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Sustainability and Social Interest Housing

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SUMMARY

The article describes the concepts of sustainability in a historical view of the subject. The text assesses the evolution of the Minha Casa Minha Vida program (MCMV) and its relevant production for Social Interest Housing (HIS) in Brazil in this century. The research also lists the impacts of sustainable practices applied to that program. In the methodology, consultations in secondary sources (books, articles and theses) and the research of documents from the state, municipal and federal spheres stand out. This analysis of these documents is responsible for a more precise investigation on the subject. The conclusions highlight how the concept of sustainability applied to housing programs can generate increasingly higher standards of housing, suitable for the target audience.

KEYWORDS: Housing Program. Social Interest Housing. Sustainability

1 INTRODUCTION

This work associates the concepts of sustainability and social interest housing, outlining paths with the aim of proving that buildings, aimed at the low-income population, can be sustainable and serve as an example.

Sustainable construction is a relevant issue, in which there are environmental, social and economic gains for society as a whole. With regard to the environment, reducing the volume of waste and fossil energy consumption and the choice of materials for sustainable construction contribute to the preservation of the environment, as it is directly related to the causes of some of the main environmental impacts discussed. today (ACSERLRAD, 2009). Among the countless consequences, is the loss of biodiversity, soil degradation, the intensification of the greenhouse effect, reduced rainfall and water pollution.

In the MCMV program, sustainable actions can bring savings, for example in the energy bill and can generate professional activities for the residents themselves. Garbage recycling, planting in vegetable gardens and offering spaces in day care centers are examples that can be developed in the condominiums themselves. The incentive aimed at increasing the construction potential can even make it possible to purchase more central land, reducing urban voids, promoting the insertion of the most disadvantaged class into the city. The promotion, carried out by the State, favors the financial balance for the implementation of these solutions by builders and developers. By encouraging changes in the civil construction production chain for the social housing segment, a process is started so that other segments also start to act in a sustainable manner.

1.1 GOALS

Understand the advances and gaps in the sustainability criteria used by the federal government and the main developers of the HIS program, with regard to sustainability.

1.2 METHODOLOGY

The research method that was used is, according to Almeida, phenomenological as it is qualitative and descriptive of social reality, constructed as it is understood. (ALMEIDA, 2020). The nature of the research is basic, having the objective of generating new knowledge for the

advancement of science and, for that, it approached the data inductively, identifying the factors that determine the phenomena and explaining them.

As for technical procedures, consultations were made in secondary sources (books, articles and thesis). As a complement to the study, research was carried out in documents, made available by Caixa Econômica Federal (CEF), which deal with the specifications of the MCMV program, related to sustainability criteria.

2 CREATION OF THE CONCEPT OF SUSTAINABLE DEVELOPMENT

With the technological development of the Industrial Revolution, from the 17th century, and especially in the 19th century, there was an advance in the production environment, reflecting on architecture, through the modern movement. The Industrial Revolution provided for the exploitation of natural resources on a large scale, due to the increase in production capacity, caused by technological advances and the optimization of the production line. This technological shift was responsible for improvements and economic growth, but also for major unforeseen problems at the time, such as environmental degradation, a result of its predatory exploitation and the advance of social inequality, as a result of working conditions in large factories.

