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Deepening environmental crisis: when prevention and environmental responsibility measures do not work

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Abstract

The article reports the results of qualitative research, with a Phenomenological design and Interpretative paradigm regarding the worsening of the environmental crisis when prevention and environmental responsibility measures do not work in the district of Sayán, department of Lima, Peru. The study convened eight participants who were interviewed in depth in an inductive and in-depth process. The categories were: 1. environmental pollution; 2. preventive approach; 3. environmental responsibility; and 4. environmentally friendly technologies. The data obtained went through a process of codification, analysis, interpretation and discussion of results with the help of Atlas.ti. It is concluded that Sayán, despite being located in a mostly rural area with little presence of modern urban activities, is polluted, with the presence of solid and chemical waste in the streets, excessive use of fertilizers in the fields, among other highly polluting components; there is an evident worsening if relevant measures are not taken. Municipal ordinances that prohibit irresponsible environmental human actions are ineffective in stopping air, soil and water contamination rates. Educational institutions are not effectively complying with the preventive approach and do not have environmental accounting implemented, nor is the use of information and communication technologies to support dealing with the ever-increasing environmental pollution. People generally show attitudes and behaviors that go against the care of the environment.

Keywords: *environmental crisis, environmental prevention, environmental responsibility.*

Introduction

The ecological deterioration faced by the planet today is a consequence of the civilizational crisis of the West that is accentuated according to the advances of the anthropocentric ideals of capitalism and modernity as hegemonic economic models that contradict the moral condition of

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nature and turn it into an object of exploitation and satisfaction of people's interests (Clavijo et al., 2022). According to Toledo (2018), one of the main factors of the crisis is where the capitalist market, industrialism, scientific thought, oil use, and industrialization converge. The negative effects on the environment are a consequence of human activities when producing goods and services, which leads to the alteration of ecological balances, often irreversibly (Pérez et al., 2016).

The global environmental problem continues despite government efforts and international agreements to preserve the environment. Despite the emergence of a policy of ecology, the problem continues, so it is necessary to enter into sustainable development with active participation of ecological citizens whose central activity should be in the responsibility and exercise of citizenship for the environment and giving a more active role to societies in the process of transformation (Rutti-Marín et al., 2022). The problem is more acute in developing countries due to rapid population, and urban and industrial growth (Behera et al., 2017).

In the face of ecological deterioration, it is essential to address appropriate management plans for pollutants generated by human activities, especially business activities in terms of production and consumption (Dos Reis et al., 2020). It is also necessary to reflect and act with holistic criteria to counteract it through sustainable development (Mejía et al., 2021), so it is necessary the ecological ethics that has aspirations to transcend the anthropocentric look characteristic of the modern era to give way to a divergent environmental rational attitude through the cultural, ethics, politics and epistemology (Alvarado, 2019). It is about promoting and building a rational environmental mentality with the ability to exercise counter-hegemonic actions for a sustainable world (Leff, 2011); for which it is essential to assume obligations and responsibilities towards nature, with intergenerational ethics in the different behavioral actions for the good of nature and with a vision that has a positive impact on future generations; that is, to act with ecological ethics (Alvarado, 2019). In addition to this, it is necessary to address critical, inclusive, supportive and transformative environmental education in direct relation to the needs and interests of nature and society; through education, it will be possible to make substantial changes in the conception of the world and contribute to sustainable development to ensure a healthy environment for equitable and sustainable growth. The sustained implementation of environmental education as urgency is presented as one of the challenges in the world to form critical citizens with projections towards the construction of a sustainable world (Cóndor-Salvatierra et al., 2022), understood as that capacity to achieve the progress of humanity following the protection of natural resources, animal and plant life, ecosystems and, at the same time, reduce exclusion and improve the living conditions of society (Mejía et al., 2021).

