

Sustainable Development Goals in the COVID-19 Pandemic

Subjects: Microbiology | Infectious Diseases

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The Sustainable Development Goals are a global call to action to end poverty, close the gender gap, protect the planet, and improve the lives of people around the world. In 2015, the United Nations General Assembly adopted 17 goals as part of the 2030 Agenda for Sustainable Development, which sets out a plan to achieve the goals in 15 years. However, the COVID-19 pandemic crisis has been a turning point in the achievement of these goals, due to all its consequences at the political, economic, and socio-cultural levels.

Keywords: COVID-19 ; sustainable development goals ; peace ; justice ; inequalities ; energy ; gender ; education ; sanity ; industry

1. Background

Sustainable Development has become a catchphrase for international marketing agencies, a slogan for development and environmental activists, and recently a main theme of conferences and academic paper ^[1]. However, the concept remains unclear as to its meaning and what it represents ^[2]. The concept of sustainable development dates to 1713, when it only meant ensuring forestry sustainability ^[3]. Currently, the definition of sustainable development is the one used in the Brundtland Report, which defines it as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” ^[4].

The Millennium Development Goals (MDGs) have been a historic and effective form of global mobilization to achieve a set of important social goals worldwide. They express widespread public concern about hunger, poverty, lack of schooling, disease, environmental degradation and gender inequality. By grouping these priorities into eight measurable and time-bound goals, the MDGs help promote political accountability, global awareness, social feedback, improved measurement, and public pressure. The MDGs became a way to measure the fight against poverty during the 15 years from 2000 to 2015 ^{[5][6]}.

However, it was not possible to achieve all of the MDGs' objectives, so that the Sustainable Development Goals (SDGs) were adopted by the United Nations (UN) in 2015 including: 1. no poverty, 2. zero hunger, 3. good health and wellbeing, 4. quality education, 5. gender equality, 6. clean water and sanitation, 7. affordable and clean energy, 8. decent work and economic growth, 9. industry, innovation and infrastructure, 10. reduced inequalities, 11. sustainable cities and communities, 12. responsible consumption and production, 13. climate action, 14. life below water, 15. life on land, 16. peace, justice and strong institutions and 17. partnerships as a common way of acting to try to end poverty, protect the planet and ensure that by 2030 the entire planet can enjoy prosperity and peace ^[7]. Even so, it has been stated that by 2030 only 53% of variables regarding sustainable development will have been achieved ^[8]. This information can be seen in **Figure 1** and **Figure 2**. **Figure 1** shows a worldwide spectrum image of the SDGS index, while **Figure 2** shows the SGD index countries by order of their achievement regarding the SDGS' 17 goals.