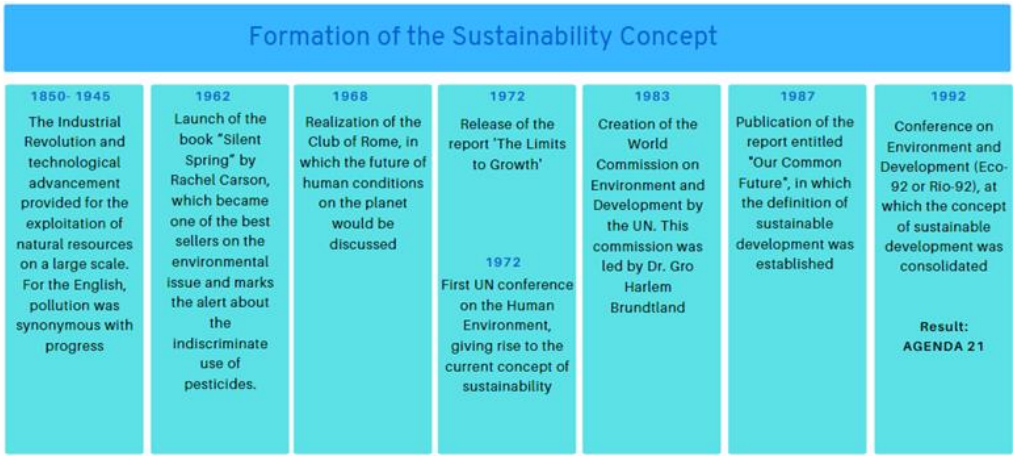
During the 20th century, there was a predominance of Modern architecture, which is now seen as progress, thus giving rise to an international style of the model. The use of glass, concrete, marble, metals, replacing the sense of monumentality with practicality, begins to deny regionalism and is not limited to locally available resources. From then onwards, the style quickly spread throughout the world; according to Zambrano, an architectural aesthetic, based on metallic structures, fully glazed, abandoned the use of construction techniques for the exploration of natural and free resources, increasing energy consumption within buildings. (ZAMBRANO, 2008)

Solar Architecture (passive or active) was a solution presented by the architecture sector to the world energy crisis, which occurred in the 70s, resulting from the oil shock. This architecture aimed to reduce or eliminate dependence on non-renewable forms of energy, fossil fuels or nuclear energy, exploring the potential of solar energy resources, through their relationship with the microclimatic environment. (ZAMBRANO, 2008).

In the 1960s and 1970s, worldwide reflections on the damage caused to the environment and the first efforts towards ecological awareness began. During this period, there was the launch of the book “A Silent Spring” by Rachel Carson, which became one of the best sellers on the environmental issue and marks the alert about the indiscriminate use of pesticides. In 1972, the first conference of the United Nations (UN) on the Human Environment (UNCHE) took place in Stockholm, Sweden, drawing the world's attention, especially in relation to environmental issues and pollution, giving rise to the current concept of sustainability . Figure 1 registers this moment and the evolution of the concept.

“Sustainable development is development that meets current needs without compromising the ability of future generations to meet their own needs.” (UN, 2020).

Chart 1: The Formation of the Concept of Sustainability



Source: UN, 2020. Adapted by the authors

From the 1980s onwards, Bioclimatic Architecture gained strength. Such architecture consists of the design of buildings, considering the climatic conditions, using the resources available in nature (sun, vegetation, rain and wind) to minimize environmental impacts and reduce energy consumption. This was a moment in which a great advance was observed, in architecture, in the development of techniques and passive devices for protection or use of the effects of the microclimate in relation to the building, using parameters of temperature, solar radiation, humidity, wind, variations depending on the latitude and altitude of the place, as well as annual variations, observed in the same place, depending on the cycles of seasons.

In the late 1980s and 1990s, the so-called Sustainable Architecture, Green Architecture or EcoArchitecture emerged. This concept started to consider the quality of buildings, not only valuing a good integration with nature and the exploitation of natural and climate resources to promote comfort, but also the various aspects related to the environment, considering the entire life cycle of the building, from the manufacturing process of building materials to dismantling at the end of the building's useful life. At that moment, people became aware that the building is not related solely to its immediate environmental environment. The inputs used for its production and the waste generated throughout its life cycle impact nature, from the local to the global scale, contributing to global warming and climate change.

In 1983, there was the creation of the World Commission on the Environment and Development, by the UN, led by the physician Gro Harlem Brundtland, resulting in the publication of the report entitled "Our Common Future", in which the definition of sustainable development was established.

At the 1992 conference on Environment and Development in the city of Rio de Janeiro (Eco-92 or Rio-92), the concept of sustainable development was consolidated, giving rise to Agenda 21, a planning instrument for building societies sustainable, on different geographic

bases, which reconciles methods of environmental protection, social justice and economic efficiency.

From the turn of the 2000s onwards, the approach has evolved in order to account, not only for environmental aspects, but for all the problems involved in Sustainable Development (environmental, economic and sociocultural), whose resulting architectural object is called Architecture Sustainable. In the balance between social, environmental and economic aspects, Sustainable Architecture aims, as a priority, to improve the quality of human life, within the limits that ecosystems can support. Thus, architecture must not only be concerned with reviewing practices in relation to the environment, but also in relation to what interferes with the people and cultures involved.

