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THE IMPACT OF COVID-19 ON THE STATE OF THE ENVIRONMENT IN THE CONTEXT OF THE PRIORITISATION OF NEEDS FOR PURCHASING EVERYDAY PRODUCTS, SUSTAINABLE WASTE MANAGEMENT AND ENVIRONMENTAL AWARENESS

Review paper

Contents

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Abstract

This paper attempts to answer questions related to the impact of the state of the COVID-19 pandemic on consumer behaviour, their hierarchy of needs, the state of environmental awareness, in the context of environmental protection in general and sustainable economy.

The author, when analysing a number of reports on the impact of the pandemic on human behaviour and the environment, exploring scientific sources on consumer behaviour and public sentiment in times of economic crises, seeks to answer the questions of what areas of human life have been most affected by the pandemic and whether the environment will benefit from these changes. In the paper, among others, the following questions are addressed: “Has the temporary halt in all activity associated with lockdown contributed to reflection and behavioural change in the context of the behavioural style of a consumer society?”, “Will the new post-pandemic reality be based on informed sustainable consumer choices?” and “Is the pandemic our salvation in an era of climate catastrophe?”.

By exploring scientific references in the field of consumer behaviour, the author concludes that the social response to pandemic effects and difficult economic events is a predictable mechanism. Supported by analyses of scientific research results on atmospheric CO_2 emissions and statements of experts in the field of environmental protection, as well as consumer behaviour, the author draws the conclusion that after a short-term improvement in the environment caused by the stoppage of the economy, the so-called retaliatory pollution effect may occur, which will significantly worsen the state of the environment compared to the state before the pandemic.

As a purpose of this study, the author constructed his own scenario of a post-pandemic reality in which the value and key to making decisions toward positive change will be in the motor of informed, sustainable economy-based, systemic solutions.

Keywords

ecology, sustainable economy, consumer behaviour, over-consumerism, COVID-19 pandemic, greenhouse gas emissions, environmental protection, economic crisis, climate catastrophe

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Introduction

The COVID-19 pandemic has determined the lives of people all over the world, it has become part of our lives whether we like it or not. Its negative impact on us, our psyche, our environment, our social interactions or our economy will be experienced long after the last inhabitant of our planet has been vaccinated. Significant events in human history, such as pandemics, wars or natural disasters, have significantly altered the course of events, caused a great deal of damage and casualties, but have often also contributed to dynamic development. Each of the industrial revolutions, which initiated enormous technological, economic, social and cultural changes, can be cited as an example. World War I and World War II fostered dynamic technological development and gave rise to new scientific explorations. The pressure resulting from the necessity to solve a problem or find an effective solution quickly becomes a driving force for creativity and resourcefulness. Focusing energy on a single problem gives results much faster than in case when there are many issues to be solved and each problem is characterised by diffuse dynamics and a lack of top-down pressure. It is worth asking whether the COVID-19 pandemic can drive positive change in people's lives and surroundings anyway.

Scientists already say that the great need to invent an antidote for Covid-19 will translate into major advances in the treatment of diseases other than Covid-19[1].

The temporary suspension of all social activity on global scale caused by the pandemic has forced us to rethink and exposed many fears and social anxieties. Evidence proving this fact can be noticed in the increased research of psychologists from many universities, who are studying the impact of the pandemic on thinking, behaviour, relationships or stress levels caused by the state of epidemic emergency[2].

For example, a group of researchers consisting of Maciej Karwowski, D.Sc., Professor of the University of Wrocław, Izabela Lebuda, Ph.D., and Aleksandra Zielińska, M.A., took up the subject of the influence of the pandemic on creative activities in their research paper. It turns out that lockdown can improve creative problem solving. People who thought intensely and talked to others about the consequences of the pandemic were more likely to engage in creative problem solving activities[3].

In turn, a group of researchers at the University of Wroclaw presented in their research that information about a pandemic can have an impact on underestimating the threat posed by COVID-19[4].

1 `L. Borkowski, M. Drąg, A.M. Fal, R. Flisiak, J. Jemielity, J. Krajewski, A. Mastalerz-Migas, A. Matyja, K. Pyrć, P. Rzymski, M. Sutkowski, K. Simon, J. Wysocki, J. Zajkowska, *Szczepienia przeciw COVID-19. Innowacyjne technologie i efektywność*, https://naukaprzeciwpandemii.pl/ [accessed on: 1/03/2021].

