MDPI English Writing Prize 2020

Subjects: Linguistics

Contributor: Catherine Yang

The MDPI Writing Prize is an annual award supported by MDPI Author Services, which provides services including language editing, reformatting, plagiarism checks. The winners of the 2020 MDPI Writing Prize about the theme “My work and the United Nations Sustainable Development Goals” are posted on Encyclopedia. In this competition, we received many excellent submissions from entrants who shared their inspirational and thought-provoking work.

English Writing

1. Introduction

Good communication is fundamental to scientific research. With over 20 years’ experience in publishing and research communication, MDPI understands how crucial good writing is. For this reason, we have held the annual MDPI Writing Prize since 2018. It aims to promote clear, high-quality prose that powerfully communicates key scientific concepts.

2. About the Organizer

MDPI (www.mdpi.com) is a publisher of over 200 scholarly open access journals covering all disciplines. It also offers author services, including English editing, to academic authors (https://www.mdpi.com/authors/english). MDPI aims to support the rapid communication of the latest research through journals, conferences, and other services to the research community.

3. Target User

The competition is open to non-native English speakers who are Ph.D. students or postdoctoral fellows at a research institute.

4. About Awards

Essays of up to 1000 words are invited on the following topic:

“My work and the United Nations Sustainable Development Goals”

1st prize (one winner): 500 CHF and certificate

2nd prizes (two winners): 250 CHF and certificate

3rd prizes (three winners): 100 CHF and certificate

Submissions should be made via email to englishediting@mdpi.com with the subject line “MDPI writing prize 2020”. Entries will be judged by the MDPI English Editing Department and evaluated on grammar and spelling, content and overall presentation.

5. Winning Prize

Entries for MDPI writing prize 2020 will be listed below.

5.1. From Local to a Universal Commitment to Achieve the United Nations Sustainable Development Goals

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Once I start doing research I knew that the main goal was to make things done better. As a young environmental and health sociologist, believing in a more balanced and fair world, the motivation that triggered the passion for research has started since I contacted with the 2030 Agenda [1]. This ambitious and truly inspiring document contains the most powerful message: no one lefts behind. This mote has been, since them, side by side with my research goals and targets. Working in the field of environmental and health justice, namely in the urban green spaces fairly provision across all social groups, independently of their socioeconomic, cultural and ethnic background, is a small step to contribute to the UN 2030 Agenda. More than never, in a world experiencing socioenvironmental challenges, that gain more expression in urban spaces, urban green spaces research should be more intense and based on transdisciplinary approaches. The classic methods and techniques no longer make sense, once the potential to analyse the complex interaction between ecological and social systems is reduced. It is time to develop innovative approaches, to combine different perspectives and methods to be able to pursue this ambitious agenda that represents a global commitment towards a more fair and sustainable world. Urban green spaces are an essential part of SDG 11 [2], thus it is necessary to deeply understand what users feel, believe and expect from these spaces. The current scientific evidence states that these spaces are not fairly distributed within the cities: disadvantage communities are more likely to have less access to urban green spaces with quality than the wealthier ones [3,4]. This is a clear example of an environmental injustice issue that compromises the physical and mental health of these communities, and that does not lead the opportunity to promote social cohesion and empowered public open spaces [5–7]. Within this background, my research aims to contribute to a deep understanding of these dynamics, namely in the city of Porto, a coastal city in the north of Portugal. Many studies have assessed the ecosystem services potential in the urban green spaces of the city, and the conclusions are

clear: urban green spaces ecosystem service potential differs from the city area and this relation is mediated by the socioeconomic and environmental vulnerability variables [4,8–10]. These results are extremely important to highlight this complex issue, but something is missing in these approaches, and that is the peoples' voice. My work aims to fill this gap, to contribute with people perception about the urban green spaces that they visit, about its preferences, motivations and expectations. Science should be made to improve people life and in this case, urban green spaces interventions should fulfil the users, and potential users, expectations. Alongside, this research applies an innovative technique called behavioural mapping [11]. Behavioural mapping joins direct observation and practices mapping, which is a powerful combination to identify patterns of peoples habits, practices and behaviours concerning space. This small contribution from a local city in a small country of the western part of Europe intends to be a "puzzle piece" towards global commitment that we all have been called to assume. At the present, the well know saying "Thing global, acting local" is more comprehensive than never. Small actions can make big things and this should be the mindset. The United Sustainable Development Goals are more than just a vague and political document. It is undeniable that this agenda has changed the way we do science, the way that we publish and write, and, more importantly, the way that we think.

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5.2. Microinsurance Sustainable Development Goals (SDGs)

Author: José Miguel Flores Contro

Microinsurance is a type of *insurance* that is focused on protecting low-income people against specific risks in exchange for paying a *premium* that is calculated according to the likelihood and cost of the insured risk. This essay explains how *microinsurance* could be helpful in reaching some of the United Nation's Sustainable Development Goals (SDGs).

How Can Microinsurance Help Attain United Nation's Sustainable Development Goals?