Sustainable development is not a fixed state of harmony, but a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional changes are made consistent with future needs as well as with the present needs. (ZAMBRANO, 2008).

To be considered sustainable, a construction must encompass three aspects, provided for in the concept of sustainable development, represented by the scheme known as the Triple Bottom Line (People, Profit, Place), that is, the construction, necessarily, has to be ecologically correct, economically viable and socially fair.

To be ecologically correct, it is necessary to: promote the reduction of gas and chemical emissions by equipment and/or materials, improve waste treatment and recovery techniques, improve water recovery and recycling techniques, reduce energy and energy consumption. operation and develop new materials whose manufacturing processes are less impactful and require less energy consumption. (LIMA, 2018)

To be considered socially desirable, buildings have to be healthy, with good air, thermal and acoustic conditions, be located in places with all the necessary infrastructure so that its residents can enjoy the city with dignity and comfort. In addition to residents, sustainable construction should also promote improvements aimed at employees throughout the construction chain and other residents of the city.

To be considered economically viable, construction must be able to reduce or maintain operating costs, provide a return on investment, increase productivity and employee satisfaction, and generate quality products. The building must provide low maintenance requirements.

The concepts were, over time, "refining" and, ten years after RIO-92, a new conference on Environment and Development was held, at the time in Johannesburg, Africa, called RIO+10, with the objective evaluate the progress of the agreements established at Rio -92, and, based on Agenda 21, the countries proposed to renew the commitments signed previously. One of the documents produced during Rio+10 was the Johannesburg Declaration, which included in its

discussions social aspects and people's quality of life, poverty eradication, water use, management of natural resources and sustainable development.

> The second edition of the Brazilian Agenda 21 is based on: saving savings in the knowledge society, social inclusion for a solidary society, strategy for urban and rural sustainability, sustainable strategy for natural resources (water, biodiversity and forests), governance and ethics for the promotion of sustainability. The document also brings the advances that took place in the ten years marked between the two conferences. In which the progress of the business community in relation to the subject is scored. (BRAZIL, 2004)

Finally, in September 2015, the Sustainable Development Summit took place in New York, at the UN headquarters. All participating countries defined the new Sustainable Development Goals (SDGs) as part of a new sustainable development agenda with a deadline of 2030. This agenda is known as the 2030 Agenda for Sustainable Development.

3 SOCIAL INTEREST HOUSING

It is not necessary to look closely to notice the social inequality contained in Brazilian cities. The lack of financial resources, or the misapplication of them, and the non-compliance with the City Statute make the city experience differently by each social class, as access to transport, health, education, security, culture, technology and basic sanitation do not occur isonomically. The high housing deficit is the result of social inequality, arising and enhanced since colonization and the capitalist model, which has as its principle the valuation of land.

Land tenure regularization, rehabilitation of central areas, combating urban voids, urbanization of slums and peripheral areas, prevention of the risk of landslides are some resources that can be adopted by cities for better use of urban space and to promote quality in housing. However, the lack of control over land use and occupation brings urban inequality and environmental destruction as a consequence.

> The colonial agro-export relationship; slavery for 300 years; the late insertion in the industrialization process, focused on the capitalist demands of the international market and not on the basic needs of the internal market; globalization; the patrimonial society and political patronage are some of the factors presented by Maricato, which would contribute for Brazil to be considered today as one of the countries with the greatest social inequality, even though it is one of the ten largest economies in the world. The economic crises result in the fiscal austerity policy, reducing public investments that are not of interest to those in power, increasing violence, slums, the advance of cities to the periphery and the return of epidemics that have already been eradicated, among other problems (MARICATO, 2011, p. 99 - 180).

The expansion of cities, caused by population growth and rural exodus, generates social disturbances, with the main problem being the housing deficit and lack of basic sanitation. These needs are said to be primary, as housing brings dignity and improvement to all other areas still lacking in our society. Having a healthy home means less public expenditure on health, and

belonging to the address allows for a greater opportunity to generate income, since every citizen needs to present an address to become a formal employee, greater security due to social interaction and an increase in the level of education , which in turn also implies better wages.

