# The Age of Toxicity: A Theoretical Model

Ritambhara Malaviya

Department of Political Science, University of Allahabad, Prayagraj, India

*Abstract*— *Ulrich Beck theorized the contemporary world as the 'age of risk'. Taking the cue from Beck, this paper focuses on the ecological aspect of this risk society which looms large over the life and wellbeing of the entire planet – the intrusion of toxics in our everyday lives – thereby also making it the 'age of toxicity'. Toxics have permeated the entire ecosystem – from land to water to atmosphere – making it difficult for any life form to escape their impact. The paper attempts to explain the main features of this age of toxicity in an effort to find solutions to this problem. It might be noted that the problem of toxicity is not evenly distributed across the countries and the Global South bears the brunt of the problem. Further, toxicity has a disproportionate impact on the economically weaker and marginalized sections within the developing countries as they are forced by economic circumstances to live in areas which are environmentally degraded and polluted. The paper proposes that toxicity is engendered within a global system structured by three factors– international power conflicts, activities of corporate houses and the consumerist culture – which together create a vicious circle of toxicity. The paper therefore proposes that the concerned civil society groups could advocate policies aimed at weakening this vicious circle of toxicity and campaign for small steps in the direction of larger changes.*

*Keywords*— *development, environment, Global South, risk, toxicity*

## I. INTRODUCTION

**I**n the month of November in Delhi when the weather turns pleasant and children flock to parks, an environmental emergency sets in and schools shut down with news headlines announcing, "Toxic smog turns India's capital 'into a gas chamber'" (Zargar, 2022). This image of smog enveloping New Delhi, capital of the country poised to be the third largest economy in the world (India to be, 2023), is a grim yet representative image of the age of toxicity in which we are living.

A very unwanted yet integral consequence of industrial development, toxics, have permeated the entire ecosystem thereby threatening life on the planet itself. Scientists, environmental activists and scholars have continued to warn about the toxic past and present, and consequently, the future of the planet, however, little seems to have been done to resolve the problem. A prominent contribution is by the sociologist Ulrich Beck (1995) who theorizes the contemporary world as the age of risk. He

writes about a "global risk society" which is replacing national industrial society in which people feel that they are a part of a "threatened world" which faces major challenges from economic, environmental and terrorist risks. Taking the cue from Beck, it might be averred that in this age of risk, we are living amidst so much pollution, that within the field of ecology, this age can best be recorded as the 'Age of Toxicity'. We are living in a world where we are engendering toxicity at the cost of the life and health of billions of people in the world. From the air we breathe, to the water we drink and the food we eat, we have to face the intrusion of toxicity everywhere. A pioneering effort in raising awareness about the impact of toxicity was the award-winning book called *The Silent Spring*. In this book Rachael Carson (1962/2002), discusses the harmful effect of pesticides on the ecosystem, especially the effects of DDT. The problem of toxic chemicals has increased many folds since this initial warning was sounded, however, the pollution of the global environment with toxics has continued unabated. Therefore, this paper will try to analyse

the political and economic factors which lie at the root of the problem and how advocacy for better policies can pave the way to finding solutions to the problem of toxicity. The paper argues that three sources of the problem of toxicity can be identified: firstly, the international power conflicts; secondly, the corporate drive for profits; and thirdly, the culture of consumerism. These three factors, taken together, create a vicious circle of toxicity. The article concludes with some suggestions as to how policy advocacy can help weaken this vicious circle.

## II.    ULRICH BECK AND THE IDEA OF RISK SOCIETY

Beck posits that we are living in a risk society amidst "manufactured uncertainties" which are "unintended side effects of technological and economic development" that the modern world has pursued. These risks have three characteristic features: delocalization (i.e. the origin and impact of risks cannot be limited to a particular locale), uncalculability (i.e. it's not possible to calculate their possible consequences, so that we can only build probable scenarios) and non-compensability (i.e. it's not possible to compensate for damages like climate change) (Beck, 2008, p. 5).

These global risks are unequally distributed, as the more powerful can use their resources or intervene in decision-making to make themselves more secure from them and the problems are "exported" to the low-income countries or to the future generations (Beck, 2008, p. 8). Pointing towards a "fatal attraction between, poverty, social vulnerability, corruption, the accumulation of dangers, humiliation and the denial of dignity", he notes, "poorest of poor live in blind spots which are the most dangerous death zones of world risk society" (Beck, 2008, pp. 7-8).