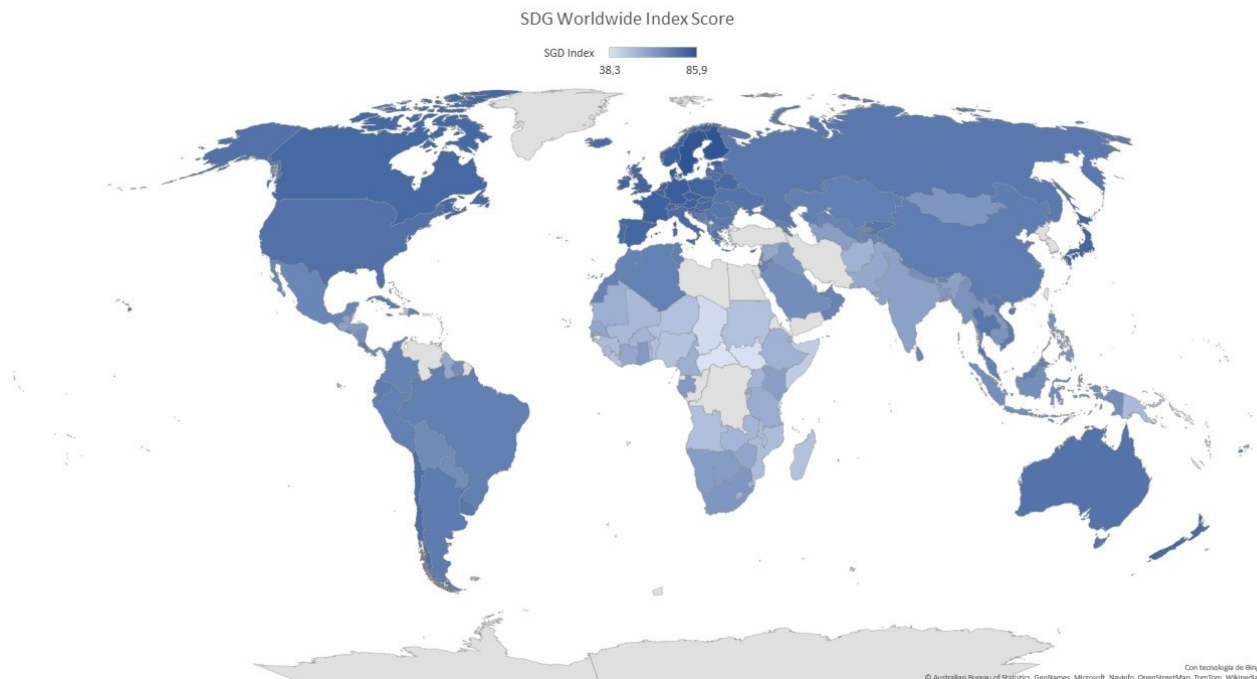


Figure 1. SDGS Worldwide Index Score. Own elaboration, data extracted from the database: www.SDGIndex.org/reports/sustainable-development-report-2020 (accessed on 16 April 2022).

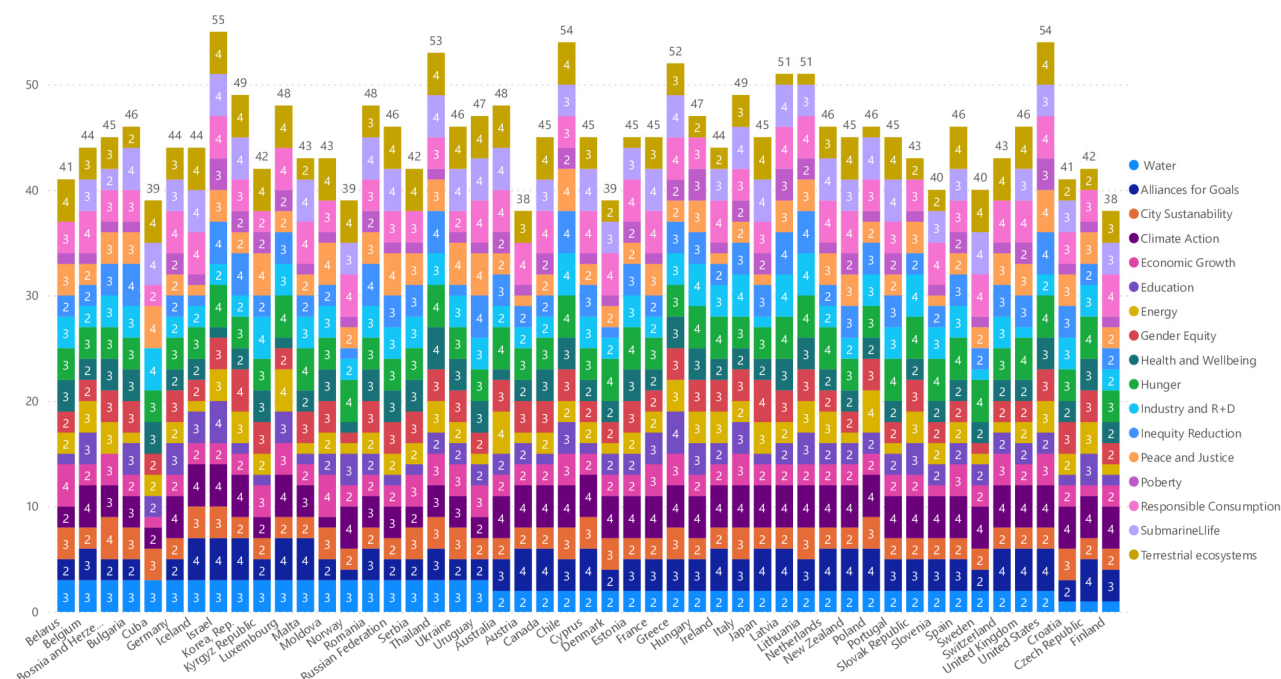


Figure 2. Millennium Development Goals. Own elaboration, data extracted from the database: www.SDGIndex.org/reports/sustainable-development-report-2020 (accessed on 16 April 2022).