2 K. Serafińska, „Przegląd Uniwersytecki On-line" [accessed on: 21/04/2021].

3 M. Karwowski, A. Zielińska, D.M. Jankowska, E. Strutyńska, I. Omelańczuk, I. Lebuda, *Creative Lockdown. A Daily Diary Study of Creative Activity During Pandemics*, https://www.researcher-app.com/paper/6916790.

4 M. Karwowski, A. Groyecka-Bernard, M. Kowal, P. Sorokowski, *Does thinking about coronavirus impact insight and analytical reasoning?*, Uniwersytet Wrocławski.

We jointly participated in the global empathy full of compassion and care when we watched Italians taking coffins to neighbouring municipalities when the crematoria were inefficient, or when in Ecuador corpses were kept in homes or lay in the streets. We felt great solidarity, sewing masks, printing visors on home 3D printers, when doctors in uncomfortable uniforms, with no medical equipment, fought for hours to save every life.

We were suspended in idle mode for the whole global lockdown. As a result of the reduction in business for many industries, we were forced to limit purchases to the most important ones. This also reduced the demand for transport services. Most services were ceased, factories significantly reduced production, the streets, restaurants, pubs, theatres, museums and cinemas became empty. This enforced inactivity, though unpleasant, gave a brief respite to our planet, which is being devastated more and more every year by human over-consumerism. Has the economic downtime and global standstill affected us and the state of our environment in any way? What impact has the pandemic had on the hierarchy of consumer choices?

The premise of this publication is to reflect on and, by delving into various sources, find an answer to the question, “What impact does the COVID-19 pandemic have on the environment and consumer behaviour?”

Possessing beyond the need

The industrial revolution made a leap forward in civilisation. In just 250 years since the beginning of the great transformation of the economy from artisanal to mechanical to digital, human activity has generated a significant amount of CO_2 into the atmosphere. Technological development, to the rhythm of the Moore’s Law, has accelerated in the last quarter of a century, triggering a dynamic consumption of natural resources and thus drastically increasing the demand for fossil fuel consumption. This has a huge impact on man and the environment around him.

Since civilised societies have been developing dynamically, the availability of all goods is no longer a challenge for human. Satisfying basic needs such as food, shelter, hygiene, social contact, culture are no longer a priority. The availability of financial credit opens the way to unreflective acquisition. The result is often the purchase of things we do not need. The dynamics of civilisation changes caused by the rapid progress, in relation to human evolution, caused many undesirable effects in social behaviour. When we stopped controlling the level of consumption of goods and lost rationality in correlating needs with possessions, the problem of excessive consumerism emerged.

Marketing content through various media encourages us to replace products more often whether it is necessary or not. They inform our subconscious that if we don’t have a newer, faster, bigger model,

we are out of the system. This generates in us a state of unfulfillment and lulls us into a feeling of lacking something, while at the same time activating motives aimed at changing this state[5].

So what should we do when everything we have aspired to for centuries as a society has already been achieved, when basic needs have been satisfied and irrational lusts for possessions have taken over instead?

We have stopped thinking about the essence of owning things; they have become freely available. The dynamics of an economy based on GDP growth further exacerbates the problem and contributes to promoting the idea of consumerism. In this way, we have set in motion a self-perpetuating demand mechanism that pays no attention to the environment and its resources around us, heading for disaster. We have put into move a great wheel that can be stopped by a crisis such as a global pandemic, but this involves an awareness of the situation in which we find ourselves and requires an effort that we must make in order to take conscious steps towards change at the right moment.

The new reality

The pandemic reality, referred to by some people as the "new normality", has already penetrated our daily lives for good. Fear for our own safety, limited opportunities and conveniences have revised our needs. We have learnt a new way of communicating with our relatives, we have learnt new skills and, according to the IPSOS survey centre, we have even managed to find ourselves in it and like it[6].

In the challenging conditions of the lockdown, we had the chance to review our lives and the relationships we have with people. We could look at our weaknesses, find our strengths or start a new life. Schools and universities were brutally deprived of the free process of empirical experience and exchange of ideas, which will certainly have an impact on the graduates of most universities. We have learnt that in the acquisition of knowledge everything depends on us, that only our commitment has an impact on our development.

We have been closely following world events. With one eye on our computer screen and the other on the television screen, we could not forget that something extraordinary was happening around us on a global scale. The media were scrupulously reporting the tragic statistics of the victims of COVID-19 every day. Looking at the situation reported by the media and observing the public mood around us, one could feel the anxiety about the situation of a global pandemic.

5 Ż. Ireneusz, A. Brelik, *Wybrane zagadnienia teorii zachowania konsumenta*, „Zeszyty Naukowe Ostrołęckiego Towarzystwa Naukowego", R. 2007, no 21, pp. 207–231.