This paper would explore how these political and economic hierarchies, which are interconnected and structure the modern world, influence the problem of toxicity across the countries. The paper attempts to diagnose the causes of the wilful negligence of the problem of toxicity across the world and also documents its disproportionate impact on the countries of the Global South. Further, on the basis of this analysis, the paper attempts to suggest some solutions which have been proposed to mitigate the problem.

## III.    THE THREE SOURCES OF THE PROBLEM OF TOXICITY

To understand the roots of the crisis, this section tries to understand the structure which engenders the problem of toxicity, i.e the relationship between politics, economics,

culture and toxicity. The problem of toxicity cannot be understood without understanding its political economy, i.e. how production and consumption is organized across the world. This, along with an analysis of the culture which sustains this process, gives an understanding of the structural dynamics of the problem. The paper posits that toxicity has become an intractable problem and policy fails to address the problem because of the interaction of three factors: political factors which include the politics of power at the international level, economic factors or the drive for corporate profits, and cultural factors comprising a global consumerist culture. Taken together these three factors set up a vicious circle of toxicity which impairs policy.

### 3.1  International Conflicts and Power Asymmetry

Wars have often been discussed with respect to factors like the emerging power dynamics, national interest and military technology. But an often-ignored aspect of wars is their environmental impact. The ongoing Russia-Ukraine war is a case in point. The UNEP Executive Director on the Ukraine War noted, "The mapping and initial screening of environmental hazards only serves to confirm that war is quite literally toxic" (https://www.unep.org/news-and-stories/story/toxic-legacy-ukraine-war). This section underscores the toxic aspect of great power politics and the contradiction that is created between the imperatives of maintaining an ecosystem which knows no borders and upholding the exclusive national interest which insists on maintaining the borders. The consequences, however, go out of hand like the proliferation of weapons of mass destruction (WMDs) and the risk of their unscrupulous use.

While wars occur for furthering the narrow agendas of some states, they endanger the life and well-being of millions of people all over the world. The use of toxics in war reached its first climax with the use of poison gas by Germany during the First World War (Hobsbawm, 1995, p. 28) and reached its rock bottom during the Second World War in 1945, when Hiroshima and Nagasaki witnessed a catastrophe in the form of lethal atomic bombs which generated horrific after-effects. After that, the use of 'dirty bombs' and chemical agents was a new chapter in the history of toxicity. The use of napalm in the Vietnam War resulting in charred human bodies has been recorded in history with horror. The Vietnam War also witnessed the use of a herbicide called Agent Orange, containing 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). The dioxin in the herbicide seeped into the soil and accumulated in the water bodies finding its way into the bodies of the residents causing serious health hazards (Schecter et al., 2001).

Further, the attempt to device deadlier and more lethal covert weapons led to the development of biological weapons. Biological weapons are designed to decimate

entire populations by giving them slow, painful deaths. They are designed to induce horrific disease outbreaks, wiping away centuries of struggle against diseases by eminent scientists and doctors who envisioned a healthier future for humankind. It might be noted that the 1972 Biological and Toxin Weapons Convention (BTWC) banned the production and stockpiling of these weapons. Yet the development of new technology has led to heightened risk of these weapons being developed and used across the world, "Advances in three specific emerging technologies—additive manufacturing (AM), artificial intelligence (AI) and robotics—could facilitate, each in their own way, the development or production of biological weapons and their delivery systems." (Brockmann et al, 2019, p. vii).

A study of some recent reports on recent wars and environmental disasters could help understand the gravity of the problem. A comprehensive report entitled "Witnessing the environmental impacts of war - environmental case studies from conflict zones around the world" edited by Susi Snyder (2020) documents the impact of wars and armed conflicts on environment with case studies on Iraq, Syria, Columbia, Yemen and Donbas. It documents effects like the pressure on water resources, land degradation, deforestation, and oil pollution due to conflicts. The socio-political turmoil even after the conflict is over continues to further degrade the environment.