This figure of 53% countries with sustainable development will be highly impacted by the arrival in 2019 of the severe acute respiratory syndrome coronavirus (SARS-CoV-2) [9][10]. With an actual impact to date 4 February 2022, of 386,548,962 confirmed cases, including 5,705,754 deaths reported by the World Health Organization (WHO) [11], it has become a new challenge for the world, posing a huge threat to the implementation of the UN SDGs [12]. The COVID-19 pandemic has generated enormous pressure on the world economy and business operations, as well as having major financial implications, just as it has increased poverty and hunger worldwide [12], slowing progress towards sustainability [13]. This jeopardizes our ability to achieve many of the 17 UN SDGs in the framework of the 2030 Agenda for Sustainable Development [14], while reducing the importance of the SDGs for the world's governments [12]; a major part of their resources are being diverted to fighting this crisis, so sustainable development is being put on the back burner [13].

Given the current situation and the volatility of markets, governments and unexpected changes in COVID-19 curves and waves, numerous publications and information is necessary to be able to face the current scenario with scientific rigor. Along these lines, narrative reviews offer an objective and critical analysis of current findings, offering and establishing theoretical frameworks. However, narrative reviews have been criticized because they rarely employ peer-reviewed

methodologies, or because they may duplicate evidence, and often do not indicate the inclusion criteria of the studies [15]. However, since the appearance of COVID-19 in 2019, over 1372 reviews have been published and indexed in PubMed up to February 2022. Many of these articles contain a much higher number of citations than the original articles themselves. This is largely due to the vast need for information and thematic frameworks that are needed regarding COVID-19, whether epidemiological models [16], herd immunity [17], specialized nutritional guidelines [18] regarding COVID-19 disease, mental [19] health, new insights, and perspectives [20] or a gender approach [21]. The affected UN SDGs during the COVID-19 pandemic that are analyzed in the present entry are:

Poverty and hunger: Today, 736 million people still live in extreme poverty, while the number of people suffering from malnutrition exceeded 821 million in 2017. The goal of the SDGs is to aim to lift at least half of men, women and children of all ages out of poverty in all its dimensions, as well as to end malnutrition by 2030 [7]. COVID-19 has widened the differences between social classes and different economic strata, with an emphasis on poverty. The authors suggest that the initial response of COVID-19 had to focus on impactful actions, but at the same time neglected the interests of the poorest and most vulnerable population. Thus, these global responses exacerbated the problems of the poorest, due to the disruption of food supplies, as well as the problems of sick people who could not access hospitals [22].

Sanitation and life in water and on land: in 2015, 844 million people were lacking basic drinking water and 2.3 billion people still lacked basic sanitation in 2015. The UN seeks to obtain equitable, affordable, and universal access to safe drinking water, as well as access to adequate hygiene and sanitation systems for all [7]. However, COVID-19 also jeopardized this goal. The authors propose the case of Fiji's aquatic ecosystem as an example. 61.36% of respondents wore masks and 38.64% wore gloves. In Fiji, most citizens use masks, while gloves are used by medical professionals, police officers, municipal waste managers and shopping mall workers. This negligence by Fijian citizens has resulted in damage to the marine ecosystem, which is a grave and worrying concern [23].

Education: the SDGs aim to ensure that, by 2030, all girls and boys have access to a complete free, equitable and quality primary and secondary education, as 103 million young people in the world are still not literate, and most of them are women [7]. Students from infant education to university have suffered a variety of breaks in attendance in classrooms. Restrictive measures and fear from parents have had an impact on education and teaching quality. Only prospective studies will be able to clarify the potential effects of COVID-19 on education.

Gender equality: it is estimated that one third of the world's women have suffered physical and/or sexual violence at some point in their lives. The UN intends to seek ways to eradicate all forms of violence and discrimination against all women and girls worldwide [7]. The authors emphasize that, during the pandemic, an increase in domestic violence and intrafamily violence has been observed, becoming especially acute during the quarantine period and in Latin American countries [24].

Sustainable cities, communities, and climate action: 4.2 billion people lived in cities in 2018 and by 2050 the urban population is projected to reach 6.5 billion. To be sustainable, the UN seeks to ensure access for all to safe and affordable housing, access to basic services, and the achievement of slum upgrading, as well as reducing the impact of cities on the environment, with a focus on ensuring safety and air quality [7].