The Role of Microinsurance in the 2030 Agenda for Sustainable Development

On September 25 2015, the United Nations (UN) published the 2030 Agenda for Sustainable Development whose main purpose is to give an action plan for people, planet and prosperity. Moreover, it seeks to build societies which are free from fear and violence by promoting a culture of peace [1] . The Agenda was built on eight Millennium Development Goals (MDGs), which comprise a development framework that was established by world leaders at the beginning of the new millennium [2]. By recognizing the MDGs were not fully achieved, the Agenda presents a new set of seventeen Sustainable Development Goals (SDGs) and 169 targets that replace the MDGs [3]. Figure 1 shows the transition from the original MDGs to the new SDGs.

Figure 1: Transition from the original MDGs to the new SDGs. Obtained from [3] and [4].

As a second year Ph.D. student at the University of Lausanne in the Department of Actuarial Science (DSA), my research work is mainly focused on *microinsurance* (also known as *inclusive insurance*).

There have been multiple attempts to find the most suitable definition for *microinsurance*. For instance, [5] presents a detailed list with different definitions. In general, we could say that *microinsurance* is a type of *insurance* that is focused on protecting low-income people against specific risks in exchange for paying a *premium* that is calculated according to the likelihood and cost of the insured risk. At first sight, it might be hard to find the differences between *microinsurance* and traditional *insurance*. However, once you get more involved in the study of these fields, it is easy to come up with many dissimilarities between the two. In my opinion, even though both sectors work under the same principles, they need to be studied separately. The fundamental basis of *microinsurance* lies in the fact that its target market are low-income populations. Consequently, theories of traditional *insurance* may not apply. For example, nowadays people are used to paying high *premiums* for protecting themselves against specific risks. Indeed, how many of us have paid a huge amount of money for some type of *insurance*? I would bet that most of us have. Expecting customers to pay high *premiums* for a *microinsurance* product is inadequate. Certainly, not only could charging high *premiums* lead to the failure of a *microinsurance* product but there are many other factors to be considered. In particular, some researchers have studied the main factors affecting *microinsurance* demand [6] . Table 1 gives a brief overview of the sign of determination (*positive* or *negative* relationship) of these factors with *microinsurance* take-up.

Variables	**Sign of Determination**	
	Positive	*Negative*
Economic Factors		
Price of Insurance (including transaction costs)		✓
Wealth (access to credit/liquidity) and Income	✓	
Social & Cultural Factors		

Risk Aversion		✓
Non-performance and Basis Risk		✓
Trust and Peer Effects	✓	
Religion/Fatalism	✓	✓
Financial Literacy	✓	
Structural Factors		
Informal Risk Sharing	✓	✓
Quality of Service	✓	
Risk Exposure	✓	
Personal & Demographic Factors		
Age	✓	✓
Gender	✓	✓

Table 1: Determinants of microinsurance demand [6]. The most common sign of determination is shown.

It is challenging to determine an appropriate design for a *microinsurance* product since it needs to fit some of the target population's characteristics including religious beliefs, level of education and risk exposure, among others. It is not yet clear which approach to use in the design and introduction of a new *microinsurance* product in a particular territory. Hence, further investigation needs to be done. In fact, some researchers have even questioned whether *microinsurance* overall is a helpful safety net for low-income populations [7]. Despite these statements, while it may appear redundant, I am convinced that a well designed *microinsurance* product is assured of a great future.

So far we have only defined *microinsurance* and discussed some of the challenges this sector might encounter. The question lies in how this "special" type of *insurance* could help achieving the SDGs. In fact, there is not a clear answer for this question. However, there have been several studies that have attempted to provide an answer. For instance, two examples are [3] and [8]. Figure 2 displays *microinsurance* as a primary and secondary factor in reaching eleven of the SDGs.