Often, the discussions on wars ignore that the toxic wars and conflicts of the modern world are leaving a toxic legacy for the generations to come, and especially the human-induced changes to the ecosystem are not likely to wear away in the near future. The questions of who profits from war overshadows the question of what happen to the planet. Therefore, the next section tries to examine the link between corporate drive for profits and the age and toxicity.

### 3.2 Corporate Drive for Profits and Toxicity

While the competitive drive for profits can lead to wars, it has an impact on everyday lives during the so-called peace time as well. The industrial drive for profits has made life full of toxicity for the common people. Often, the world of business sets aside the environmental standards and food safety norms for increasing its profits. It has come to light through a number of studies and reports that markets can offer, without scruples, products that can prove disastrous for little babies and tender children as well as the adults. There are questions on the harmful effects of toxic products like the seemingly innocuous toys on children (an example is the instance of toxic coatings on toys in Africa as reported by the WHO Regional Office for Africa, 2015). Similarly, basic requirements like vegetables and fruits are often unsafe for consumption – an example of unscrupulous

practices is the artificial ripening of fruits in India through the use of calcium carbide despite the fact that it is banned (Press Information Bureau, 2023). Corporate houses have been known to have defaulted in maintaining prescribed standards for their products even in crucial fields like health and medicine. The Johnson & Johnson case of providing faulty hip implants in India from which toxic chemicals entered the blood stream is well known (Sheriff, 2018). Similarly, opioid overdose crisis in the United States and Canada has been linked to the corporate drive for profits and aggressive advertising and networking that kept the consumers in dark about its side effects (Marks, 2020).

However, as ecological consciousness has been on the rise, the developed countries have tried to maintain some standards for checking toxicity like banning pesticides, maintaining standards for consumer products and using environment friendly technology. Research points out how "large worker populations in the Third World are exposed to increasing amounts of pesticides, including pesticides severely restricted and banned in industrialized countries" (Wesseling et al., 1997). Similarly, an UNCTAD Report flagged the inequality in the use of environment friendly technology between developed and developing countries (UNCTAD, 2023). The Global South, therefore, is facing the brunt of the problem of products laced with pesticides and harmful chemicals. While the rich can afford expensive organic food or cleaner water, the economically less well-off become consumers in a market full of cheap toxic products. Toxicity has a disproportionate impact on the economically weaker and marginalized sections in the Global South. The problem is multi-pronged:

1. In the Global South, because of lax regulations, the industries produce at the cost of polluting the environment, and in conditions which are hazardous for the workers as well as the residents of surrounding areas. One can discuss the activities of mining companies which have been associated with unscrupulous extraction of resources and contamination of surroundings, an example being Jharkhand's Roro Hills (in India) where toxics from asbestos and chromite waste have been seeping into the soil and causing pollution due to negligence of mining companies (Dutta et al., 2003) Further, oil exploration in Africa is an important case in point and the unethical practices of Multinational Corporations in polluting the environment for the poor and vulnerable surrounding areas is well known (Adeola et al., 2022).

2. Within the countries of the Global South as well, the problem of toxicity is unequally distributed. The poor have to bear the problem disproportionately, as they are forced by economic circumstances to live in areas which are environmentally degraded and polluted. They are also

forced to work in occupations which are hazardous for their health.

3. The developed countries outsource their hazardous activities to the low-income countries and also tend to use them as their dumping yard for toxic wastes. Numerous such examples can be found, for instance, a report by Greenpeace (2022) which highlights the dumping of plastic wastes in Turkey (now Türkiye), or the report by the Office of the High Commissioner for Human Rights which documents how inhabitants of Haiti's Cité Soleil are facing extreme "environmental injustice" because of the dumping of toxic waste in their area (OHCHR, 2022). The problem of disposing off e-waste has been shown to be having a tragic impact on the lives of the women of childbearing age and children living near the e-waste dumping sites, "The problem is most severe in low- and middle-income countries, where significant numbers of impoverished city dwellers work or live near the burgeoning informal dumps and landfills that are the graveyards for much of the world's e-waste" (WHO, 2021, p. xii). It has been pointed out that the activities of the multinational corporations have resulted in unparalleled levels of pollution in the countries of the Global South giving them a toxic present and possibly a dark future. A good example is Nigeria where the activities of oil firms led to numerous oil spills which wreaked havoc in the lives of people (Hodal, 2017; Craig, 2022). This is often called environmental racism, which is, "the deliberate targeting of people of color communities for toxic waste facilities and the official sanctioning of life-threatening presence of poisons and pollutants in people of color communities" (cited in Krieg, 1998, p. 3).