6 News and surveys of the international market and consultancy company, *Polski konsument w „nowej normalności"*, https://www.ipsos.com/pl-pl/polski-konsument-w-nowej-normalnosci [accessed on: 27/02/2021].

According to the IPSOS research agency, three quarters of the Polish population are worried about the future of the economy after the pandemic. Arkadiusz Sieroń from the University of Wrocław reassured by claiming that due to Poland's low dependence on exports and low economic ties with China we will not be too painfully affected by the economic crisis[7]. Economists from all over the world, however, spin disastrous economic, political and climate visions, which are not directly related to the pandemic. Nouriel Roublin warned in its publication published in the Project Syndicate not only of a human-made climate crisis, but also of a migration crisis caused by its consequences[8].

A pandemic affects ordinary households. We have been forced to change our habits. According to *Nie marnuj jedzenia 2020* report prepared by the Federation of Polish Food Banks[9], 27% of surveyed Poles have changed their grocery shopping habits. The percentage of people who tried not to waste food has increased by 12%, and the percentage of people who planned their shopping in advance has increased by 6%; 82% do their shopping less frequently, nevertheless 52% of people do more shopping than before the pandemic. The report shows that Poles have changed their food wasting habits during the pandemic.

During the Economic Forum in Krynica, the head of the Hungarian National Food Safety Authority reported that an average European throws away more food (92 kg) per year than they weigh. According to a report developed by the Warsaw University of Life Sciences for the Federation of Polish Food Banks, as many as 42% of Polish citizens admit to throwing food away[10]. Globally, one in three food products is thrown away, and this trend is increasing year on year. Wasting food, apart from its financial aspects, brings with it, above all, a moral problem, since the food wasted in the USA, Europe and Great Britain alone could feed over a billion starving people in the world[11].

Pandemic has contributed to popularisation of meals ordered online. According to a survey conducted by ARC Rynek i Opinia[12], During the pandemic, the ordering of meals via the Internet with door-to-door delivery increased by a third, and 40% of Poles do this at least once a week.

7 A. Sieroń, *Czy pandemia COVID-19 spowoduje zapaść globalnej gospodarki?*, „Przegląd Uniwersytecki on-line" [accessed on: 27/02/2021].

8 N. Roubini, Project Syndicate, *The Coming Greater Depression of the 2020s*, https://www.project-syndicate.org/columnist/nouriel-roubini [accessed on: 1/03/2021].

9 Federacja Polskich Banków Żywności, *Nie marnuj jedzenia*, https://bankizywnosci.pl/ponad-53-polakow-przyznaje-ze-zdarza-im-sie-wyrzucic-zywnosc/ [accessed on: 02/03/2021].

10 D. Starzyńska-Rosiecka, *Badanie: 42 proc. Polaków przyznaje, że zdarza im się wyrzucić żywność*, Nauka o Polsce. Portal Ministerstwa Nauki i Szkolnictwa Wyższego, https://naukawpolsce.pap.pl/aktualnosci/news%2C79193%2Cbadanie-42-proc-polakow-przyznaje-ze-zdarza-im-sie-wyrzucic-zywnosc.html [accessed on: 02/03/2021]).

11 https://picm.pl/creditblog/efekt-pandemii-zalamanie-konsumpcji-czyli-szok-popytowy/ [accessed: 2/03/2021].

12 Badanie ARC rynek i opinia przeprowadzone w dniach 3–10 czerwca 2020, próba N=1066, https://arc.com.pl/Polacy-boja-sie-o-dochody-i-ograniczaja-wydatki-blog-pol-1592379333.html [accessed on: 3/03/2021].

As many as 94% of Poles say that shopping for food by delivery is the future, so it can be predicted that this trend will become an everyday occurrence even after the pandemic has passed[13]. Consequently, both the demand for packaging and transport services will increase. It will also be necessary to increase the number of couriers delivering food to customers. The sanitary rigour of food requires the use of plastic packaging that meets anti-viral and anti-bacterial standards. Increasing the amount of packaging will probably increase the amount of packaging waste, of which there is already too much in the environment. According to EuroStat research, total packaging waste increased by 6.7 million tonnes between 2008 and 2018 in the EU. This represents an increase of around 10% compared to previous years. EuroStat also indicates that the most common packaging materials are paper and cardboard (40%), plastics (19%), glass (18.7%), wood (16.1%) and metal (5%)[14].

