007). Water damage includes the consequences of floods, roof leaking, rain… The leakage occurs due to physical damage to roofs and roof structures as well as from damage to construction materials caused by climatic influences. Moisture and high temperatures in combination affect chemical, biological and mechanical decomposition processes. Decaying the exterior walls made of porous materials is caused by high humidity in the air as well as exposure to long periods of rain. In most materials, the increase in relative humidity leads to the creation of conditions for the occurrence of the mold. Also, humidity promotes the decay of metals causing corrosion.

Solar radiation plays an essential role in photochemical reactions because the intensity of solar radiation at appropriate wavelengths is a critical condition in photochemical reactions that affect the degradation of various building materials. Of the total energy that strikes the earth, about 10% is ultraviolet radiation, 45% is visible light, and 45% is infrared (Moncmanová, 2007). Synthetic polymers such as plastics, but also natural polymeric materials such as wood, are widely used in construction where they are routinely exposed to sunlight. It is known that the UV-B spectrum of solar radiation

adversely affects the mechanical properties of these materials, limiting their lifetime and increasing maintenance costs. Only concrete and glass are utterly resistant to these influences.

Wind, strong wind promotes penetration of rainwater and aqueous solutions into porous materials. The wind also has a direct mechanical effect and leads to the destruction of roofs and sometimes entire objects.

Properties of commonly used building material

For a building to be resistant to climate change, it is necessary to select the building materials and construction methods that will provide durability regardless of climate conditions and geographical position of the building. By adapting building and construction methods to the local climatic conditions, a high level of protection cannot be achieved, because fluctuations in the local weather conditions are significant, especially concerning low temperatures, rain, wind, solar radiation, and others (Zarzycki, Decker, 2019).

It is therefore essential to choose strong and durable materials or materials with adequate protection since poor materials can cause damage to building components and in some cases disturb the stability of the construction structure (Ezema, 2019).

Durability and resistance to the effects of climate change have a direct impact on the economic and security aspects throughout the entire life cycle of the building. It is essential to consider climate changes in the adaptation of the existing, and especially in the construction of new buildings. Every dollar invested in preventing and reducing damage caused by weather disasters of the nation saves 4 dollars in future costs (National Institute of Building Science, 2005).

Wood as a natural material contains a certain degree of moisture (even if it is treated). Wood strength and density depend on the percentage of water in it. More water it contains the weaker and porous it will be. Exposures to different temperatures, as well as the relative humidity of the ambient air, causes these changes such as distortion swelling shrinkage and are severely weakening the wood (Teodorescu et al., 2017). Entirely stopping the movement of moisture in the outer wood structure is not possible, but there are ways to slow it down, by applying finishing coatings and thus preventing the decay of wood as a building material but only for a limited period of time.

Wood is the most prevalent building material in America because there, it is an inexpensive building material, and it takes fewer people and hours to build a house. Houses made of wood are not resistant to flooding, stormy winds especially hurricanes and tornadoes that appear more often due to climate change. Also, wood absorbs water and is susceptible to rotting. Brick is a product of the ceramic industry. It is a composite construction material consisting of several different materials (clay, water and sand), which is dried and baked.

Porous materials, such as bricks, have excellent water absorption capability. When the temperature drops below freezing, the water inside the block turns into ice. The process

of hardening leads to a change in the shape and spread of water. If there is no room for expansion, it will lead them to crack (Netinger et el., 2014). The same problem occurs when the frozen water dissolves. Since the process is repeated, whole bricks can begin to fall, which threaten the structural integrity of the building. Bricks exposed to frequent changes in sunlight throughout the day are also at high risk of damage (Hecroodt, 2002). Bricks are used as building materials in some parts of America, the European Union, and England.

Concrete is another material used in construction industry. The properties of concrete are conditioned with the proportions of the mixture it is made of (cement, aggregates, water and various additives). Its durability directly depends on the percentage of each component in the mixture. Concrete with the high water content is less resistant to ice than concrete with lower water content. Deterioration of concrete due to the freezing and thawing cycle can occur when the concrete is critically saturated, or when about 91% of its pores are filled with water. When water freezes and turns into ice, it has a 9% higher volume (Ravi, Karvekar, 2014).

Shrinking and expanding of concrete due to freezing and defrosting occurs during the winter season, which results in the cracking of the concrete surface. To avoid these problems in the construction industry, especially design waterproofed concrete is used especially in the areas exposed to corrosion. In construction, waterproof concrete and reinforced concrete are present in the territory of the European Union (Disarufino, 2015), and much of Asia. In the European Union, concrete is relatively inexpensive and highly durable building material.

Ferrocement can be described as a special type of reinforced concrete. When compared to reinforced cement concrete (RCC) ferrocement is thinner material, it has higher tensile-strength-to-weight ratio then RCC, ideal to use in zones prone to hurricanes earthquakes, fire and floods. (Salgia, Panganti, 2018). Ferrocement is relatively new and promising material. In recent years there was increased use of ferrocement in construction industry especially in the developing countries such as India (Sharma, 2016).

