

Environmental Ethics and Pollution by Tobacco

Jyotsna Lal Ph.D *, Niranjan Swaroop ,

Associate Professor, Department of Chemistry, Christ Church P.G College. Kanpur. U.P.
Assistant Professor, Department of Mathematics, Christ Church P.G College . Kanpur. U.P.

Abstract: *Burning tobacco is the main source of indoor pollution in the developed world. Tobacco smoke contains about 4,000 chemicals including carcinogens, irritants and toxic gases. Nicotine, benzene and benzo(a)pyrene. The gas phase includes carbon monoxide, ammonia, dimethylnitrosamine, formaldehyde, hydrogen cyanide and acrolein. Methyl bromide, an ozone-depleting chemical commonly used to fumigate the soil prior planting tobacco seedlings. Tobacco growers are susceptible to an occupational illness known as green tobacco sickness. This is caused by the absorption of nicotine through the skin from contact with wet tobacco leaves. Nicotine is a risk factor for oral cancer, adult periodontal diseases and congenital defects such as cleft lip and palate in children. Nicotine causes heart arteries to harden, tend to shrink, thickening of blood increases cholesterol deposition leading to heart attack. Smoking causes lung cancer. Breathing other people's smoke is called passive, involuntary or secondhand smoking. The non-smoker breathes "side stream" smoke from the burning tip of the cigarette and "mainstream" smoke that has been inhaled and then exhaled by the smoker. Second hand smoke (SHS) is a major source of indoor air pollution.*

I. Introduction

Environmental ethics is a branch of applied philosophy that studies the conceptual foundations of environmental values as well as more concrete issues surrounding societal attitudes, actions, and policies to protect and sustain biodiversity and ecological systems, considers extending the traditional boundaries of ethics from solely including humans to including the non-human world. It exerts influence on a large range of disciplines including environmental law, environmental sociology, eco theology, ecological economics, ecology and environmental geography.

Environmental ethics builds on scientific understanding by bringing human values, moral principles, and improved decision making into conversation with science. It was Earth Day in 1970 that helped to develop environmental ethics in the US, and soon thereafter the same ethics were developed in other countries including Canada and North America. This is important because the ethics of the environment are of major concern these days. The acts of humans lead to environmental pollution. The stronger demand for resources is also a factor that contributes to the problem as we all need food and shelter. When these things are so desired and need the natural balance of the environment is disturbed. Engineering developments are resulting in resource depletion and environmental destruction. There are several environmental issues that have created havoc on our environment and human life. If ignored today, these ill effects are sure to curb human existence in the near future. Human beings are considered to be the most intelligent species living on earth. This could be why it is the only species on earth which has civilized itself over the decades to a large extent. Today, human beings boast as being superior to all other animals but what is the use of such great intelligence when environment ethics are not followed? Environmental ethics are a key feature of environmental studies that establishes relationship between humans and the earth. With environmental ethics, you can ensure that you are doing your part to keep the environment safe and protected. Environmental ethics believe that humans are a part of society as well as other living creatures, which includes plants and animals. These items are a very important part of the world and are considered to be a functional part of human life. Thus, it is essential that every human being respect and honor this and use morals and ethics when dealing with these creatures. It is the responsibility of all to ensure that environmental ethics are being met. It is somewhat difficult to make adjustments that are necessary to ensure that you are following all environmental ethics. Ethics plays an important role in our society today, and environmental ethics and business ethics must be considered. This has become more prevalent in today's society; environmental ethics studies the relation of human beings and the environment and how ethics play a role in this. Environment ethics has produced around environmental philosophy. Many scientists have taken up the belief of philosophical aspect of environmental hazards thus giving rise to environment ethics. Currently environment ethics has become the major concern for the mankind. The major environmental issues include Overpopulation, Industrial and Household Waste, Acid Rain, Climate change, Ozone Layer Depletion, Urban Sprawl, Genetic Engineering, Deforestation and Global Warming. These environmental issues have taken toll on our environment and we've already started seeing some disastrous effects in the form of effect of health on humans, rise in sea level, depletion of non-renewable resources, melting of glaciers, extinction of species, polluted landfills, toxic dust, decreasing soil fertility, rise in Pollution specially air , soil and water pollution .

II. Pollution By Tobacco

Burning tobacco is the main source of indoor pollution in the developed world. Tobacco smoke contains about 4,000 chemicals including carcinogens, irritants and toxic gases. Nicotine, benzene and benzo(a) pyrene. The gas phase includes carbon monoxide, ammonia, dimethylnitrosamine, formaldehyde, hydrogen cyanide and acrolein. About 95% of the smoke is made up of gases, chiefly nitrogen, oxygen, and carbon dioxide. In experiments, these vapor-phase components are separated from the particulate phase by a glass-fiber filter. The particulate phase contains at least 3500 compounds and most of the carcinogens. There are 55 carcinogens (Table 1, A) in cigarette smoke that have been evaluated by the International Agency for Research on Cancer (IARC) and for which there is "sufficient evidence for carcinogenicity" in either laboratory animals or humans. Other carcinogens not evaluated by the IARC may also be present. For example, among the PAHs, multiple alkylated and high-molecular-weight compounds have been detected but are incompletely characterized with respect to their carcinogenicity. Individual pulmonary carcinogens in cigarette smoke, selected from the classes of carcinogens in Table 1, A, are listed in Table 1, B. The 20 compounds included in this list have been found convincingly to induce lung tumors in at least one animal species and have been positively identified in cigarette smoke. The pesticides commonly used are aldicarb and chlorpyrifos, both highly toxic substances. Methyl bromide, an ozone-depleting chemical, is also commonly used to fumigate the soil prior to planting tobacco seedlings. In 1997, over 5.5 million pounds of methyl bromide were applied to tobacco fields worldwide. The effects of these chemicals are not monitored generally but it is known that they leach into the soil and find their way into streams, rivers, and food chains. These substances may indirectly cause the genetic selection of pesticide-resistant mosquitoes or flies, making the control of diseases such as malaria much more difficult.