In the more recent past, there was the creation of the first Master Plan of Rio de Janeiro (Law nº 16/1992, 1992) and the City Statute (Law nº 10,257/01, 2001). Both present as basic principles participatory planning and the social function of property. The content of the texts points to guidelines that lead to a city for all, harmonious, sustainable and democratic. (PCRJ, 1992) and (BRAZIL, 2001).

"Urban chaos is not caused by the lack of laws or planning, but by non-compliance with them. " (MARICATO, 2011, p.53).

In Rio de Janeiro, the invasion of urban lands, carried out by the most disadvantaged groups, and sometimes involving militiamen, is visible. Irregular constructions are monitored by civil society, which leaves aside its supervisory role, and awaits a decision from Organs competent bodies, which often allow this practice, since there is no housing for everyone. In the city, irregular construction is also carried out in environmentally protected or environmentally fragile areas, which are not of interest to the real estate market, as their occupation is prohibited by law. "The legal residential market in Brazil serves close to 30% of the population. " (MARICATO, 2011, p. 185).

In terms of social housing, both the federal and state government, as well as the municipalities, have programs to reduce the housing deficit. The technical assistance for social interest housing (ATHIS), regulated by Law 11,888/2008, provides free access for all families with income of up to three minimum wages to professional architectural services for the construction, renovation and expansion of their homes (FNAU, 2019). Social rent, provided for by Law 8,742/1993 (BRASIL, 1993) and Decree 6,307/2007 deals with the amount to be paid and the people who are entitled to receive this assistance (BRASIL, 1993 a). Also considered in the issue are: Public-Private Participation (PPP) for social housing and the MCMV program, which provides, in addition to housing construction, to land regulation. (BRAZIL, 2009).

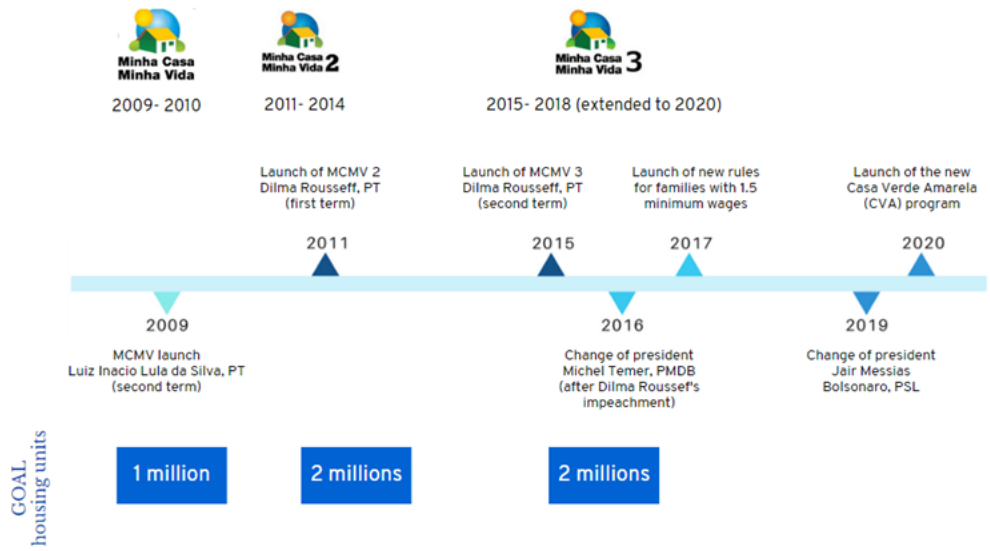
> The MCMV program was launched in March 2009 by the Federal Government, regulated by law 11,977/2009, in partnership with states, municipalities, companies and non-profit entities; it aims not only to reduce the housing deficit, but also to boost the economic development, since the construction sector was hit by the mortgage crisis that occurred in the United States in 2008. (BRASIL, 2009).

The program was then part of the Growth Acceleration Program (PAC), launched in 2007, which consisted of a series of actions and measures to accelerate the economy through public investments in various areas of infrastructure. The MCMV program fulfilled the objectives of increasing the income of the workers involved and accelerating the economy, due to its extensive production chain that generated jobs in construction companies, developers and

service providers; in the industry and trade of building materials; for suppliers of machinery, equipment and tools, as well as technical-professional, financial and insurance services.