Another aspect of vital importance is corporate social responsibility (CSR) as a vital tool for

reducing critical environmental levels. From an ontological perspective, CSR began to be standardized in the world after the Global Compact organized by the United Nations on January 31, 1999, in Switzerland, where ten principles were established under four central themes: human rights (principles 1 and 2); labor (principles 3, 4, 5 and 6); anti-corruption (principle 10) and the environment (principles 7, 8 and 9). These last principles suggest that companies consider a prevention approach that enables environmental care, encourages initiatives to promote environmental responsibilities, and contributes to developing and diffusing environmentally friendly technologies (Tamayo and Ruiz, 2018). Following these universal care principles for the planet, companies should actively and voluntarily contribute to environmental, labor and social improvement with appropriate behaviors and sustainably (Gallegos and Martinez, 2006). These three principles seek to reduce the environmental impact of production activities by companies: reduction of resource consumption to minimize emissions; reduction of energy costs; implementation of adequate environmental management systems; and responsible use of raw materials.

Because of the vertiginous environmental pollution in the district of Sayán, Municipal Ordinance No. 010-2016 was enacted in the Official Gazette El Peruano (October 17, 2016), by which the dumping of waste, organic and inorganic waste, weeds and waste in general in the streets of the town of Sayán is prohibited; likewise, they establish the conditions for the reception and disposal of land clearing. The document bearing the mayor's signature at that time is addressed to the community of Sayán to enforce the ordinance in accordance with the Organic Law of Municipalities No. 27972 and in the framework of Article 194º of the Political Constitution of Peru. However, according to the investigation results, the document becomes an ordinance that is not complied with regarding the prevention of environmental contamination in the said locality. Furthermore, a piece of information broadcast by a nationwide radio station (RPP, January 9, 2018) gave an account of the intoxication of 11 people after consuming fumigated grapes in Sayán. This fact clarifies the actions of some people who use polluting substances that affect the population's health.

Prevention is a measure that people must take to curb the growing environmental pollution in the world. On June 5, 2023, World Environment Day will be celebrated, and the theme is plastic pollution (UNEP, 2023). Although this global action is an afterthought to global plastic pollution, it is also a preventive measure against the continuation of the increasing global pollution. In the world, more than 400 million tons of plastic are produced annually; half of this product has a single-use useful life; less than 10% is recycled and between 19 and 23 million tons are disposed of in rivers, lakes and seas. According to estimates, people ingest over 50 thousand plastic particles yearly. With the slogan:"no plastic pollution" the world organization expects to convene representatives from more than 150 countries to consolidate preventive strategies in the face of global environmental pollution, an issue that concerns all the planet's inhabitants.

Being environmentally responsible means that all people must act with unrestricted respect for nature, which leads to the development of a significant environmental awareness that will preserve the environment. Education is a factor associated with the development of responsibility for the environment, ranging from the early years of schooling to the university academic environment, in a sustained manner. Research by Alfirević et al. (2023) reports a significant favorable influence on the environmental responsibility of 530 university students from the development of individual attitudes and responsibility through exposure to relevant educational content. According to this study, it is likely that students exposed to pro-social attitude development programs can contribute to the development of environmental responsibility to address the increasing environmental pollution by human activities worldwide.

Nowadays, using information and communication technologies to prevent environmental pollution is more than a fact: it is a necessity. The study by Munive et al. (2018) evidences that if technologies are used to analyze and solve environmental problems, they are solved as long as their use is done adequately and continuously. The research considered the use of ICT's in learning sessions in educational institutions to train students to identify factors associated with the environmental pollution in the area and, consequently, to address solution strategies to reduce environmental pollution, either by eliminating some polluting factors or by other cases, to take a more active role to assume a leading role in non-pollution.

Theory of "creative destruction"

To explain the present and future of societies with environmental crises, it is necessary to understand the nature of the theory of "creative destruction" developed by Schumpeter (1942) that, in general terms, the development of economies takes place in two dimensions: innovation and entrepreneurs. During economic phases, in periods of crisis, obsolete organizations and companies disappear so innovative companies can emerge to grow the economy. However, economies in the development process are not in equilibrium but are affected by technological innovations, which create imbalances that are precisely those that allow the economy to develop. Meanwhile, entrepreneurs are the driving force that generates innovations because they bring them to the market and benefit society in general. These dimensions are related to the environment in the sense that, with the growing environmental deterioration, innovation must consciously focus on the use of clean energies to benefit the environment; however, what happens when technologies are not used properly and, on the contrary, produce waste that pollutes the environment; in this case, this refers to the fact that "creative destruction" can improve economies at the cost of the destruction of nature.