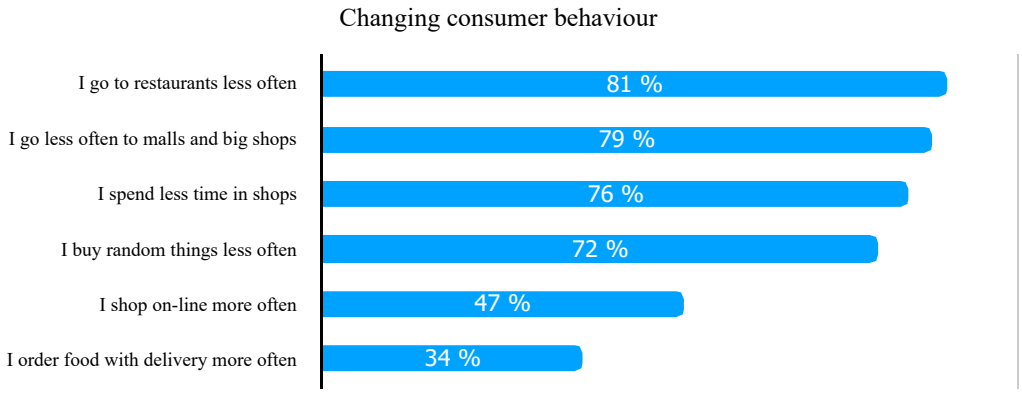

Figure 1. Changing consumer behaviour, data source: ARC rynek i opinia

Producing, packaging, delivering or processing a used product is a very heavy burden on the environment. Industry has to use huge amounts of energy, production material and water to bring us the finished product, and it is this industry that has the most negative impact on the environment, not households, according to some sources[15].

According to *Jak epidemia zmieniła nasz stosunek do ekologii*[16] survey conducted by Ipsos, a half of the Polish population is more afraid of climate effects caused by the pandemic and since the pandemic has started to pay more attention to accurate waste segregation.

13 A. Siwek, POSbistro blog, *Pandemia zwiększyła zapotrzebowanie na dowozy jedzenia, które trwa do teraz!*, https://posbistro.com/blog/pl/pandemia-zwiekszyla-zapotrzebowanie-na-dowozy-jedzenia-ktore-trwa-do-teraz/ [accessed on: 3/03/2021].

14 Badania EuroStat, *Packaging waste statistics*, https://ec.europa.eu/eurostat/statistics-explained/index.php/Packaging_waste_statistics#Waste_generation_by_packaging_material [accessed: 2/03/2021].

15 EPA United States Environmental Protection Agency, *Sources of Greenhouse Gas Emissions*, https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions [accessed on: 2/03/2021].

16 IPSOS, A. Mykowski, *Jak epidemia zmieniła nasz stosunek do ekologii*, https://www.ipsos.com/pl-pl/jak-epidemia-zmienila-nasz-stosunek-do-ekologii [accessed on: 1/03/2021].

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The dynamics of consumer purchases of everyday goods also changed during the pandemic. This is probably due to the fact that most shops were closed due to the restrictions. According to a survey conducted by ARC Rynek i Opinia, 75% of the Polish population have limited their spending on non-food purchases due to anxiety about their income[17]. As many as 40% of those surveyed intend to reduce the number of things they buy, citing lack of need for more, spending time in malls, and the environmental impact of the things they buy and own as reasons.

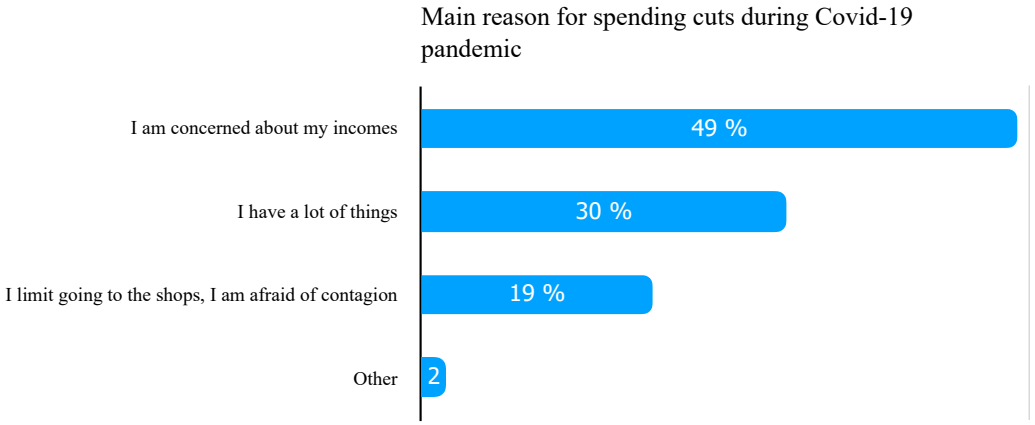

Figure 2. Main reason for spending cuts during Covid-19 pandemic, data source: ARC rynek i opinia

The most important thing, however, is the fact that one in five people say they intend to make more environmentally conscious choices after a pandemic. According to the survey carried out by Ipsos[18], Polish society is concerned about the environmental impact of using masks and shield masks.