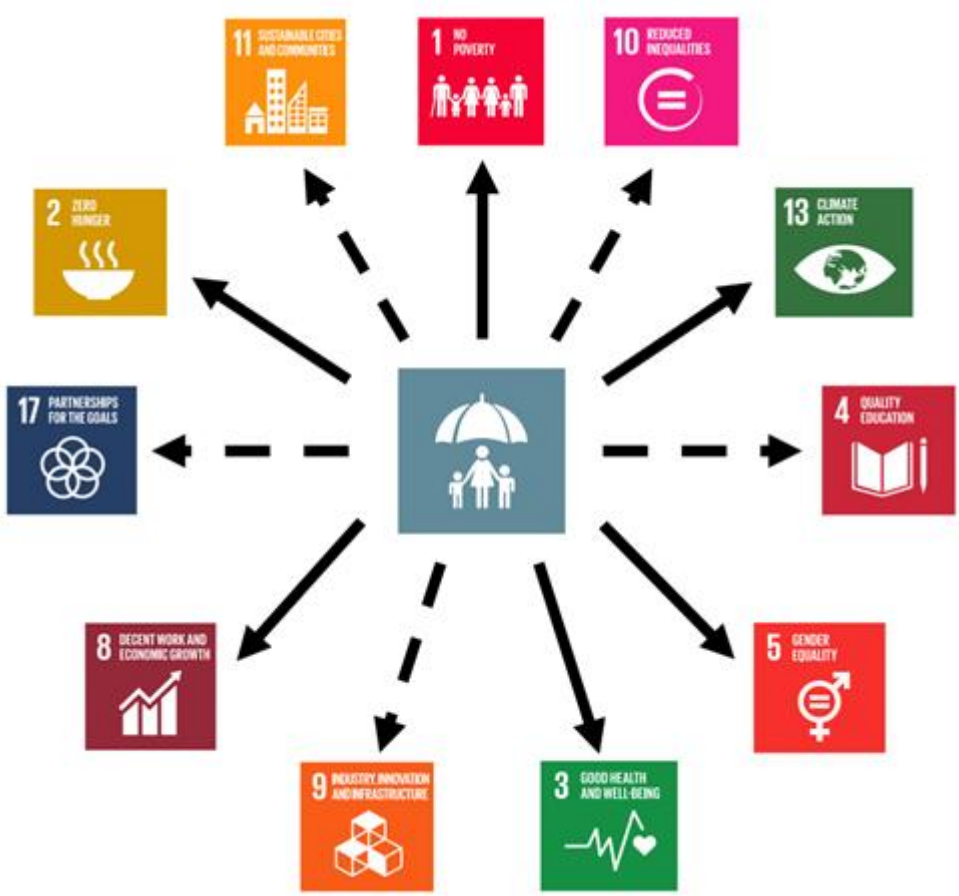

Figure 2: *Microinsurance* as a primary (solid) and secondary (dashed) contributor to the SDGs.

Some of the links shown in Figure 2 are easy to guess. For example, *microinsurance* works as a shock absorber against risks and therefore minimizes the losses a family might face due to the occurrence of an unfortunate event,

protecting them from falling below the poverty line. Thus, it is clear how *microinsurance* helps in the reduction of poverty (SDG 1). In addition, this example also illustrates how this type of *insurance* could also be helpful in eradicating hunger (SDG 2) since a *microinsurance* coverage stabilizes households' income and consequently improves food security. On the other hand, some other links might be hard to determine. For instance, one might wonder how *microinsurance* can help improve the quality of education (SDG 4). Actually, it could be a key factor in reaching this goal. For example, let's consider the unfortunate event in which the breadwinner of a family dies. In this scenario, one can assume that a plausible solution would be to overcome the economic difficulties resulting from this event by reducing the family's expenses related to child education. Consequently, in most of the cases, the quality of education is also reduced. A life *microinsurance* policy for the breadwinner could have prevented this. Just as for these three SDGs, we could also find the primary or secondary link between *microinsurance* and the other SDGs shown in Figure 2.

The main goal of this essay is to give a brief introduction to the concept of *microinsurance* and to explain how it could be helpful in reaching some of the SDGs. Furthermore, we have discussed some of the main challenges this industry might encounter and highlighted the fact that there is still more to be done in order to build successful *microinsurance* schemes. I feel privileged to be part of the research on the *microinsurance* industry. I look forward to completing my studies as a Ph.D. student so that I can be part of the successful implementation of *microinsurance* schemes which will achieve the attainment of the SDGs.

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5.3. AMR and Sustainable Development Goals

Author: Márió Gajdács

The discovery and subsequent clinical use of antibiotics may be considered as one of the „game-changing” achievements in medicine, revolutionizing the care of patients, who would have previously succumbed to the

onslaught of deadly bacterial infections. Since the 1950s, antibiotics have saved millions of lives and they have allowed for the development of complex surgical interventions, organ transplantation, neonatal care and the safe therapy of cancer patients. However, the emergence of bacteria resistant to these drugs has proven to be one of the most serious concerns of the millennia. Multidrug-resistant (MDR) bacteria are usually defined as bacteria resistant to three of more different antibiotic groups; these microorganisms can withstand previously lethal doses of antibiotics. Infections caused by these pathogens are associated with worse clinical outcomes, longer hospital stays, excess mortality in the affected patients and an increasing burden and costs on the healthcare infrastructure.

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Two phenomena have been identified as the main driving forces behind the clinical problem of antibacterial resistance: on one hand, the imprudent use of these agents in human medicine (including overuse and misuse), which facilitates the development of resistance in bacteria (this is why these drugs are often termed "social medicines", because the misuse by one person affect the efficacy of these drugs for society as a whole); on the other hand, pharmaceutical companies are turning away from the development of novel antimicrobial drugs, due to the difficulties in drug development, the lack of returning financial investments and the inevitable development of resistant strains. Additionally, the use of antibiotic in animal husbandry (both as preventative medication and as growth promoters) and in the food industry must also be mentioned: globally, around 70-80% of antibiotics-consumption is attributed to these industries. Based on their overall clinical impact and significance, the so-called "ESKAPE" pathogens (E: *Enterococcus faecium*, S: *Staphylococcus aureus* or recently *Stenotrophomonas maltophilia*, K: *Klebsiella pneumoniae* or recently C: *Clostridioides difficile*, A: *Acinetobacter baumannii*, P: *Pseudomonas aeruginosa*, E: *Enterobacter* spp., orrecently *Enterobacteriaceae*) receive the most attention, both from public health authorities and from drug development agencies. It has been suggested that the issue of antibiotic resistance needs to be addressed using the One Health approach, during which interdisciplinary interventions should be designed and implemented.