II. METHOD

The research was conducted with the orientation of the Interpretative-Naturalistic paradigm through the qualitative approach, Phenomenological design, descriptive level and basic type of study. The Interpretative paradigm does not seek to make generalizations but to make

interpretations of the dynamic and interactive reality from a holistic perspective by the researcher, who is the main instrument of observation (Ricoy, 2006). From the viewpoint of symbolic interactionism that contextualizes qualitative research, the following itinerary was followed: b) Objectification of the perceptions and assessments of the participants-informants; c) Deepening the understanding of the meanings of the researcher-participant interactions; d) Understanding of the subjectivities emerging from the inquiry regarding educational, social responsibility in the face of the environmental crisis in the town of Sayán, province of Huaura, department of Lima, Peru. The participants were eight people who have full knowledge of the environmental pollution in the district of Sayán and proposals for coping with it.

Table 1

Research informants

NO.	Participants
1	Official of the District Municipality of Sayán
1	Official of the Unidad de Gestión Educativa Local Nº 09 of Huaura
1	Specialist in environmental pollution issues and coping strategies.
1	Director of a public institution in Sayán
1	Science and Technology teacher at a public educational institution in Sayán.
1	Parent of a public institution in Sáyan
1	Student leader of an educational institution in Sayán
1	Neighborhood leader who has lived in Sayán for many years

The in-depth interview technique was applied using a semi-structured interview guide to obtain information in the inductive fieldwork. In the beginning, six informants were considered, but when there was a lack of information, the number of informants was increased to eight until the information saturation point was reached. The procedure followed the analysis and structuring of the information acquired through the interview and followed the data transcription in a matrix; the reduction and coding of the data; categorization, content analysis and interpretation. Atlas.ti software was used for the analysis of the qualitative data. The categories and subcategories are shown below:

Table 1

Categorization matrix

Categories	Subcategories
Environmental contamination in Sayán	Water pollution
	Air pollution
	Soil contamination

Preventive approach	Dissemination campaigns Environmental talks Environmental education
Environmental responsibility	Energy resource management Fertilizer use Solid waste management Environmental protection areas Community involvement
Environmentally friendly technologies	Environmental accounting Automation system CO2 reduction Green technology

III. RESULTS AND DISCUSSION

Category 1: environmental contamination in the Sayán community

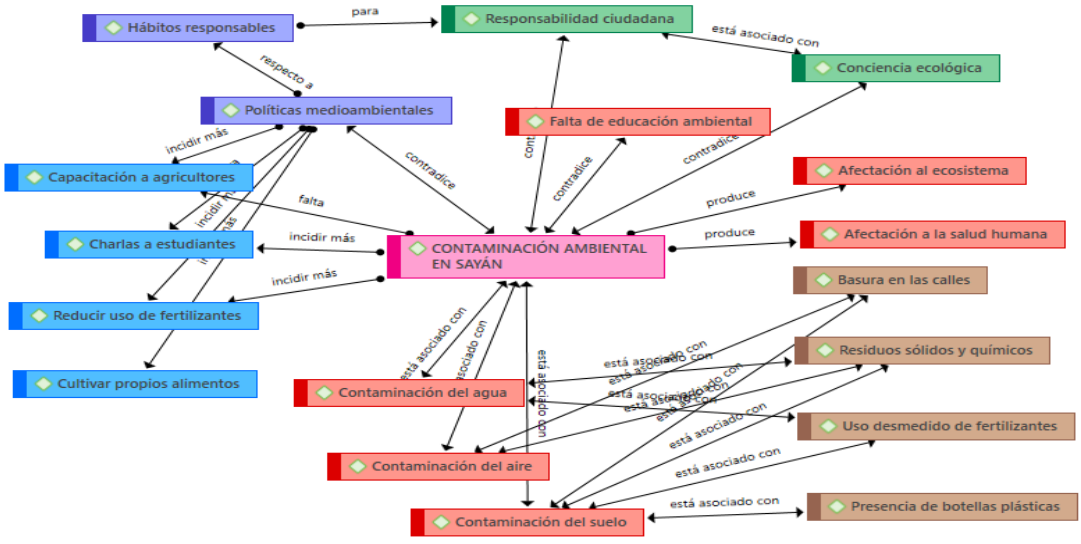

Figure 1. Environmental contamination in the town of Sayán

According to the results obtained from informants, the town of Sayán, despite being mostly rural and surrounded by nature, is currently polluted. Although it is not at a high level of environmental contamination compared to the country's large cities, contamination is increasing more frequently, and if action is not taken immediately, Sayán will be a highly contaminated area with eminent risks to the health of the population, ecosystems, and flora and fauna in general. According to those