When we were confined within the borders of our own countries, the use of transport also declined. We moved less, using cars, and we did not use air transport services for travel. The slowdown in global production has also reduced the need for intercontinental and transoceanic transport. This has probably had a significant impact on overall CO2 emissions into the atmosphere. Measurement stations of the Chief Inspectorate of Environmental Protection, which are located near transit routes, recorded a 30% decrease in pollution caused by road transport[19].

According to the European Environment Agency, transport, despite its key role in the development of society and the economy, is a major source of environmental pollution and climate change[20].

17 Survey conducted by ARC Rynek i Opinia between 3 and 10 June 2020, op. cit.
18 Badanie IPSO, *Polski konsument w czasach koronawirusa*, https://www.ipsos.com/pl-pl/jak-epidemia-zmienila-nasz-stosunek-do-ekologii *9* [accessed: 21/04/2021].
19 Inspekcja Ochrony Środowiska, http://powietrze.gios.gov.pl/pjp/current [accessed: 1/03/2021].
20 Europejska Agencja Środowiska, *Transport*, https://www.eea.europa.eu/pl/themes/transport/intro#:~:text=Jednocze%C5%9Bnie%20transport%20jest%20g%C5%82%C3%B3wnym%20%C5%BAr%C3%B3d%C5%82em,fragmentacji%20siedlisk%20i%20uszczelniania%20powierzchni [accessed: 2/03/2021].

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The impact of the pandemic on a consumer

The main mechanism of consumer activity is the subjective prioritisation of choices in relation to their needs21. Each person has their own individual set of values, which are suggested when making a choice. As Ewa Kieżel emphasises, consumer behaviour in the context of the choices he makes is a process that is characterised by certain dynamics[22]. It is characterised by an analysis of motives for making decisions and an assessment of their accuracy. The Modern Model of Consumer Behaviour Dynamics takes into account research from a wide range of sciences, such as psychology, economics, sociology and marketing. Researchers are observing the emergence of new phenomena in the consumer behaviour of developed countries, such as New Balance or Nomcore. These consist mainly in the selection of goods in relation to deeper values such as ethics, morality, normality, quality, comfort, durability, ordinariness or universality[23]. The economic crisis resulting from a pandemic is a period of revision of consumption needs for consumers. As a result of variables such as the risk of loss of income, a sense of security or the duration of the crisis, consumer choices are radically rationalised. The previously mentioned phenomena or newly emerging consumer trends are reconstructed.

The society of the new post-pandemic reality is forced to construct new rules of consumer behaviour. We are forced to adapt to the new situation, accept it and learn to live with that. After a crisis and a period of depression, we reach a lower turning point where the transformation begins[24]. A consumer, in the conditions in which he suddenly found themselves, became more cautious in the context of such values as the content of the wallet, convenience, safety, quality, trust. According to a report by KPMG, as many as 70% of Poles have refrained from major purchases as a result of the pandemic[25]. It is possible to see a return to concern for the satisfaction of basic needs connected with securing one's livelihood.

Before the pandemic had broken out, the factors that consumers paid most attention to were value for money, ease of purchase, trust in the brand, the range of products and services offered, and the personalisation of the product, service or attitude. During the pandemic, other values, including personal safety, ease of purchase, support for local communities, the brand's relationship with the environment and the brand's approach to employees increased[26].