Work and economic growth: through diversification, innovation and improvements in technology, the SDGs hope to achieve higher levels of economic productivity, especially by focusing on labor-intensive and high value-added sectors [7]. The onset of the COVID-19 pandemic triggered an unprecedented crisis, not only because of health and social shocks but also because of a deep global economic recession, having more than double the impact of the 2008 financial crisis [7].

Clean energy and responsible consumption and production: the UN aims to reduce waste generation through prevention, reduction, recycling, and reuse to achieve a more sustainable and efficient management of natural resources by 2030 [7].

Industry, innovation, and infrastructures: the SDGs seek to develop quality infrastructure, which is sustainable, reliable, and resilient, to support human well-being and economic development, with a focus on equal and affordable access for all, as well as adapting industries to become more sustainable and improving infrastructure, with greater resource efficiency and improved use of clean and environmentally friendly technologies and industrial processes [7].

Inequalities, peace, and justice: by the end of 2017, 68.5 million people were forcibly displaced by conflict, human rights violations, and violence. To combat this situation, the SDGs seek to significantly reduce all forms of violence and all related deaths, end child exploitation and abuse, trafficking and all forms of torture and violence, and seek to partially reduce bribery and corruption [7].

This Sustainable Development Goals (SDGs) implemented by the United Nations in 2015 comprise the most ambitious global agenda adopted at the international level to direct collective action around common objectives. They aim to fight extreme poverty, while integrating and balancing various essential dimensions of sustainable development such as social, environmental, and economic, providing an outline on how to approach global policymaking. However, the complex architecture under which they have been designed, the criticisms of the international community and their technical limitations, not to mention the worldwide pandemic suffered in recent years due to the COVID-19 virus, point to major limitations in the feasibility and implementation of all these objectives for building a better planet for future generations [25][26].

2. Poverty and Hunger

The 2030 Agenda's Objectives 1 and 2 focus on "*eradicating poverty and hunger in all its forms in the world*". These objectives are especially important in a period of global pandemic [27]. Developing countries have been very preoccupied by the difficulties associated with the presence of COVID-19 over the past two years [28]. In addition to the risk of infection, there are concerns about not being able to earn enough income to buy food, and access essential medicines and basic health services [29]. There has also been a clear decline in school-age children's access to education, increasing the risk of them dropping out of school on a permanent basis [30]. This is related to the decrease in income within the family, as children must be able to contribute to the family economy and are forced to work [27][31].

In addition, the costs incurred by the appearance of the pandemic in the social and health spheres are forcing governments to allocate extraordinary budget allocations and plan programs for prevention, containment, surveillance, and care of the disease [31]. All these budgetary needs are leaving countries with fewer resources in a situation of economic, social and employment inequality, putting at risk that the goals set can be achieved within the stipulated timeframe [32]. The economic debt of developing countries has risen sharply in recent months and income from tourism, normally the largest source of revenue for these countries, has been severely affected by the global measures taken to prevent the spread of the virus, which have halted travel between countries [33].

Although in recent years the data collected on the progress of poverty and its eradication seemed to indicate that the levels of extreme poverty were being significantly reduced, the appearance of the pandemic and the tendency not to end the risk of contagion and with it, the increase in deaths, is threatening a setback in the progress achieved [34][35]. Countries in Latin America, sub-Saharan Africa and Asia are seeing COVID-19 as having serious consequences for their development as countries [36]. In this context, India, among other countries, has seen a major health crisis grow in recent months, as it has not been possible to reduce the virus propagation in a population in which elementary sanitary measures such as social distancing or confinement at the time of infection cannot be maintained [37]. This, together with the lack of access to the medical system, reaffirms that the most vulnerable people, due to a clear lack of economic resources, will suffer greater comorbidity and will be more affected in terms of contagion and recovery from the disease. In addition, this is combined with the need not to leave the workplace even if they are ill, increasing the number of deaths, without the possibility of a recovery [38].

Along these lines, the COVID Observatory created for Latin America and the Caribbean (ECLAC), with the objective of compiling information on the different actions taken by the governments of these countries to confront the pandemic, has yielded significant data on the advance of poverty and hunger due to the questionable measures implemented, and the damage that has resulted from them and which will continue over time [39]. In these economically depressed countries, rigid confinement may help contain the disease, but will negatively affect an already declining economy [40]. Moreover, poor access to vaccines has prevented the number of contaminations and deaths from declining in the same way as in better-off countries with greater access to pharmaceuticals [41].