According to IPEA, the impact on the country's economic activity is as follows: “for every R$1 million disbursed by the program, another R$890,000 are generated in income. ” (IPEA, 2013, p.14).

Figure 1: MCMV Program 1, 2 and 3



Source: BRASIL, 2009. Adapted by the authors

The MCMV program was linked to the National Housing Secretariat of the former Ministry of Cities, which coordinated the granting of benefits with Caixa Econômica Federal, Banco do Brasil, local governments and entities and established a wide range of strategies to favor housing acquisition , through the subsidy, associated or not with the granting of credit, financing with reduced interest rates, extended terms and the possibility of using the Employment Compensation Fund (FGTS) for the acquisition of housing, according to guidelines already applied by the BNH between the years 1964 and 1966.

Subsidy benefits and financing rate were structured by the gross family income tiers. In 2009 the program was launched with 3 tiers to serve families earning from 0 to 10 minimum wages, with a 90% subsidy of the property value for tier 1 and tier 2 up to R$25,000.00 (currently R$29,000.00). To solve the government's cash limitation, the 1.5 tier was launched in the third phase of the program, and, as of 2019, the 1.5 tier units started to represent at most 50% of a project, limited to 150 units.

4 SUSTAINABILITY IN THE MCMV PROGRAM

Talking about sustainability for the MCMV, which has so many criticisms in relation to the built location, far from urban centers, is somewhat utopian, since the issue is in the cost of land versus value subsidized by the government for tier 1. For the other tiers However, given that the customer has the power to choose, location becomes a determining factor for the successful sale of projects launched, reducing the problem of location.

As mentioned above, in order to align the Civil Construction sector with the principles of sustainability, it is necessary to involve a balance between three dimensions: economic, social and environmental. Thus, the profit that allows for the satisfaction of the interests of all those involved in the process must be sought. Investors must have a financial return, the local community must enjoy the benefits of business activity, employees must have their return in quality of life and social equity, and all of this must not harm (or at least the impacts must be minimized) the environment, which everyone needs to survive (LIMA, 2018).

At both the federal and municipal levels and private companies, some initiatives were taken to promote sustainable construction, but little was put into practice. Several initiatives are listed below:

The Housing Secretariat of the municipality of Rio de Janeiro has a document with recommendations, guidelines and specifications for the development of sustainable housing in the MCMV program (PCRJ, 2001) and a collection of Notebooks Minha Casa + Sustentável, divided into four volumes. as an objective to contribute to better qualification of urban insertion and qualification of urban design (CAU, 2016). This document can be considered a guideline for companies to build in a sustainable way, however, none of this entails any obligation on the part of entrepreneurs, focused on this market niche. Caixa Econômica Federal, in turn, developed the Casa Azul Seal, which is a socio-environmental classification of financed housing projects that uses sustainable measures, actions and practices. (CEF, 2020a). Caixa Econômica federal evaluates the projects in six categories, which include some mandatory items and others of free choice. The city of Rio de Janeiro also prepared its Master Plan for Sustainable Urban Development (Complementary Law 111, of February 1, 2011) (PCRJ, 2001) and Qualivede (Decree nº 35745/12), this is the most recent legislation for sustainable buildings in Rio de Janeiro, however, the qualification is optional and applicable to new and/or existing building projects. (PCRJ, 2012).

Currently, there is a Senate Bill (PLS) 252/2015 that will go to the Plenary, which aims to provide tax incentives for the adoption of sustainable construction techniques. The proposal defines as a sustainable construction technique the implementation of green roofs and water reuse, as well as the adoption of solar energy and rainwater use systems. In addition, the project suggests that, in buildings owned by the Federal Government, the planned sustainable construction practices should be implemented, if they are technically and economically viable (BRASIL, 2014).

There are also labels to identify the energy performance of buildings, such as: Procel Edificações – created in 2003 by ELETROBRAS/PROCEL, an optional adhesion instrument whose main objective is to identify the buildings with the best energy efficiency ratings. In 2017,

PROCEL Edifica, together with the Brazilian Center for Energy Efficiency in Buildings (CB3E), launched a new proposed method for evaluating the energy performance of buildings based on primary energy consumption, called the Energy Efficiency Label for Buildings (PBE Builds). Currently, labeling is available for: commercial, residential, service and public buildings. (INMETRO, 2020)

> The consumption of electricity in buildings corresponds to about 45% of the consumption billed in the country. It is estimated a potential to reduce this consumption by 50% for new buildings and 30% for those that promote reforms that include the concepts of energy efficiency in buildings. (INMETRO, 2020)

BNDES provides a specific financing line for projects aimed at sustainability. (BNDES, 2020).