According to the projections of the European Centers for Disease Prevention and Control (ECDC) MDR bacteria are responsible for over 400,000 infections and 25,000 excess deaths annually, while the US Centers for Disease Control (CDC) projects over two million MDR infections and 23,000 excess deaths per year. The World Economic Forum (WEF) has compared the insidious nature of the resistance problem to that of climate change. The O'Neill Report – sequestered by the UK National Health Service – projected the worse outcome, namely over 10 million

excess deaths and financial costs of 100 billion US dollars associated with drug resistance by 2050. Several international declarations have been published for government stakeholders around the globe to take action. The concern for antibiotic resistance has been highlighted by the fact that the issue has been discussed by the United Nations (UN) General Assembly; this was only the fourth time a health-related issue has even been considered by the UN.

The Sustainable Development Goals (SDGs) were defined in 2015 by the UN to serve as a global blueprint for a better, more equitable, more sustainable life on our planet; the initiative includes 17 well-defined goals from the fields of ecology, climate change, societal issues, economy, education and healthcare – that are frequently interlinked – with well-defined actions, targets and monitoring criteria to allow for the evaluation of the progress of these goals. The deadline for attaining most of the SDGs has been set in the year 2030, however, other do not have a specific deadline. Unsurprisingly, increasing levels of antimicrobial resistance threaten the attainment of the SDGs as this phenomenon considerably influences changes in society and healthcare. Among other things, antibiotic resistance may limit Goal 1 (No Poverty) and 2 (Zero Hunger): as food production is expected to grow by 50-70% in the time-frame between 2010-2030, and so will the need for antibiotics in this industry. Resistant bacteria threaten long-term food security, in addition, they may lead to the demise of the economic prospects of the farmers (see Goal 8: Decent Work and Economic Growth); the same thing may be said for people experiencing adverse outcomes after MDR infections, which may affect their opportunities to be employed. People living in poverty are generally more vulnerable to infectious diseases and to be affected by drug resistant bacteria; these patients often do not have the means to obtain some of the more expensive medications. It may be said that antibiotic resistance can directly worsen societal inequalities (Goal 1 and Goal 10: Reduce Inequalities). Conversely, implementation of Goal 6 (Clean Water and Sanitation) will hopefully curb the need for antibiotics by reducing the prevalence of several infections transmitted by contaminated water, and it also reduce the spread of resistant bacteria (e.g., from hospitals or animal farms).

Antibiotics should be considered important hallmarks of present-day medicine; thus, it is unsurprising that the Goal 3 (Good Health and Well-Being for All at All Ages) will never be achieved if the disadvantageous developments in resistance and the associated excess death toll are not addressed. From the standpoint of prudent antibiotic use and antimicrobial stewardship, the Goal 12 (Responsible Consumption and Production) may be relevant. To monitor the impact of antibiotic resistance and to track the progress of specific interventions – in the context of SDGs – an important issue that needs to be solved is the development of a specific indicator. As previously mentioned, most of SDGs have clearly-defined performance indicators and specific actions to attain the goal set. Some suggest that ensuring universal health coverage globally would widen the scope of visibility for sustainable development. The more one assesses the importance having effective antibiotics available, the inter-relatedness of resistance and the SDGs becomes more apparent; these common points should be highlighted for stakeholders to facilitate the fight against antibiotic resistance to be taken on the national agendas.

Keywords: antibiotic resistance; sustainable development goals; SDG; AMR

5.4. Minding the gap

Minding the gap in times of a pandemic

Author: Joris Van Doorsselaere

Purposeless, irrelevant, uninspired, isolated … Just some of the thoughts and words that went through my mind during the past month. Inspiration seems to be in lockdown as well. What a moment to start a new research project.

September began quite all right. The transition from a full-time history teacher to one with a half-time engagement went well. In October, a new exciting challenge awaited at Ghent University, to conduct practice-based research on heritage education. However, by the end of the month, the pandemic crisis hit Belgium hard again. Infections were rising, and the hospitals gradually became overcrowded. Luckily, the schools stayed open, and my colleagues and pupils provided sufficient social interaction.

Nevertheless, the University switched to code red. Working from home on my research was required, alternated with some social contact at school. Unfortunately, infections kept climbing. By the end of October, the government decided to close down the schools entirely for the first two weeks of November, followed by distance learning until further notice. Social contact was limited once again. So, the virus took away the opportunity to meet my new colleagues in person. The feeling of total confinement during March and April, while I was investigating intangible cultural heritage at the Free University of Brussels, slowly came back. A perspective on rebooting schools and universities remains unclear. Most likely in February, according to a fairly straightforward statement.

When reading on heritage education, I stumbled upon the special issue of Sustainability. My mind digressed, and I found myself clicking a page about an English Writing Prize. Maybe this helps to write away discouragement? Anything that can pass for a comfortable alternative to formal academic writing. Luckily, linking my work on heritage education to the Sustainable Development Goals doesn’t pose much of a challenge. Making it interesting maybe will.

I have been working as a secondary school teacher for almost ten years now. However, to be honest, the sustainable development goals, which came into effect in January 2016, were relatively unknown to me during recent years. The United Nations developed seventeen global goals and divided them into 169 targets. Even the ambitions for education were captured in a specific plan. But it must have been in September 2019, when I was outlining my research design on the 2003 UNESCO Convention on the Safeguarding for Intangible Heritage in Flanders, when I first heard of Agenda 2030. Rather shameful for a school teacher who considers himself to be usually well-informed on upcoming educational matters. How could I miss the launch of this global and ambitious framework, which appears to be relevant to me professionally? Or was something else to blame?