The economic and social impact of COVID-19 has highlighted the difficulties countries face in dealing with a global catastrophe. However, this has been exacerbated in developing countries, where the protocols in place have only widened inequalities in the distribution of resources and increased the risk of vulnerability of the most socially disadvantaged [42]. This disease is going to have a very negative effect on poor people, favoring the appearance of hunger, child malnutrition, children dropping out of school, etc. in these already vulnerable contexts [43]. In short, poverty levels will increase considerably, rendering the progress made in the last decade useless and returning to the levels of malnutrition, hunger, and poverty of 8 or 10 years ago [44]. Reversing this situation when the advance of the pandemic seems to be lasting over time is going to be very complicated and will affect people under 18 years of age in a more specific way [45].

3. Education

During the COVID-19 pandemic, adolescents and children have not only been exposed to adverse social circumstances, but to effects on their mental health, well-being and (lack of) management of school responsibilities and homework [46][47]. This pandemic has greatly impacted education at all levels worldwide, with more than 290 million students affected by the shutdowns and a rapid face-to-face transformation towards e-learning [48]. This forced transition has raised the question of whether online education would foster inequalities and the challenge of meeting the United Nations Sustainable Development Goal for education [48], “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” [49][50].

Changes in the teaching process have usually been relevant to the stage of pandemic development [51]. The benefits of Information and Communication Media Technologies (ICMTs) have been widely studied and in educational contexts these are multiple. Especially, they enhance holistic learning through an instant access to information and communication all over the world [52], collaborative tools, and more autonomous and conceptual learning [53]. However, there are still some drawbacks associated with e-learning. For instance, the previous experience of the students in the use of ICMTs can affect their academic performance due to lower self-confidence, anxiety, or a higher need for time-management without the immediate help of instructors or classmates [48][54]. However, cultural, and socioeconomic reasons are the most important factors that can affect online education. Over 40% of the global population does not have Internet access (at home or at school), which constitutes a potential risk of educational segregation due to affordability or lack of technical infrastructure [48][55][56].

Cultural differences among countries were particularly obvious in Africa. Concretely, in South Africa they developed a “no students left behind” approach in which an early lockdown and a modification of the academic year were needed, considering that not all the students could afford the technology for online lessons. The efforts of the education system were directed towards promoting partnerships with technology and data providers to give laptops and Internet access to the students who did not have these resources [57]. However, not only technical and curriculum support are key components for success, but well-being and affective support are also determinant factors influencing education success [51][58]. These issues can be developed through the encouragement of a feeling of belonging and identification with the University, so the students have certainty that they are going to be supported and pushed to achieve their degree [59]. In Algeria, similar issues were found: internet access, technology access, motivation and previous knowledge of online teaching culture, and correct teacher’s online training are key factors in making education sustainable in the future [60]. Similarly, research in South America suggests the development of educational institution policies which encourage an agile methodology to provide the students with the competencies and skills demanded in these times of rapid change [61][62]. Specific training methods should address sustainability as a goal for future graduates [50]. Education also has a very significant role to play in preventing the academic community from suffering psychological diseases due to their isolation and lack of socialization, so there is a need to promote contingency plans in case of a pandemic, that fosters both offline and online approaches in case they are needed [51][53]. In Europe, some studies are being carried out which develop a novel method of education of the elderly, such as promoting the quality of life of the students of the newly created U3As in Belarus and Ukraine, which have copied the Polish model. These investigated the general quality of life of university students at the level of three components: level of stress, sense of self-efficacy, and level of life satisfaction [63][64]. Other European studies on the sustainability of education have focused on gender inequalities and labor market impacts. In Poland, the burden of childcare when following online lessons fell mainly on women, yet at the same time economic difficulties left some children unassisted during their online lessons at school [65][66]. In any case, gender inequalities were not increased but maintained over time during the pandemic, along with the challenge of improving the mechanisms to ensure mental well-being of children and adolescents, and to provide more access and technology abilities to people who live in rural areas [67]. If researchers take the middle school, the most important factors to enhance online education in case of a pandemic situation are attitude and self-efficacy towards technology (internet and computers), instructor response times and behavior during on-line learning [68]. Reflective practice and critical thinking are key components for teachers to make their students autonomous and self-sufficient in case they have to face online teaching [53][69]. Not only drawbacks, but also opportunities have come up during the pandemic. In Taiwan, a web-based learning system to teach English reading worked better than the paper-and-pencil approach, suggesting a sustainable model for the future in high-schools [70]. Digital literacy and health education are key factors to enhance at all educational levels as transversal knowledge to make sure learning and self-protection standards are maintained during a pandemic [69][71]. Education can be influenced by technical infrastructure as well as other aspects, in a case study in Wuhan, the main challenges were on-line education, medical services, logistics assistance and support for graduate employment development [72][73].