Unregulated exploitation of resources and unscrupulous dumping of wastes in the Global South are important consequences of the asymmetric economic development in the world which is a legacy of colonialism and imperialistic wars. However, it is worrisome that in emulating the developed countries, the developing countries are trying to achieve a rapid economic growth at the cost of their environment. Unregulated exploitation of resources as seen in the depletion and contamination of underground water and cutting down of forests for the hunger of timber are two most common examples of how water and air become too polluted for sustaining healthy life. In course of time the industrial areas of the developing countries become nothing less than environmental disasters as treating waste and using green technology are expensive ventures and increase the cost of production. For example, a report in *Hindustan Times* detailed the plight of the people of Singrauli in Uttar Pradesh (India) whose lives were affected by severe pollution levels caused by coal plants in the district. Singrauli has been in the list of the industrial clusters declared critically polluted by the environment ministry in 2009 (Vyawahare, 2018). The report pointed towards problems like pollution due to coal dust and high levels of mercury in blood samples of people. Others in the list of Critically Polluted Areas (CPA) were Vapi, Vatva and Ankaleshwar in Gujrat, Ghaziabad and Noida, in UP, Vellore in Tamil Nadu and Panipat in Haryana. Landfill sites in Delhi routinely catch fire because of methane gas that is produced by the decomposing garbage. However, people are forced by economic circumstances to live near them (Iqbal, 2019). Even the rivers in India remain badly polluted due to industrial effluents (Sengupta, 2018).

It might also be pointed out that the well-off might avoid such problems but cannot escape pollution in other forms. The Global Burden of Disease study 2017 (Balakrishnan et al., 2018) pointed out the harmful level of particulate matter across India and its harmful effects on the health of people. The age of toxicity is thus trapped in two contradictions – firstly, profits in the short run blind people to the long term impact on their health and secondly, the ability of the well off to live in sanitized spaces blinds them to the fact that all form part of an ecosystem from whose impact none can escape.

A substantial amount of literature is directed towards studying the impact of population growth on environmental degradation and pollution. However, it is not only the growth of population but also its distribution which emerges as the culprit. Lack of gainful employment in rural areas results in massive migration to the metropolitan centres where urban poor live in congested slums and squatters, in settings contaminated by waste and sewage. Heavy traffic, with commuters travelling kilometres to workplaces, leads to high levels of pollution. Urban waste becomes a massive problem with no attention given to its disposal. A balanced development of rural areas could prevent the cities from over-crowding. However, the policy of developing countries is seldom focused on the rural areas and these are treated as peripheral areas of concern for policy makers.

Despite the rise in the levels of environmental awareness, environmental policy formulation and implementation remain weak. This political apathy cannot be understood without understanding the culture of apathy that has developed around a consumerist culture. Consumerism has spread across the world with the speeding up of globalization under the influence of this culture of consumption, people compulsively ignore the environmental risks. This public apathy and ignorance provides the cultural backup to support unsustainable structure of production and consumption. The next section discusses this in detail.

### 3.3 Consumer Culture and Toxicity

The toxic economics and politics have culminated in a culture which sustains the vicious circle of toxicity. The Cocoyoc Declaration (adopted in the UNEP/UNCTAD Symposium on Patterns of Resource Use, Environment and Development Strategies Held at Cocoyoc, Mexico, from 8 to 12 October 1974) had presciently declared, "It does not help us much to produce and consume more and more if the result is an ever-increasing need for tranquilizers and mental hospitals" (The Cocoyoc Declaration, 1975). Toxicity is no longer an external factor and has deeply pervaded human body and mind. That is why it is pertinent to call this – the age of toxicity.

A consumerist culture helps sustain the corporate drive for profits. Development after industrialization was about the drive for better standards of living which translated into consuming more for a fashionable lifestyle – better housing, more consumer products like air conditioners and refrigerators, more use and throw products made of plastic, more gadgets that had to be upgraded each year. In a consumer society, a person's worth is measured according to the brands they use or the expensive lifestyle that they maintain. The charm of a glamorous life lures people down below in the economic hierarchy to emulate the lifestyle of those above them in a spiral of continuously increasing demand for more consumer products and the desire to obtain them at any cost as a means to enhancing their social status.