Over the course of the last months, Agenda 2030 slowly became more transparent. Nevertheless, I gradually realized there might be a problem with the framework itself. As a secondary school teacher active as a researcher

on the SDGs and its relation to heritage education, I never felt truly connected with the mixture of goals and targets. When investigating them, they appeared to be very distant and unrealistic to me. Although culture was conceived as a driver and enabler of sustainable development, much of this mostly remains on paper. The presence of heritage aspects, or culture in general, is minimal. And as a teacher, the goals and targets feel like they are continually floating above my head but never seem to land. The implementation lags behind. With roughly ten years to go, world leaders at the SDG summit in 2019 called for a Decade of Action.

To join in on this action, I can say my research design would fit right into it. In an attempt to close the gap between theory and classroom practice in the field of heritage and history education, I set up a participatory action research project. The main aim is to investigate didactic tools that came about in an academic context and see how they would function in a real-life secondary school setting. Learning about heritage not only happens in formal learning situations. In most cases, it depends on the local environment. Therefore, I hope to develop ways to establish sustainable connections between schools and the local context in which they are embedded. In the case of heritage education, formal and informal partners are essential in achieving common goals. In this way, the last sustainable development goal on partnership proves to be the most relevant for my research.

To end on a positive note during this pandemic, I want to share something else I just recently found out. When I was walking in the hallway of the secondary school a few months ago, I noticed a banner for the first time. It mentioned the UNESCO concept of Lifelong Learning, contained in a word cloud. It has been there the whole time, but it recently drew my attention due to my research on the 2003 UNESCO Convention. The concept has come a long way since 1972, when it first appeared in the thoughts and texts of UNESCO. Over the course of the past decades, the international concept made its way into SDG 4, but apparently down to the lowest levels on various banners as well. Does this mean that Lifelong Learning also reached the minds of pupils, students, parents, and teachers in Flanders? Maybe this could be the premise of a new research project on its implementation? For now, I wanted to show that gaps between theory and practice can grow closer; they just need some time and belief.

A banner on the SDGs is not yet present in the hallway of my school. Or maybe I just haven’t noticed it?

Keywords: sustainable development goals; education; flanders

5.5. The FoodSmartphone project fosters well-being through innovation

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When asking scientists what the goal of science is, different answers will be given. One might answer it is to unravel the mysteries of the physical world. Another could say that it is to answer the highest questions of existence. Someone else could argue that science is all those in parallel. Nonetheless, no matter what the answer

is, science should act for the wider public's benefit and try to give everyone an opportunity for a better life, when relevant.

As a scientific tool, research can be used to determine the causes and solutions to challenges in life while promoting information among the scientific community and citizens. Most importantly, research can support critical decision making from policymakers in life-saving situations for human's protection through innovation. Seven years ago, at the United Nations Conference on Sustainable Development, in Rio de Janeiro, Brazil, those policymakers laid the foundations in a plan to improve everyone's lives and prospects, with the 17 sustainable development goals (SDG) acting as the compass. As described in SDG 17, the whole SDGs' plan calls for engagement and contribution from all parties and communities, from citizens to policymakers, and from investors to sectoral experts and entrepreneurs. The scientific community can work along with those goals to provide higher impact opportunities to the broader public. SDG 3; to "Ensure healthy lives and promote well-being for all ages," targets, among others, to reduce the mortality rate attributed to unintentional poisoning. This SDG 3 sub-target can be achieved by minimizing human exposure to hazardous substances and food contaminants that risk their health, as well as a timely public warning. Moreover, SDG 9, relevant to "industry, innovation, and infrastructure," aims at endorsing scientific research and promote innovation while upgrading industrial processes [1]. These two goals are highly relevant and overlap with the scientific research conducted in the FoodSmartphone project.

FoodSmartphone project is a Marie Skłodowska-Curie actions program, funded by the European Union, aiming at creating more innovative and straightforward methods to detect food contaminants. Food contaminants are substances not intentionally added to food and are related to risks for consumers' health. This contamination might happen in every step of the food production and distribution line, thus jeopardizing consumers' safety [2]. As we all know, in our everyday life, to ensure our well-being, we should keep away from every health-related risk. However, what happens when we keep our distance, but the risk comes hiding straight to our plate, in every bite of crunchy cereal we eat for breakfast, or in our glass, in every sip of the refreshing beer we drink in our night out? Those risks' name is mycotoxins, which are naturally occurring toxins produced in fungi infected cereals as products of their secondary metabolism. Their toxic effects might vary depending on the type of mycotoxin, and food commodity, ranging from diarrhoea, abdominal pain, vomiting, or even death in acute toxins' poisoning. Mycotoxins are often contaminants of cereal grains and products thereof, decreasing food quality and safety. It is estimated that 500 million people from developing countries, among which 160 million underaged children, are exposed to natural toxins. Moreover, mycotoxin's occurrence is a burden not only for human health but also for the economy, as the industrial and agricultural sectors lose millions of dollars each year, as mycotoxins infect 25% of crop production. For all these reasons, mycotoxins' early detection is of great importance [3]. Until today, plenty of techniques for mycotoxin detection have been developed. However, everything happens fast in the modern speedy world, from cereals' production to the market distribution and consumers' consumption. To recuperate from the market's high demands, faster and more accurate mycotoxins safety monitoring is needed.