Florida is one of the states in U.S well known as hurricane prone area, where hurricanes like Irma left 25% of houses destroyed according to Federal Emergency Management Agency (FEMA, 2018). Instead the replacement and building new houses practice in Florida is to repair the damaged ones. Because of the structural integrity and the reparability, ferrocement can be an appropriate substitute to commonly used construction materials in Florida that were less resistant to hurricane forces (Adajar, Hogue, Jordan, 2006).

There are several methods of building low rise buildings using ferrocement. In this paper we presented MC^2 system as it represents inexpensive solution of construction that can reduce the time of building, maintenance costs and insurance cost of the house. Houses build using this system are resistant toward changing weather conditions caused by climate change. System is very flexible and it can be used to construct house of any shape and size. Most elements of the house are prefabricated and assembled directly on the

construction site. Compared to other construction systems, MC^2 system is considerably cheaper requires less manpower and working hours, it is prefabricated and it doesn't require extensive training for the workers. Construction objects have low maintenance costs and are energy efficient. MC^2 system is relatively new but internationally recognized construction system (Milinkovic 2001). Predecessor, version in development of MC^2 construction system and the house built to develop the system was used as inspiration for famous Florida mansion "Dome of a home" in Pensacola Florida which withstand many hurricanes since 2008 when it was built (Adajar, Hogue, Jordan, 2006).

MC system, based on prefabricated ferrocement elements won many awards among them: IFIA scientific gold medal, 6th International exhibition of Inventors, Suzhou China, 2008; Gold Prize, 1st International Exhibition of Inventions Slovenia, Celje, Slovenia, 2009; SEEBBE New Vision, 35th International building trade fair (UFI), Belgrade, Serbia 2009; IIPNF Leading Innovation Award, 7th International Invention show & Technomart, TaiPei, Taiwan, 2011; Energy Globe national award, Winner - Republic of Serbia, Traunkirhen – Austria, 2012.

MC^2 construction system

New construction system by prefabricated reinforced concrete elements, both wall and roof elements. MC^2 eliminate most of the disadvantages of concrete structures. Wall elements are three-layered, insulated without any thermal bridge. Inner and outer composite reinforced ferrocement layers are thin (2,5 and 4cm) providing that the entire element is lightweight with lower material consumption, making system user-friendly and easy to assemble. It makes concrete houses inexpensive, and it takes fewer people and hours to build a house. The inner layer of elements is separated from the static system of the object what eliminates the possibility of the appearance of cracks due to the sagging of the ground below the foundation and the building, and shrinking of onsite casted concrete, as well of outer concrete due to high temperature differences. Elements, both inner and outer layer, are precast in controlled factory conditions made of high-quality waterproof reinforced concrete. The compressive strength of such thin concrete, ferrocement is over 40MPa making it extremely difficult to damage. Elements are already waterproof facade so final coatings are aesthetic and materials are choice of the owner. One wall element is high as designed ceiling height, so there is no overlapping of elements or possibility of water damage of facade.

Roofing is made of "U" shaped waterproof thin composite reinforced ferrocement beams. Unique roofing elements are in the same time both structural and finishing roof elements which form all weather resistant structure. Joint brackets of elements in the same time present the structure for suspended ceilings and roof insulation enabling standard finishing materials and decoration.

MC^2 houses are resistant to any hurricane, typhoon, hail, rain etc. making object resistant to water damage includes the leakage occurred due to physical damage, while concrete is UV resistant. High-quality finishing of elements provides a variety

of possible aesthetic finishing of the house without applying of mortar facade over insulating boards which is commonly first ruined due to weather and natural influence. Decorative plasters, natural stone tiling or any finishing layer can be easily applied by adhesives or mechanical connections with steel anchors or similar without protruding the insulating layer in the element itself *(*Milinkovic Company, 2017*)*.

Conclusion

Climate change represents a challenge for the insurance and construction industry. Traditionally, the risk is calculated based on an analysis of the past events. The more accurate the study is, the more accurate the calculation of the risk will be. However, due to climate change, the analysis of past events can no longer be used to accurately assess the risk because the climate is continually changing. Instead one has to look into the future to predict and mitigate the risk. If the trend of unpredictability continues, insurance companies will have no choice but to withdraw the insurance against natural disasters. Reducing the availability of insurance can hurt the construction industry and the financial market. A better optimistic scenario includes a proactive approach to directly addressing climate change issues with synergy of development new construction systems and materials.

Much of the damage done to property due to the hurricane, floods, earthquakes and other natural disasters pulls its roots in poor design and weak materials used in the construction of the building. The chance for a hurricane to damage a ferrocement house is negligible compared to the damage he can make on wooden or brick houses. By using innovative construction methods such as the MC^2 construction system, damage to the property, caused by extreme climatic conditions can be significantly reduced. Continual growth of insurance premiums for homeowners and all real estate owners in general is not economically justified, nor possible without impact on global economy. Since it is impossible to have a positive impact on global warming and cancel the consequences of climate change in upcoming years it will be almost impossible to predict weather conditions which lead to natural disasters, and one must invest in constructing buildings that are more resistant to these events. This practice would provide affordable and sustainable insurance in the future, increase the quality of buildings and make a positive impact on society and global finance.

Conflict of interests

The authors declare no conflict of interest.

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