However, this has grave implications for ecological sustainability. The enormous amount of toxics released into the environment to sustain the fashionable lifestyles keep on polluting without the consumers realizing that this is leading them into a trap where their quality of life gets diminished due to pollution and its impact on health. The merciless consumerist culture, with grand shopping malls charming the customers to 'shop till you drop', seems to be driving the society to a point of ecological collapse. Customers shop for products undeterred or ignorant of the harmful impact of such products. There have been concerns about the use of plastic products, "plastic makes up 80% of all marine debris found from surface waters to deep-sea sediments" (IUCN, 2021), or discussions on the e-waste production, "In 2019, an estimated 53.6 million tonnes of e-waste were produced globally, but only 17.4% was documented as formally collected and recycled" (WHO, 2023) or the knowledge that dyes from textile industry released into water bodies impact the plant life as well as enter the food chain and are carcinogenic (Lellis et al., 2019). Here also, the most vulnerable are the people of the Global South, especially the women and children, "ILO and WHO estimate that millions of women and child labourers working in the informal recycling sector around the world may be at risk of e-waste exposure" (WHO, 2023). The dumping of toxic wastes including plastics, chemicals and radioactive waste in oceans has become a major source of concern (Häder, 2021). However, these concerns disappear in the minds of the consumers as they shop in malls or on e-shopping apps with lucrative advertisements that invite everyone to be a part of the consumer carnival.

The culture of consumerism, the economy of corporate profits and the international power politics reinforce each other in a vicious circle in which either the policies are directed towards sustaining corporate profits or the implementation of environment friendly policies gets impaired. The paper therefore notes that the way to break the vicious circle is through the efforts of civil society to campaign for eco-friendly policies which build an alternative culture brick-by-brick which breaks the spell of the consumer culture.

## IV.   CONCLUSIONS – ECOLOGICAL ALTERNATIVES

Alternative models of economy talk about a different pattern of living, producing and consuming, for instance in the form of concepts of decentralized ecological communities based on Gandhian models or proposals for a SHE future (Sane, Humane and Ecological economy) in contrast to a HE (Hyper-Expansionist) economy (Robertson, 1983). Scholars have pointed out that the unscrupulous capitalist drive for profits is unsustainable (Kovel, 2007) and needs to be replaced by ecological patterns of living. Further, the idea of degrowth has been posited as an alternative to the idea of increasing production at the cost of sustainability. The idea focusses on production for human wellbeing instead of production for the sake of increasing GDP, though there are debates about the economic viability of these models (see Hickel, 2021). Though, there is still very little agreement on some concrete and viable models which show a way out of the present crisis, however, the basic agreement between these models is the common minimum focus on finding alternatives to an economy based on the principle of profiteering at the cost of sustainability. The first step in the direction could be pushing for more democracy where some vested interests are not privileged over and above the common societal interests. Amidst these debates one could start with the 'doable'. Environmental campaigns for banning harmful products and pushing for policies for corporates to follow environmental standards could be the first step for changing the consumerist discourse and culture.

A second set of policy advocacy could be directed towards addressing the lopsided, inequitable and

unjust development in the world. Models of development which try to bridge the chasm between the rural and the urban, the metropole and the satellite, the developed and the underdeveloped can lead to a better living space for all across the world. Countries could begin with alterations in their domestic policies. Building ecological spaces like urban plantations and eco parks and rural development for cleaner villages to check environmental degradation is a very important step in the direction. Creation of employment in rural areas, with provision of better educational and health facilities and proper connectivity, can prevent mass migration to cities and could also help decongest urban spaces. Ecological cities with eco-friendly lifestyle – like phasing-off disposable plastic items, planning eco-friendly housing which needs less air conditioning, roads with bicycle tracks and better public transport facilities to phase-off private vehicles, and designing green residential office campuses to encourage cycling could all help in their own way. Better management of urban waste is also very important and strategies for reducing dependence on plastic products and recycling of waste must be given policy priority.