In this research as part of the FoodSmartphone project, we aimed to combine two already well-known and used advanced techniques, namely an immunoassay and mass spectrometry, to consider things from a different and innovative look to effectively, accurately, and quickly monitor mycotoxins' occurrence. As it is said, "Innovation is

taking two things that already exist and putting them together in a new way," and that is precisely what is happening in the FoodSmartphone research. As a proof of concept for developing the technique, the mycotoxin deoxynivalenol (DON) was used. At first, a bioassay, namely a lateral flow immunoassay, is performed. The bioassay is an easily performed technique that gives a positive or negative readout that can be read using a smartphone, depending on the presence or absence of DON from the food sample, respectively. When the first screening result is positive, a supplementary identification lateral flow immunoassay (ID-LFIA) is performed. This ID-LFIA can isolate the mycotoxin under investigation, which later is dissociated and isolated to be analyzed with two different mass spectrometric (MS) techniques. The biorecognition element of antibodies on the ID-LFIA adds to the specificity of the technique. The MS identification that follows adds to the detection's overall accuracy, leading to optimum food safety monitoring. The real challenge of such a combination lies in the two techniques' incompatibility, as the solutions used in the first hamper the detection in the second. However, the successful optimization of the detection parameters allows those two techniques to act complimentary. This output offers fast and secure food safety protocol to detect mycotoxins, and it enables us to provide safer food faster in the market and benefit everyone with non-hazardous alimentation choices [4].

Innovation goes hand in hand with a challenge, and well-being goes hand in hand with safe food options. When we combine innovation for food options, no challenge is left for our well-being. The FoodSmartphone project's innovative technique wishes to minimize the food-related risks, reserve the well-being of billions of people worldwide by providing safer food in the market and support the UN's SDGs to improve the quality of life for everyone.

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5.6. Giant viruses and safe drinking water – present and future concerns

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In 1943, Maslow laid the foundation for classifying human needs. Based on his classification, the non-negotiable physiological human needs of food, water, warmth, and rest are considered fundamental [1]. Seventy-seven years have passed since this theory's emergence, which has undergone additions and discussion, but the basic needs remain the same.

Year 2020, and for many groups of people worldwide, these essential goods remain privileges. Images of young children playing with luxurious amenities, juxtapose with others in muddy streets, looking for food in landfills, and searching for water in polluted bank rivers, still exist both in the developed and developing countries. Many people rely on those muddy waters for their daily water intake, from which giant viruses have been collected, with the first-ever reported just in 2003 [2]. Giant viruses do not differ from all other known viruses because they utilize a host cell for their metabolic processes, resulting in host cell degradation and eventually host cell's death. However, this new class of viruses is characterized by a bigger genome size and a larger number of encoding genes than "traditional viruses." Besides, giant viruses require time-consuming, laborious isolation, and detection techniques as they use a host cell, mostly amoebas, as "pray." Notably, the infection of free-leaving amoebas from giant viruses allows the latter to express a thermo-resistance mechanism and survive and thrive in harsh or in various environments, from water and soil to animals, like sheep, cattle, and rodents to even human's blood and tissue. Lastly, until today, the significant majority of the reported giant viruses have been isolated from *Acanthamoeba* and recently from *Vermamoeba* aquatic-leaving protista, and their preponderance has been collected from metagenomic sewage water samples [3].

United Nations' agenda with the primary targets of transforming our world aims to reduce social inequalities globally by establishing seventeen goals, to be reached by the year 2030. The UN's agenda sixth goal (SDG 6 – target 6.1) focuses on the basic need for clean water and sanitation. Moreover, the third goal (SDG 3 – target 3.9) is to ensure healthy lives by substantially reducing the mortality rate attributed to unsafe water and lack of hygiene. In that line, preserving and reassuring water quality is needed, not only because water consumption is essential for our survival but also because water might act as a carrier for pathogens. Water is an underrated pathway for the proliferation of many fatal diseases' carriers, making its sanitation an essential process before consumption. As with most things, anthropogenic activities are the leading cause of water pollution. Apart from finding ways of improving the quality of water by minimizing those activities, research on the carriers themselves to unveil the mysteries of their genetic material is crucial. In this way, scientists will be prepared for a potential future fight against those pathogens.

As the more recent example of SARS-COV 2 reminded us, viral diseases do not discriminate between race, economic status, nor gender, as they can potentially infect anyone. Likewise, an essential factor of viral "behavior" is the adjustment and the evolution of their genomic composition, which results in the scientific community being temporarily unable to find the treatment for the novel viral strain [4]. Various studies have reported that giant viruses found in water samples can infect human pathogens, some of which have been categorized by the world health organization as important genera to study because of their link with deadly human diseases [5]. Giant

viruses' antibodies have been found in people suffering from community-acquired pneumonia [6]. Besides, viral genomic material was found in human secretions [7]. Despite those pieces of evidence, though, no conclusive link has been established between giant viruses themselves and diseases [8]. All those hints raise the question; What will happen if we ignore giant viruses' presence in some people's daily water intake, assuming they do not pose a threat?