In addition to these initiatives, two methodologies for sustainable construction certification are active in Brazil: LEED is an American certificate, granted by the Green Building Council Brazil (GBC). This certificate has several modalities in order to promote best practices in construction. (GBC, 2020); and the ACQUA-HQE, French certificate for sustainable construction. The Vanzolini Foundation, from the University of São Paulo – USP, was responsible for its Brazilian adaptation and is the one who grants it. These certifications have sustainable measures, criteria and practices that can be adopted for the project, from project design to post-construction. These measures aim at the environmental quality of the building and encourage a more sustainable management of water, energy and waste. Entrepreneurs benefit from differentiating their portfolio in the market, gaining international recognition and proving the high environmental quality of their buildings. (ACQUA-HQE, 2020).

The document developed by the city of Rio de Janeiro for the MCMV program acts on three fronts: environmental, economic and social. Aiming at environmental sustainability, the document provides guidance on rationalizing the use of water, improving air quality, reducing garbage, solid waste and civil construction waste, conserving natural resources and reducing pollution sound. Regarding the economic issue, the document highlights the rationalization and efficient use of electric energy, the improvement in production and the reduction in the costs of conservation and maintenance of the building. In the social sphere, the document points out the improvement of the quality of housing, in order to design safe and healthy constructions, with good use of natural conditions, such as natural light, acoustics and ventilation, in addition to aiming at the construction compatible with the local and adequate environment to the surrounding landscape. Also in the social sphere, the optimization and use of local infrastructure is planned, such as the public transport system, schools, health posts, squares, water supply, sewage and drainage collection and treatment services, garbage collection and combating fire. (PCRJ, 2009).

Of the initiatives mentioned above, all follow the same line as the document for sustainable construction for the MCMV prepared by the PCRJ, and only the bill (PLS) 252/2015 suggests tax incentives, but without detailing them.

According to the government's statement, in the second version of Agenda 21, regarding the increase in the awareness of the business community for the need to implement sustainable actions throughout the production chain, there is an example for the civil construction segment of the largest Brazilian developer for the market of social housing – MRV. The construction company, in its sustainability report for the year 2019, based on the UN 2030 Agenda, presents the management process considering: the efficiency in the use of resources, the environmental quality of materials, the lowest environmental impact of the materials used, the reduction of waste, efficiency and quality in construction and control in the use of concrete, with a concern with water management, energy efficiency, quality of architectural design (aiming at environmental comfort), management of materials and impacts on the neighborhood during the work and processes for the management of waste and greenhouse gases. (MRV, 2019).

MCMV has been undergoing continuous improvement. In tier 1, there was an increase in the size of the dwelling from 35 m2 (MCMV1) to 40 m2 (MCMV3), mandatory ceramic flooring in all environments, tiles on all kitchen and bathroom walls, solar water heaters in houses, implementation of afforestation, water saving devices (discharge), compartment for selective garbage collection, individual water consumption metering and water reuse in shared areas. In addition, the MCMV started to provide social work with the beneficiary families, including educational actions for condominium management, environmental and financial education, post-occupancy assessment, among others (BENEVIDES, 2020).

5 CONCLUSIONS

The MCMV ends, with a record number of social housing contracts, in the entire history of Brazil and confirms itself as a great driver of the economy, generator of formal employment and an efficient model to promote housing for the low-income population.

The program adapted to the limited resources of the Brazilian economic reality and managed to remain active, despite continuous reductions in subsidies, proved to be viable, albeit on a smaller scale, mostly anchored in real estate credit with financing rates lower than those practiced in the market , allowed by the directed resources of the FGTS.

At the same time, we note today that a good portion of national entrepreneurs has a better understanding of their role as a transforming agent in society. This role, together with the awareness of the population, as long as combined with government incentives, will be able to implement, in fact, ever higher standards of sustainability.

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