The development of alternatives is a process of self-searching and self-correction by the society. Much more work is required in this direction. Policy advocacy is one of the ways of popularising alternative lifestyles and offering an alternative concept of production and consumption. This paper tries to discuss the problem of toxicity and attempts to outline its structure. Understanding toxicity as a structural problem enables one to search for alternatives which can weaken the hold of these structures. It is through a ceaseless search for alternatives that the world could move towards saner and better economics and politics which breaks the vicious circle of toxicity.

## REFERENCES

[1] Adeola, A.O. , Akingboye A.S., Ore O.T., Oluwajana O.A., Adewole A.H., Olawade D.B., Ogunyele A.C. (2022). Crude oil exploration in Africa: socio-economic implications, environmental impacts, and mitigation strategies. *Environment Systems & Decisions,* 42(1), 26-50. https://doi.org/10.1007/s10669-021-09827-x.

[2] Balakrishnan, K., Dey, S., Gupta, T., Dhaliwal, R., Brauer, M., Cohen, A., Stanaway, J., Beig, G., Joshi, T., Aggarwal, A., Sabde, Y., Sadhu, H., Frostad, J., Causey, K., Godwin, W., Shukla, D. & Kumar, G A., Varghese, C., Muraleedharan, P., Dandona, L. (2018). The impact of air pollution on deaths, disease burden, and life expectancy across the states of India: The global burden of disease study 2017. *The Lancet Planetary Health*. https://doi.org/ 3.10.1016/S2542-5196(18)30261-4.

[3] Beck, U. (1995). *Ecological politics in an age of risk*. Cambridge: Polity Press.

[4] Beck, U. (2008). World at risk: The new task of critical theory. *Development and Society,* 37 (1), 1-21.

[5] Brockmann, K., Bauer, S. & Boulanin,V. (2019). *Bio plus x: Arms control and the convergence of biology and emerging technologies*. Solna: SIPRI.

[6] Carson, R. (2002). *Silent spring*. Boston: Houghton Mifflin (Original work published 1962).

[7] Craig, J. (2022). The village that stood up to big oil - and won. *The                                          Guardian*. https://www.theguardian.com/environment/ng-interactive/2022/jun/01/oil-pollution-spill-nigeria-shell-lawsuit

[8] Dutta, M., Sreedhar, R. & Basu, A. (2003) The blighted hills of Roro, Jharkhand, India: A tale of corporate greed and abandonment. *International Journal of Occupational and Environmental Health*, 9(3), 254-259. https://doi.org/ 10.1179/oeh.2003.9.3.254

[9] Greenpeace. (2022). *Game of waste: Irreversible impact*. https://www.greenpeace.org/static/planet4-turkey-stateless/2022/02/be5d1ad3-game-of-waste-global-plastic-waste-trade-impact-on-turkey-greenpeace-report.pdf

[10] Hickel, J. (2021). What does degrowth mean? A few points of clarification. *Globalizations*, 18:7, 1105-1111. https://doi.org/ 10.1080/14747731.2020.1812222

[11] Häder, D. (2021). Dumping of toxic waste into the oceans. In D. Häder, E.W.Helbling, & V.E. Villafañe (Eds.) *Anthropogenic pollution of aquatic ecosystems* (pp. 353-371). Cham: Springer. https://doi.org/10.1007/978-3-030-75602-4_16

[12] Hobsbawm, E. (1995). *Age of extremes: The short twentieth century*, *1914-1991*. London: Abacus.

[13] Hodal, K. (2017, November 6). 'Absolutely shocking': Niger Delta oil spills linked with infant deaths. *The Guardian*. https://www.theguardian.com/global-development/2017/nov/06/niger-delta-oil-spills-linked-infant-deaths.

[14] Iqbal, N. (2019, December 15). Fires and smoke cloud Ghazipur landfill site, but it's business as usual for residents. *The                  Indian                  Express*. https://indianexpress.com/article/cities/delhi/fires-and-smoke-cloud-ghazipur-landfill-site-but-its-business-as-usual-for-residents/

[15] IUCN. (2021). Marine plastic pollution. IUCN Issue Briefs. http://www.iucn.org/issues-briefs

[16] Kovel, J. (2007). *The enemy of nature: The end of capitalism or the end of the world*. London and New York: Zed Books.

[17] Krieg, E.J. (1998). The two faces of toxic waste: Trends in the spread of environmental hazards. *Sociological Forum,* 13(1): 3-20.