To prepare against a potential future threat from giant viruses, we study their genomic composition, and we compare it with other already well-studied genomes. Faustoviruses and Kaumobavirus are recent *Vermamoeba* isolates under investigation. Using bioinformatics as a tool with comparative genomics approaches, we taxonomized those isolates as relatives of the African Swine Fever Virus (ASFV). ASFV is known to cause high mortality rates in pork livestock, especially in developing sub-Saharan African countries, causing significant economic losses. The new isolates share some common genes with ASFVs; however, they have a unique feature of their major capsid protein size being significantly larger than ASFV. These observations are of high importance as they triggered our interest in monitoring this specific viral clade and understanding the evolutionary path of the viruses of this clade. Additionally, all the new isolates are collected from sewage waters [9], strengthening our concerns about a potential future human threat, i.e., through a similar expression mechanism to waterborne viral disease or even indirectly, i.e., through animal consumption as it has happened with SARS-CoV-2 [4].

As Benjamin Franklin said, "An ounce of prevention is worth a pound of cure." Learning more about giant viruses' genome not only covers scientific curiosity, but it may prevent the emergence of a potential threat to human health. New isolates and their in silico comparative analysis might reveal a potential threat of giant viruses and protect against a potentially harmful risk.

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5.7. Green Engineering for UN SDGs

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Green Chemistry and Engineering to pave our path towards the United Nations Sustainable Development Goals.

Chemical Engineering and Green Chemistry can join their strengths to achieve the United Nation's Sustainable Development Goals by approaching the sustainable production of chemicals, materials and fuels. This entry summarizes the research activities of Dr. Jesús Esteban Serrano to attain greater access to affordable and clean energy, combat climate change and develop more responsible consumption and production processes.

Petrochemicals surround us daily in all types of products and activities being their production the largest driver of oil demand, of which approximately 70% is required by the fuel and chemical sectors. The ongoing growth of energy consumption and a strong dependence on fossil fuels derived from oil, coal and natural gas have led to a continuous escalation of carbon dioxide emissions, which has pernicious effects on climate change and global warming as consequence. Furthermore, the production and consumption of chemicals that pose a hazard to the environment and human health amount to hundreds of megatonnes per year only in the European Union [1].

The current global scenario features the impending exhaustion of fossil resources as well as preserving the health and safety of humans and the environment as major challenges to tackle. For this reason, decision makers have implemented different policies to foster the use of renewable resources for the production of chemicals and the consumption of energy. A significant part of the legal framework passed in the last years regarding a more sustainable production of chemicals and fuels have the Paris Agreement and the United Nations (UN) Sustainable Development Goals (SDGs) as framework. Within this context, we as part of society must contemplate a paradigm shift, which requires a transition to a bioeconomy to make a more sensible use of resources while we search for safer fuels, materials and chemicals.

My research vision aims at this very objective with Green Chemistry and Engineering as the underlying philosophy. The Green Chemistry principles are a series of guidelines to aspire to when designing new chemical processes to improve them from the environmental, health and safety points of view. Among others, these principles include the search for the reduction of waste, less hazardous synthetic procedures, the design of safer chemicals, employing renewable feedstock or the use of catalysis [2].

These principles have implications in the discovery and implementation of new reaction pathways, for which Chemical Reaction Engineering plays a major role. In particular, my endeavours follow a multiscale approach to produce value-added chemicals and fuels starting from renewable substrates, possibly from residual sources that do not compete with food [3]. These studies attempt to understand molecular and phase behaviour, where appropriate in multiphase operations, aided by computational tools. This knowledge is essential to achieve the final objective of designing novel reactor concepts to intensify chemical processes and achieve efficient catalysis. Figure 1 summarizes the pillars of my research activities.