interviewed, Sayán's water, air, soil, and ecosystems are contaminated. In addition, there is solid and chemical waste in the streets and excessive use of fertilizers in the fields. Faced with this problematic situation, the informants ask the authorities to implement and execute environmental policies from the various sectors of civil society, especially the educational enterprise. "Actions would be talks to reflect on the bad being done as a citizen and become aware" (E6). They call on all inhabitants to become environmentally aware because "All people are responsible for pollution" (E2). "Those responsible are the citizens themselves, providing information on environmental care" (E4).

Based on these results, i.e., in the face of the crisis of nature, which is the sum of constant ecological deterioration, there is an urgent need to deconstruct modern Western rationality, for which it is necessary to propose possibilities for dialogue of knowledge through inclusive education that tends to value and encourage responsible and dignified treatment of nature (Clavijo et al., 2022). The human blunders that have led to the generalized crisis at the planetary level are due to the expansion and expansionism of economic growth on a global scale based on utilitarian, anthropocentric ideals and the accumulation of capital. This crisis is the result of manifestations of socio-historical processes in the structural crisis at the international level, so it is necessary and urgent to articulate strategies to enhance sustainable development and sustainability to preserve the planet. Hernando Cuñado & Enríquez Román (2021) found a relationship between the loss of biodiversity in Colombia and the transmission of various diseases in people living in critical environmental contexts transmitted through animals.

Category 2: a preventive approach to environmental pollution

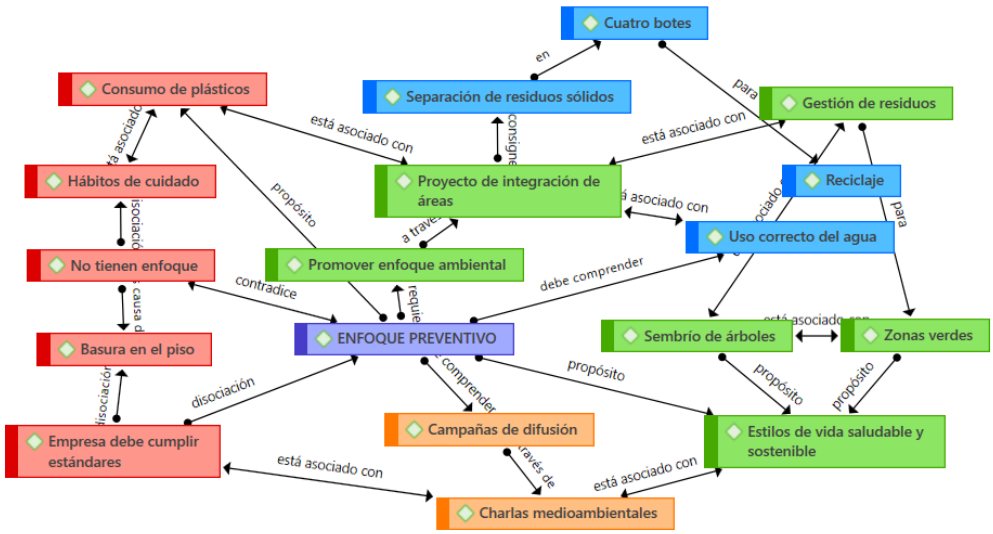

Figure 2. Prevention approach to environmental pollution in Sayán.

According to the results of the informants, the educational company that trains students in the Sayán locality is not effectively fulfilling the environmental pollution prevention approach, especially in terms of immediate actions such as the development of environmental care habits, the reduction of plastic consumption in daily life. "It does not have the approach because in the first place, the garbage waste should be separated into four parts" (E3); facing this interviewee, 4 specifies: "... I would encourage students not to leave garbage on the floor and remind them that they should always throw it in the garbage can." As an educational institution, it should not only train its students in attitudes and behaviors that care for the environment, but also extend them to families and the community in general, fulfilling its function of educating society: care for the environment. Faced with this reality, the interviewees suggest acting to counteract the growing pollution in the locality:"... to separate by four garbage cans: yellow containing plastics, green containing glass, orange containing organic waste, and blue containing paper and cardboard. According to informants, the purpose is to improve water use through rationalization, going from waste to responsible use by the educational institution and the community in general, where the school plays an important role in disseminating and responsible environmental education. Planting trees through projects is another request of the informants so that the town of Sayán recovers its environmental greenery of yesteryear and does not continue to be submerged in the generalized contamination.