21 J. Szczepański, *Wydajność pracy a konsumpcja*, „Nowe Drogi", no. 11.
22 E. Kieżel, *Zmiany zachowań a racjonalność w postępowaniu polskich konsumentów*, Wydawnictwo Uczelniane Akademii Ekonomicznej im. Karola Adamieckiego w Katowicach, Katowice 2001.
23 M. Rzemieniak, *Nowe tendencje w zachowaniach konsumentów – perspektywa marketingowa*, Wydział Nauk Ekonomicznych i Zarządzania, Politechnika Lubelska, Lublin 2016.
24 A. Śleszyńska-Świderska, *Zachowania polskich konsumentów w warunkach globalnego kryzysu gospodarczego*, rozprawa doktorska pod kierunkiem dr. ab.. Jerzego Borowskiego, prof.. UwB, Wydział Ekonomii i Zarządzania, Uniwersytet w Białymstoku, 2017.
25 KPMG, report entitled *Nowa rzeczywistość: konsument w dobie COVID-19. Jak zmieniły się zwyczaje zakupowe Polaków w czasie koronawirusa?*, https://home.kpmg/pl/pl/home/insights/2020/09/raport-nowa-rzeczywistosc-konsument-w-dobie-covid-19-jak-zmienily-sie-zwyczaje-zakupowe-polakow-w-czasie-koronawirusa.html [accessed: 2/03/2021].
26 KPMG, report entitled *Nowa rzeczywistość*…, op. cit.

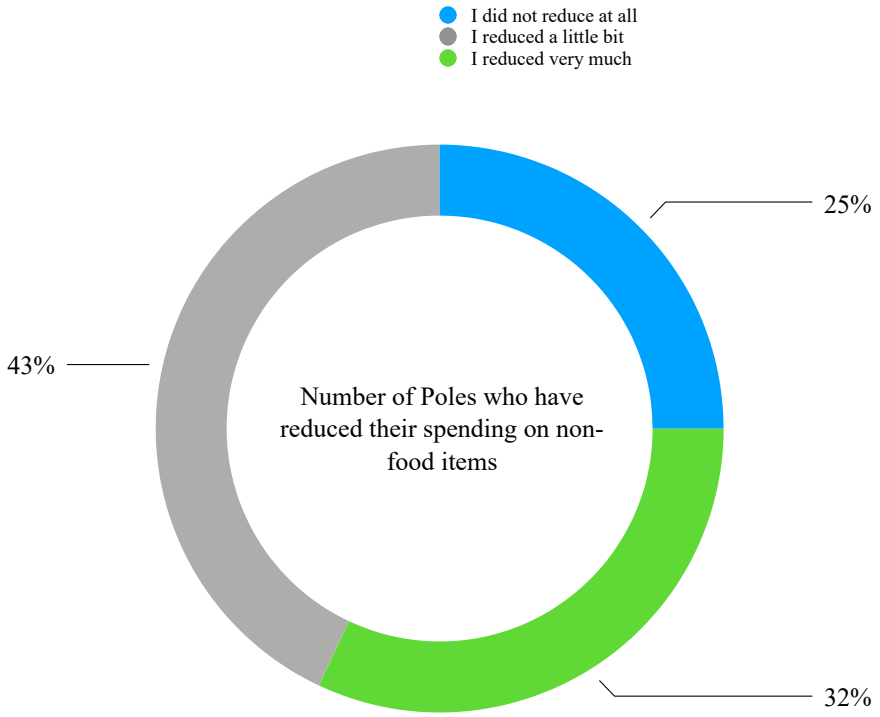

Figure 3. Number of Poles who have reduced their spending on non-food items, data source: ARC rynek i opinia

The difficult situation and the uncertainty associated with it have forced us to review our needs in terms of consumer behaviour. As a result of the pandemic, not only have the quantity and type of goods purchased changed but also the method of their purchase. The way of purchasing has also changed. The KPMG report shows that during the pandemic, 71% of the respondents abandoned traditional methods of purchasing non-food products in favour of purchasing these via online shops. 34% of Poles admitted that the pandemic encouraged them to buy products online that they had not bought before. Interestingly, 91% of the respondents confirmed their willingness to continue using this method of purchasing goods[27].

The situation is different when it comes to doing grocery shopping, as 66% of Poles have not abandoned traditional way doing shopping. Key factors for these people were the location of the shop (70%), the ability to see the product in person (63%), convenience (53%), and price (50%). As inconveniences of buying traditionally, respondents cited mainly inconvenience related to hygiene rules followed by other customers or personnel, difficult access or lack of means to protect against contamination, and the possibility of contamination through contact with product packaging.

An important aspect is the fact that 70% of Poles are able to spend more on food products that come from local suppliers. 60% of Poles pay attention to environmental issues, and 33% consider it

27 *Ibidem*.

important to support local communities when choosing everyday products. The pandemic will certainly have an impact on the purchasing decisions of the Polish consumer in the new, post-pandemic reality. However, one cannot be sure whether this will not be only temporary or whether there will not even be an increase in purchases once the SARS-Cov2 virus threat and the economic crisis have passed.