4. Gender Equality

Gender equality is an essential element of social equity. Despite this, gender inequality reduces the chances of many women of living a secure and fair life. UN Women and the Department of Economic and Social Affairs note that women ^[74] and girls around the world are far more likely to live in extreme poverty than men and boys, a figure that rises to 25% for those aged 25–34 ^[74]. Currently, more than 40 nations still do not have legislation to protect domestic violence against women. More than 700 million women and girls were forced to marry before the age of 18, and it is calculated that more than 200 million girls and women worldwide have undergone some form of female genital mutilation (FGM). Three out of four victims of human trafficking are girls and women ^{[74][75]}. About 15 million school-age girls are not in school. Similarly, in 18 countries around the world, husbands can legally prevent their wives from working, and in 39 countries, inheritance rights are not equal for sons and daughters ^[74].

The European Union (EU) Gender Equality Database shows that the pay and pension gap in the European Union (EU) has not narrowed ^[76]. All this indicates that gender inequalities are still present in most countries. The COVID-19 pandemic has impacted all countries in the world, putting a great strain on the economy and the healthcare system, as much as it has contributed to maintaining this gender inequality. In approximately 18 countries, it is calculated that women carry the strain of being responsible for household and family care because of the measures taken to prevent COVID-19 ^[77]. As a result of school and daycare closures, some mothers have been forced to quit their jobs or try to combine jobs to stay at home and care for their children. If they have managed to work at home, they will certainly have had to cope with the stress of multitasking, which can affect their physical and mental health. It should be noted that grandmothers have also provided a great deal of help, often at risk to their own health, through exposure to the virus ^[78]. Organizations in Central Asia and Eastern Europe have urged policy makers and the international community to recognize the risks that the pandemic could have on women, potentially a setback to women's rights if adequate answers and recovery plans are not urgently launched ^{[75][79]}.

Likewise, in relation to violence against women, throughout the pandemic and especially during quarantines, many women have had no choice but to endure their abusive partners, within their homes ^[80]. On 6 April 2020, UN Secretary General António Guterres alerted the world to the potential increase in domestic violence during quarantines, which threatened SDGS 5, especially focusing on the ending of all violence against all girls and women. Some nations, like the United Kingdom and China, reported that domestic violence doubled during the shutdown period of COVID-19, from February to April 2020, in comparison to the same time period of the year before ^[81]. Similarly, the Italian National Network of Women's Centers recorded a sharp increase (around 74.5%) in the cases of women contacting the centers during this period of COVID-19 ^[78]. Belizzi et al. ^[82] have stated that "COVID-19 and violence against women are interrelated pandemics". These authors ^[83] state that the COVID-19 restrictions have also led to "significant delays in programs to end female genital mutilation (FGM), which could result in an estimated 2 million more cases of FGM over the next decade and an estimated 31 million more cases of gender-based violence and 13 million more child marriages over the next 10 years ^[79]".

A UN Women's poll ^[84] analyzed the effects of the COVID-19 pandemic on SDGS 5 in 11 Asia-Pacific countries. The findings noted that "women's economic resources are the most affected". The report also noted that women's emotional and mental health has been disproportionately affected during the pandemic. The data also noted that women's pay has decreased due to reduced hours. The survey also noted that curfews have jeopardized women's security and that "institutional responses are inadequate". Therefore, the major conclusion is that the pandemic has jeopardized the achievement of SDGS 5 in the Asia-Pacific region ^{[79][85]}.