Prevention is also about developing environmental awareness among citizens. Research by the Ellen MacArthur Foundation (2013) reported that environmental awareness in society is improving, but the aim is to move from a linear economy, characterized by the exploitation of natural resources, production and generation of harmful waste, to a circular economy based on renewable sources of energy and capable of eliminating waste and pollution, the reuse of products and recycling, and the regeneration of ecological systems. Preventive actions through CSR through compliance with legal and economic obligations have low levels of relevance since they are already - or should be - framed in the minimum regulatory standards in companies. This means that CSR is becoming increasingly important in many organizations because it confers competitiveness and comparative advantage. However, implementation in many companies requires allocating greater economic resources, especially in small companies (Mellado, 2009). According to Pernía et al. (2022), CSR must go through a process of transformation, modifying its mission, and changing the attitudes of those who manage it in order to achieve sustainability with the environment and the community; this should be done by companies with an interdisciplinary vision to cover the different angles and without fear of change, achieving a coalition with society.

Category 3: environmental responsibility

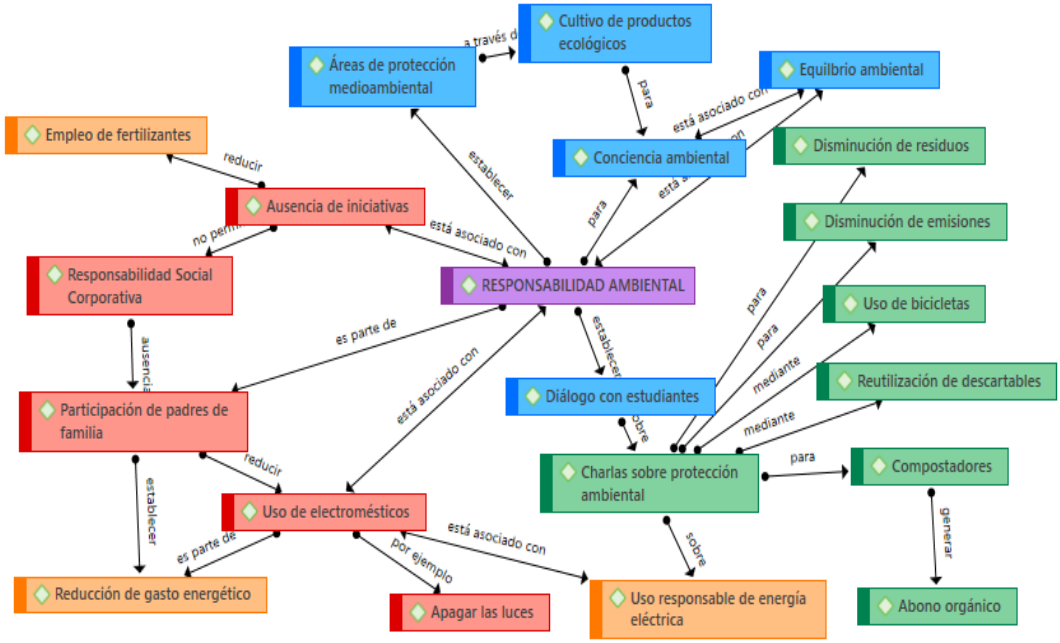

Figure 3. Generating environmental responsibility through education

According to the results, the mission of the educational company is to generate environmental responsibility in its students, parents and community in general; however, environmental responsibility is not being developed effectively by the company following the community in the care of the environment: "I have not been able to observe any initiative on social responsibility" (E4); "For now there are still no initiatives, but we always try to take care of the environment" (E3). In the absence of initiatives at present in which the town of Sayán is in constant environmental pollution that puts at risk flora and fauna, the health of people and other potential consequences, corporate social responsibility of the educational company is required where, for example, the participation of parents and community is a constant to understand the responsible use of electricity; the reduction of fertilizers in the fields; the reuse of disposable materials; the generation of organic fertilizer through the implementation of composters; the use of bicycles and reducing the use of vehicles as much as possible; the cultivation of ecological products and the reduction of the consumption of products that generate environmental pollution. "The company should have an area in charge of environmental protection" (E7). "I would recommend that talks could be held on SR of environmental protection" (E4). Education through companies has the mission to act responsibly towards the environment, and above all, it has the function of training its students and community responsibly from an ecological perspective, developing environmental awareness to establish and restore environmental balance.