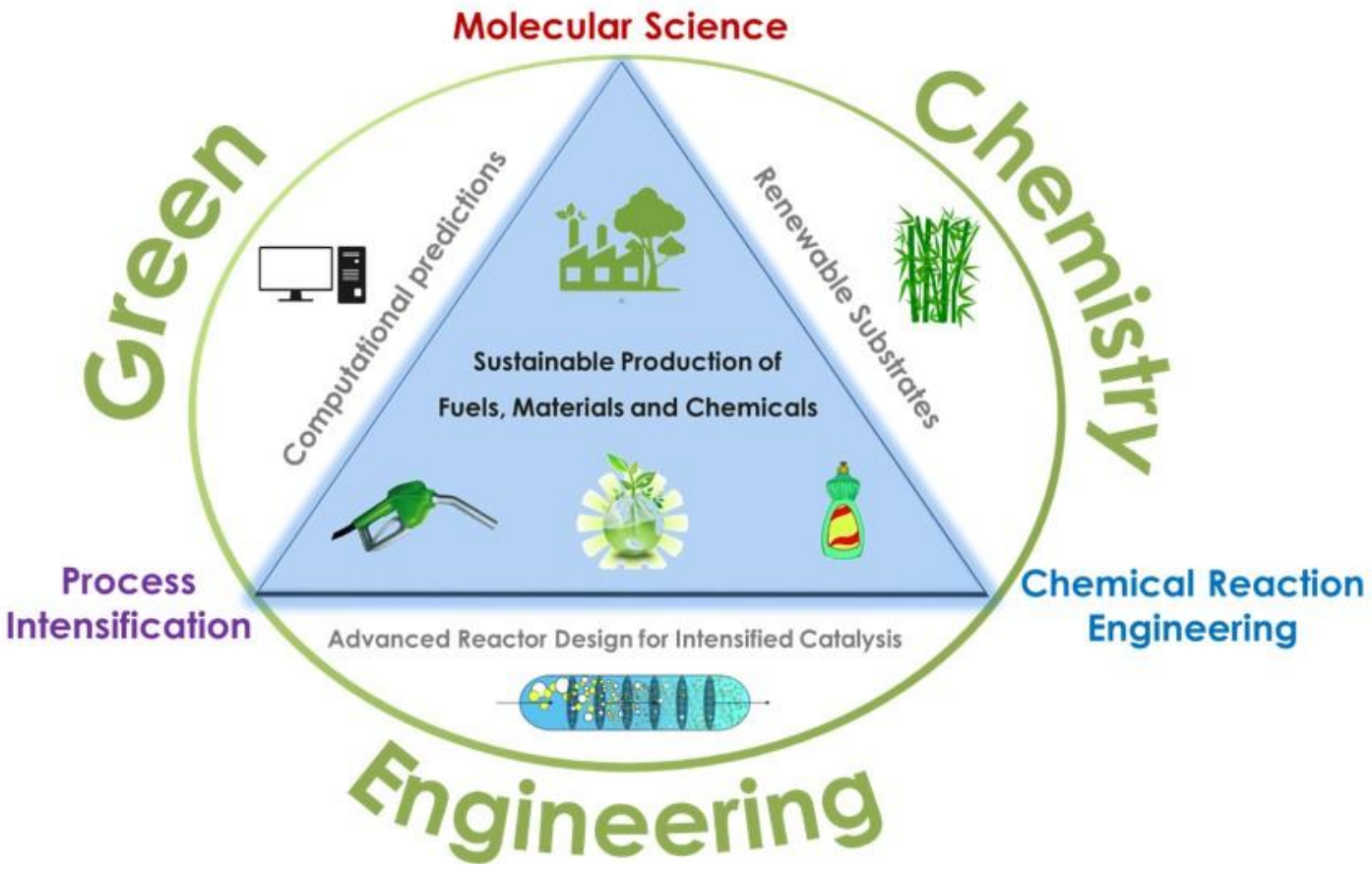

Figure 1. Summarized vision of my research activities to achieve the UN Sustainable Development Goals pertaining the access to clean energy, more responsible production and consumption patterns and action against climate change.

Particularly, during my doctoral degree, I conducted studies on the transformation of glycerol (a by-product of the biodiesel industry) to products like glycerol carbonate [4] and solketal [5], which are highly praised biofuel additives and green solvents. Among other projects undertaken during my postdoctoral stage, I have extended my studies to the valorization of sugars derived from lignocellulosic biomass, which can also lead to different products with application as biofuels or building blocks to biobased polymers [6]. Specifically, my current work focuses on green solvent selection supported by quantum chemical predictive methods to conduct the dehydration of sugars to yield

furans followed by *in situ* separation using biphasic systems [7]. These computational tools allow rapid solvent screening, thus helping to reduce experimental efforts and material expenses. Subsequent work will deal with advanced reactor design to intensify the contact between the existing phases in each case and, therefore, enhance the reaction and separation performance [8].

The examples given above intend to develop processes to obtain biofuels and other chemicals making a responsible use of resources. This way, not only all forms of life in the planet and people can thrive, but prosperity can also be achieved if new business models based on these technologies appear. For these reasons, my research clearly aligns with various UN SDGs, particularly *SDG 7* (access to affordable and clean energy), *SDG 12* (development of responsible consumption and production patterns) and *SDG 13* (action to combat climate change).

Furthermore, adding to the direct relationship of my projects with these goals, my involvement in teaching duties and my international activities as a researcher are undeniably connected to *SDG 4* (quality education) and *SDG 17* (establishment of partnerships for the goals).

My commitment to scientific divulgation has made me participate in different outreach activities at very different levels. For example, I conducted demonstrations for primary and secondary school audiences on the occasion of the International Year of Chemistry (2011) or the Spanish Biotechnology Day (2014), to mention a couple of events. Moreover, I organized workshops on funding opportunities for international mobility of PhD students and postdoctoral researchers in different conferences organized by the National Association of Chemists of Spain, including the World Congress of Chemical Engineering celebrated in Barcelona in October 2017.

Finally, the challenges related to the sustainable production of chemicals transcend borders among nations and requires eventual implementation. This fact makes it critical to exchange knowledge not only beyond borders but also among research institutions, industrial partners and decision makers to establish adequate legal frameworks. In the end, global problems require the global involvement of stakeholders, which in the end highlights the importance of partnership as a key element to achieve the rest of the UN SDGs.

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