[18] Lellis, B., Fávaro-Polonio, C.Z., Pamphile, J.A., Polonio, J.C. (2019). Effects of textile dyes on health and the environment and bioremediation potential of living organisms. *Biotechnology Research and Innovation*, 3(2), 275-290. https://doi.org/10.1016/j.biori.2019.09.001.

[19] Marks, J.H. (2020). Lessons from corporate influence in the opioid epidemic: Toward a norm of separation. *Journal of*

*Bioethical Inquiry*, 17(2): 173-189. https://doi.org/ 10.1007/s11673-020-09982-x.

[20] OHCHR. (2022). Haiti: UN experts alarmed by extreme environmental injustice in cite Soleil. https://www.ohchr.org/en/press-releases/2022/07/haiti-un-experts-alarmed-extreme-environmental-injustice-cite-soleil

[21] Press Information Bureau. (2023, 11 March). Ripening of fruits. https://pib.gov.in/PressReleasePage.aspx?PRID=1905866#:~:text=Acetylene%20gas%20released%20from%20calcium, fruits%20is%20banned%20in%20India.

[22] Robertson, J. (1983). *The sane alternative: A choice of futures.* St. Paul: River Basin Publishing Co.

[23] Sample, I. & Fleming, N. (2003, April 17). When the dust settles. *The Guardian*. https://www.theguardian.com/education/2003/apr/17/science.highereducation1

[24] Schecter, A., Le Cao Dai, Päpke, O., Prange, J., Constable, J. D., Matsuda, M., Duc Thao, V., Piskac, A. L. (2001). Recent Dioxin contamination from Agent Orange in residents of a Southern Vietnam city. *Journal of Occupational and Environmental Medicine,* 43(5), 435-443. http://www.jstor.org/stable/44995800

[25] Sengupta, S. (2018, March 14). Cleaning India's polluted rivers. https://www.downtoearth.org.in/news/water/cleaning-india-s-polluted-rivers-59877.

[26] Sheriff, M. K. (2018, August 30). How Johnson and Johnson hip implants system went wrong. *The Indian Express*. https://indianexpress.com/article/explained/johnson-and-johnson-how-hip-implants-went-wrong-jp-nada-5331779/

[27] India to be (2023, December 05). India to be world's third largest economy by 2030, S&P. *The Hindu*. https://www.thehindu.com/business/Economy/india-to-be-worlds-third-largest-economy-by-2030-sp/article67607577.ece

[28] Snyder, S. (Ed.) (2020). Witnessing the environmental impacts of war - Environmental case studies from conflict zones around the world. https://zoinet.org/wp-content/uploads/2018/01/Witnessing-the-environmental-impacts-of-war_EN.pdf

[29] The Cocoyoc Declaration. (1975). *International Organization*, 29(3), 893-901. http://www.jstor.org/stable/2706353

[30] UNCTAD. (2023). Technology and innovation report 2023: Opening green windows technological opportunities for a low-carbon world. March 2023. https://doi.org/10.18356/9789210023443

[31] Vyawahare, M. (2018). State apathy continues to choke Singrauli. *Hindustan Times*, New Delhi.

[32] Wesseling, C., McConnell, R., Partanen, T., Hogstedt, C. (1997). Agricultural pesticide use in developing countries: Health effects and research needs. *International Journal of Health Services*, 27(2), 273-308. https://doi.org/ 10.2190/E259-N3AH-TA1Y-H591.

[33] WHO Regional Office for Africa. (2015). *Lead exposure in African children: Contemporary sources and concerns*. Regional Office for Africa. https://apps.who.int/iris/bitstream/handle/10665/200168/9780869707876.pdf;jsessionid=F6BE0E4266BAF5CE1D6013A13B660AB0?sequence=1

[34] WHO. (2021). Children and digital dumpsites: e-waste exposure and child health. https://www.who.int/publications/i/item/9789240024557

[35] WHO. (2023, October 18). Electronic waste (e-waste). https://www.who.int/news-room/fact-sheets/detail/electronic-waste-(e-waste).

[36] Zargar, A.R. (2022). Toxic smog turns India's capital 'into a gas chamber'. CBS News. https://www.cbsnews.com/news/india-delhi-smog-haze-air-pollution-2022-severe-farm-fires/