These results contradict what Tamayo and Ruiz (2018) argue: the socially responsible behavior of

companies, especially educational ones, is an intangible asset that those who run the organizations and other people involved must take into account, so it is necessary that through modern accounting they must provide socially responsible information for the sake of environmental care. The problem of ecological citizenship translates into the environmental problem, specifically the disconnection with environmental education and the possibility of transcending towards sustainable development. The impact of the huge modern/instrumental rationality on social ways of life has left ravages and traces through the deterioration of nature to such an extent that the planet is in an emergency (Rutti-Marín et al., 2022). People directly involved in companies that carry out business activities in areas of ecological vulnerability must be socially responsible and equipped with technical-scientific instruments, with existential convictions and evidenced solidarity (Menívar, 2020; Rincón et al., 2017). The study by Canahuire and Loaiza (2022) reports that environmental management, in a direct relationship with social responsibility, is an important factor in causing the least possible impact on the environment because the latter factor allows compliance with policies and standards referring to environmental care. In specific terms, voluntary responsibilities on the company's part and due planning in environmental management are necessary factors in caring for the environment.

Category 4: environmentally friendly technology

Figure 4. Use of environmentally-friendly technologies in Sayán

The information and communication technologies are indispensable tools to facilitate work in diverse social fields; they contribute to the care of the environment on the part of the companies,

for example, when using digital forms instead of paper. According to the results of the research, the educational company has managed to reduce the use of paper in the administration itself; however, it has not implemented environmental accounting, whose main nature is to contribute to the care of the environment in its various generative actions; on the contrary, in the company, they make use of traditional accounting or what they call management accounting which is in charge of the administrative process for the operation of the company."... we live in a critical time for humanity and the planet as a whole, our need is to take care of the environment" (E2). The critical era humanity is living in is inconsistent with corporate social responsibility in the town of Sayán because there is no active and sustained participation of the educational company in caring for the environment. It does not apply technology for the preservation of the environment" (E3); "It does not apply because of the reduced space of the educational center" (E4); "It does not apply because of the reduced space of the educational center" (E4). There is a need for greater involvement of society in general in coordination with the educational sector to jointly address the various forms of environmental damage, which includes the ecological education of students and parents, and actively involve civil society with the decisive intervention of the authorities of the various social, cultural, political and economic sectors of Sayán.

Humans are far from applying responsible technologies to mitigate the impact of human activities on environmental pollution. The reality contrasts significantly with those of other countries: technologies are becoming the pillars of an efficient and sustainable environmental management system (Arunkumar et al., 2022). Many researchers have demonstrated solutions to reduce pollution (Battua et al., 2021; Illahi & Mirf, 2021). Artificial intelligence developed in autonomous mobile robots can collect pollution data at specific locations. They perform data collection in a scalable and more flexible way than other techniques. Advanced decentralized technologies, such as blockchain, allow for obtaining data with the best consistency. Data manipulation problems, such as double counting, untrustworthiness and fraud, can be avoided by employing these technologies (Yildizbasi et al., 2021; Li et al., 2020).

IV. CONCLUSIONS

It is concluded that the district of Sayán, located in the province of Huaura, department of Lima-Peru, despite being located in a mostly rural area with little presence of modern urban activities, is polluted, with the presence of solid and chemical waste in the streets, excessive use of fertilizers in the fields, among other highly polluting components; there is an evident worsening if relevant measures are not taken. Municipal ordinances prohibiting irresponsible human environmental actions do not stop air, soil and water contamination rates. The educational enterprise is not effectively complying with the preventive approach and has not implemented environmental accounting, nor is the use of information and communication technologies to support the ever-increasing environmental pollution. People generally show attitudes and behaviors that go against the care of the environment.

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