The hope may lie in systemic solutions that help to consolidate consumer change. The European Union, responding proactively to Europe's pandemic situation, has prepared a Consumer Agenda which sets out a vision for consumer policy for 2020-2025. This vision sets out issues in five areas of:

1. ensuring consumers have access to sustainable products and better information about them;

3. protecting against the dangers of digital trade;

4. improving the enforcement of consumer rights;

5. taking into account the specific needs of special groups of consumers, such as the elderly, children, persons with disabilities;

6. improving international cooperation.

Is the pandemic a rescue for the environment?

Greenhouse gases in the atmosphere are formed by natural processes as well as by human activities. Those resulting from human activity have been the most important indicator of observed climate change since the mid-20th century. Each of the gases, i.e. water vapour, carbon dioxide, CFCs, halons, methane, nitrous oxide, ozone and other gases, have the so-called *Global forming potential*. This is an index which tells us about the effect on the formation of the greenhouse effect. The contribution of different gases to the greenhouse effect depends on the degree of absorption, i.e. the ability of a given substance to absorb infrared radiation, and the lifetime of the gas in question. Of all the gases, water vapour has the greatest impact on the greenhouse effect, independent of man (as much as 95%). The best known greenhouse gas, second only to water vapour, is carbon dioxide CO_2.

Obviously, most of unmentioned coexisting gases also play an important role in greenhouse processes, but CO_2 as the main gas resulting from industrial activity and the burning of fossil fuels has become a universal indicator of environmental performance[28]. According to a report by the World Meteorological Organisation, in 2019, the average CO2 level reached another record - 410.5 ppm.

28 Muzeum Geologiczne Państwowego Instytutu Geologicznego, *Co to są gazy cieplarniane*, https://www.pgi.gov.pl/muzeum.html [accessed: 3/03/2021].

Similar concentrations of carbon dioxide occurred 3-5 million years ago. At that time, the temperature was 2-3°C higher and the sea level was 10-20 m higher than in our time[29].

The pandemic has affected many industries, which have been forced to slow down or even cease their operations altogether. The grounding of aircraft, the reduction in global production, the stopping of tankers in ports or the reduction in road transport have all had a significant impact on temporarily reducing CO2 emissions into the atmosphere.

According to a study carried out by Nature Climate Change, global atmospheric CO2 emissions at the peak of the lockdown on 7 April 2020 have decreased by 17%, the bulk of which (as much as 10%) relates to air transport. Only a small increase was observed in households[30]. The CREA report states that production in China has decreased by 15-40% depending on the industry, resulting in a reduction in CO2 emissions of 100 million tonnes, roughly the amount that Poland emits in three months[31]. According to the Ministry of Ecology and Environment in China, between January and March 2020, 337 cities saw air quality improve by as much as 84.5%[32].

However, the pandemic has shown us that we are dependent on products made from plastics. According to the National Library of Medicine - National Institutes of Health, an organisation focused on combating the effects of the pandemic, 469 tonnes of medical waste are generated per day in China, 8,055 tonnes per day in the US, 2,160 tonnes per day in India, 2,774 tonnes per day in Brazil[33]. Karina Szafranek-Braś, Vice-President of the Board of the Union of Employers of Plants for Thermal Transformation of Industrial and Medical Waste for Health and Environment Protection, estimates that the amount of medical waste in Poland is at least 50% higher than before the pandemic[34].

Medical waste obtained from medical units is a waste with specific sensitivity, as it is contaminated waste and therefore mainly subject to incineration[35]. It is worth noting that disposable masks and gloves used by the public to protect themselves against infection with the SARS-Cov2 virus do not fall under the European packaging recycling collection standards, as they are not disposable packaging

29 World Meteorological Organization, *Greenhouse gas concentrations in atmosphere reach yet another high*, https://public.wmo.int/en/media/press-release/greenhouse-gas-concentrations-atmosphere-reach-yet-another-high [accessed: 3/03/2021].

30 Nature Climate Change, *Temporary reduction in daily global CO_2 emissions during the COVID-19 forced confinement,* https://www.nature.com/articles/s41558-020-0797-x [accessed on: 3/03/2021].

31 CREA – Centre for Research on Energy and Clean Air, *China Nationally Determined Contribution (NDC) and Domestic 14th Power Five-Year-Plan (FYP)*, https://energyandcleanair.org/publications/draworld-china-climate-five-year-plan/ [accessed on: 3/03/2021].