As has been the case in previous pandemics, the gender impact is being ignored—with exceptions—in global and national solutions to the COVID-19 crisis ^[86]. To avoid this, the EU should (beyond urging Member States to implement a gender approach to COVID-19) re-evaluate how the Gender Equality Strategy for the next five years will be implemented in this context and seek alternatives over the next five years, along with alternative binding formulas in the face of the refusal of some Member States to sign up to the Istanbul Convention on violence against women. This Istanbul Convention on combating gender-based violence deals with an issue that is likely to be key in this crisis. The leadership of the countries most committed to gender equality will also be essential if Goal 5 of the SDGSs is to be sustained and improved in the coming years of crisis ^[87].

5. Sustainable Cities, Communities, and Climate Action

Cities are the direct expression of society. They are essential scenarios for mobilizing the actions of humanity, becoming the urban space where innovation, development, creativity and, above all, innovative technologies converge ^[88]. It is

estimated that by 2030 cities will have 5 billion inhabitants and that by 2050 about two-thirds of the world's population will live in them. As COVID-19 continues to hit the economy hard around the world, researchers must begin to look for other sustainable ways to sustain our planet. However, banishing poverty and inequality, expanding health care, or reversing biodiversity loss, as well as climate change, may not be possible due to lack of money or attention [89]. Because of the financial situation and socio-environmental COVID-19 effects, the transition to sustainable and resilient cities has been questioned. Likewise, as COVID-19 has affected the strategies of different governments, the urgent need to improve all those issues that characterize urban agendas has been pointed out, in order to achieve sustainability and be resilient to the effects of the global ecosystem crisis. This will require the overcoming of urban research and the design and implementation of public policies that address the various socio-environmental problems generated within cities before, during and after COVID-19 [90].

Throughout history, pandemics and epidemics have had an important role to play. The development of playgrounds, squares and walking areas in European cities could be considered as the first means of providing safer urban spaces. These public spaces in cities are the places where people congregate and interact [91]. These spaces throughout the pandemic may have been avoided, for fear of contagion, making the post-pandemic city less convivial. History has shown that pandemics can help change the layout of cities and build safer environments. However [92][93], the current layout of contemporary cities developed after forgetting the impact of previous pandemics. In recent years, the emphasis has been on densely populated urban spaces. However, in the new normal, post-pandemic, there will be the need for further development of the health and safety effects of urban public spaces. However, it is necessary to redesign cities in a society where pandemics may be more frequent because of globalization and climatic change [94][95][96].

COVID-19 and climate change disproportionately affect the most disadvantaged populations, intensifying global inequalities [97]. The current pandemic has highlighted the fragility of our globalized society, raising concerns about the sustainability of our way of life [98]. Research has presented the implications of COVID-19 in multiple areas, such as energy and the environment [99]. The pros and cons of the pandemic changes have been outlined, focusing on the impact of the SDGSs related to energy and the environment. The results point to a positive impact on sustainable and clean energy and a negative impact on climate action [100]. However, some research suggests that less traffic and a less hectic pace of life, as well as cleaner air and more responsible food consumption are considered positive side effects of confinement policies [101]. This may indicate that there are opportunities to adjust behavioral responses that could serve as positive measures of low-carbon emissions. It is also noted that society is aware of the need for a response to climate change that mirrors the need for our response to the pandemic [102].

In the short term, the pandemic minimized pollution in all countries of the world, especially in China, Europe, and the USA, where carbon dioxide (CO₂) and nitrogen dioxide (NO₂) emissions were significantly reduced. Thus, inadvertently, COVID 19 minimized emissions more than any other intervention or policy proposal to date, in line with the targets of the Sustainable Development Goal for Climate Action, which proposes to keep warming below 1.5 °C above pre-industrial levels [103]. However, this situation may not be sustainable in the future, as the economic slowdown could pose much greater problems. Nevertheless, the pandemic has illustrated that there may be opportunities to implement structural changes along climate-friendly pathways. Therefore, these actions would have to represent permanent and major fundamental changes in energy institutions, economics and transportation. During the pandemic, given the low demand for energy because of the restrictions that forced the shutdown of services and industry, aided by one of the best spring climates in the country's history, sufficient solar and wind power could be generated, achieving a full month without coal-fired electricity consumption [104]. Despite doubts about the global climate crisis in the post-COVID future, the pandemic has helped people realize that the oil and coal industries are permeable systems. Therefore, there is an opportunity to change the system and push policies towards renewable energy projects that will help growth and create jobs while reducing emissions [105].

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