32 *Koronawirus odkaża powietrze i mnoży śmieci*, „Business Insider", https://businessinsider.com.pl/wiadomosci/koronawirus-wplyw-na-srodowisko/dvgdfsh [accessed on: 3/03/2021].

33 M.S. Haque, S. Uddin, S.M. Sayem, K.M. Mohib, *Coronavirus disease 2019 (COVID-19) induced waste scenario*, PMID: 33194544, 7 November 2020, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7648514/ [accessed on: 3/03/2021].

34 *Czy pandemia to Eldorado dla spalarni odpadów medycznych?*, „Teraz Środowisko, https://www.teraz-srodowisko.pl/aktualnosci/odpady-medyczne-szpitale-spalarnie-pandemia-Szafranek-Bras-9711.html.

35 Esbud Zakład Przetwarzania Odpadów, *Odpady medyczne – jak wygląda ich utylizacja?*, https://esbud.pl/odpady-medyczne-i-ich-utylizacja/ [accessed on: 3/03/2021].

and are therefore not covered by the recycling scheme[36]. We can therefore expect the waste associated with the COVID-19 pandemic to be a huge environmental problem that will raise the statistics on the amount of pollution lying in the streets, rivers, seas and oceans.

The decrease in the amount of CO2 in the atmosphere, cited in sources as the optimistic effect of a pandemic, may in fact be offset by the impact that will be generated by the waste associated with the production and disposal of direct antiviral protection products, the increase in manufacturing activity for food and hygiene packaging, or the impact associated with the increased need to transport products ordered online.

According to scientists, there will be so-called retaliatory contaminations just after the pandemic has ended. These will be the result of the problems mentioned above and an intensification of all activities that were stopped under pandemic conditions[37].

Summary

According to EU environment spokesperson Vivian Loonela, it is too early to assess the environmental impact of the pandemic. The decrease in CO2 emissions into the atmosphere will probably have a positive effect on the environment, but unfortunately it will be short-lived. And it does not mean systemic change, according to Zbigniew Karaczun, Climate Coalition expert at the Warsaw University of Life Sciences[38]. A more significant impact will have a manner, in which people in power decide to stimulate the economy in the aftermath of a pandemic. A key aspect will be a strategy for the post-pandemic future, incorporating actions related to social responsibility and sustainable development in various areas.

Society, like a living tissue, reacts to changes in its environment, adapting to the freedoms and restrictions currently in place. The pandemic has reminded us that it is important to look at ourselves, take care of our health, well-being and fitness. According to the PWC report[39], almost all Poles consider caring about the environment to be important. A part of society has given up reflecting on its needs, its consumption choices and its possessions. Awareness of remote working and education has changed significantly. This is probably the area where most changes will occur in the post-pandemic future.

36 N. Apostolou, *Pandemia i plastikowy śmietnik 2020*, „Deutsche Welle", https://p.dw.com/p/3bQmL [accessed: 3/03/2021].
37 M. Wandas, *Emisje CO_2 w Chinach spadły o 100 milionów ton. Przez koronawirusa*, Smog Lab, https://smoglab.pl/ [accessed on: 3/03/2021].
38 Z. Karaczun, *Koronawirus ogranicza emisję CO_2. Kryzys po pandemii może jednak zepchnąć ochronę klimatu na drugi plan*, „Newseria Biznes", https://biznes.newseria.pl/news/koronawirus-ogranicza,p46255587 [accessed on: 3/03/2021].
39 I. Wisłocka, K. Bandowski, report entitled *Nowy obraz polskiego konsumenta. Postawy i zachowania Polaków w obliczu pandemii koronawirusa*, https://www.pwc.pl/pl/publikacje/nowy-obraz-polskiego-konsumenta.html [accessed on: 3/03/2021].

It is clear from the reports analysed that the problem does not lie solely in the attitudes of consumer society, but mainly in the awareness of business, industry and the management of a system which, unfortunately, still uses the mechanisms of the previous industrial era. In order for there to be a smooth transition, systemic principles need to be built that will help the global transition to a new, post-pandemic reality.

In the wake of the economic crisis caused by the pandemic, it can be expected that there will be a gigantic increase in all productive activity in the world. Therefore, when planning for a post-pandemic reality, it is imperative to prioritise environmental aspects in order to anticipate and plan each step wisely and sustainably. The hope is that, as a result of reflection on the pandemic and the crisis, all areas of industry, business and government will recognise the significance of the negative impact of people and their behaviour on the ecosystem and step up systemic action to accelerate change. There is an opportunity for this to be a turning point for an environment strained by over-consumerism. This is the time to define a new reality based on new values that will decisively help transform the future.

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