Tobacco growers are susceptible to an occupational illness known as green tobacco sickness. This is caused by the absorption of nicotine through the skin from contact with wet tobacco leaves. Symptoms of GTS include nausea, weakness, dizziness and abdominal cramps, and fluctuations in blood pressure and heart rates. It is not known exactly how many tobacco workers are affected by green tobacco sickness but one study of migrant workers in North Carolina USA suggests that 41% of the workers get the illness at least once during harvest season.

Dr Judith MacKay, Director of the Asian Consultancy on Tobacco Control in Hong Kong, claims that tobacco's "minor" use of land denies 10 to 20 million people of food. "Where food has to be imported because rich farmland is being diverted to tobacco production, the government will have to bear the cost of food imports," she points out.

Effect of Chewing Tobacco on the Human Body

Nicotine is a risk factor for oral cancer, adult periodontal diseases and congenital defects such as cleft lip and palate in children. Nicotine causes heart arteries to harden, tend to shrink, thickening of blood, increases cholesterol deposition leading to heart attack. Smoking causes lung cancer. Breathing other people's smoke is called passive, involuntary or secondhand smoking. The non-smoker breathes "side stream" smoke from the burning tip of the cigarette and "mainstream" smoke that has been inhaled and then exhaled by the smoker. Secondhand smoke (SHS) is a major source of indoor air pollution. Among the multiple components of tobacco smoke, 20 carcinogens convincingly cause lung tumors in laboratory animals or humans and are, therefore, likely to be involved in lung cancer induction. Of these, polycyclic aromatic hydrocarbons and the tobacco-specific nitrosamine 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone are likely to play major roles. Molecular epidemiologic studies have demonstrated an association between environmental pollutants and in utero developmental damage. Among the environmental pollutants to which developing fetuses are reported to be vulnerable is environmental tobacco smoke (ETS). ETS is a complex mixture of volatiles and particulate matter comprising numerous compounds, including polycyclic aromatic hydrocarbons (PAHs), which cause oxidative damage. Maternal ETS exposure has been found to be an important risk factor for reduced birth weight, small for gestational age, and premature delivery.

Apart from being a health hazard the economic costs of tobacco use are equally devastating. In addition to the high public health costs of treating tobacco-caused diseases, tobacco kills people at the height of their productivity, depriving families of breadwinners and nations of a healthy workforce. Tobacco users are also less productive while they are alive due to increased sickness.

Effect of Passive Smoking on the Human Body

Some of the immediate effects of passive smoking include eye irritation, headache, cough, sore throat, dizziness and nausea. Adults with asthma can experience a significant decline in lung function when exposed, while new cases of asthma may be induced in children whose parents smoke. Short term exposure to tobacco smoke also has a measurable effect on the heart in non-smokers. Just 30 minutes exposure is enough to reduce coronary blood flow. In the longer term, passive smokers suffer an increased risk of a range of smoking-related

diseases. Non-smokers, who are exposed to passive smoking in the home, have a 25 per cent increased risk of heart disease and lung cancer.] A major review by the Government-appointed Scientific Committee on Tobacco and Health (SCOTH) concluded that passive smoking is a cause of lung cancer and ischemic heart disease in adult non-smokers, and a cause of respiratory disease, cot death, middle ear disease and asthmatic attacks in children. A more recent review of the health impacts of passive smoking by the International Agency for Research on Cancer (IARC) noted that “the evidence is sufficient to conclude that involuntary smoking is a cause of lung cancer in never smokers”. UNCTAD 2004 [4]

Whilst the relative health risks from passive smoking are small in comparison with those from active smoking, because the diseases are common, the overall health impact is large. The British Medical Association has conservatively estimated that secondhand smoke causes at least 1,000 deaths a year in the UK. However, the true figure is likely to be much higher. Professor Konrad Jamrozik of Imperial College London estimated that domestic exposure to secondhand smoke causes at least 3,600 deaths annually from lung cancer, heart disease and stroke combined, while exposure at work leads to approximately 700 deaths from these causes. Jamrozik also estimates 49 deaths – or about 1 a week – from exposure at work in the hospitality trades. In the population aged 65 or older, passive smoking is estimated to account for 16,900 deaths annually. 9,700 are due to stroke, where current evidence of health effects is weakest.[6-30]

Tobacco Use

According to the most recent Government of India’s National Sample Survey data, there are 184 million tobacco consumers in India. About 40% of them use smokeless tobacco, 20% consume cigarettes, and another 40% smoke beedis. Smokeless tobacco use includes pan masala and chewing of tobacco in different forms. Tobacco is also smoked using indigenous devices like hooka, chhutta or dhumti in different parts of the country. Thus, in contrast to the other parts of the world, tobacco is used in a variety of ways in India, which include smoking and smokeless tobacco use. [Gupta.Agarwal2001]

Tobacco use is the most preventable cause of premature death in the US [17, 18] and is responsible for about 30% of all cancer deaths. Cigarette smoking is associated with lung cancer as well as with cancers of the lip and oral cavity, larynx, esophagus, stomach, colon, rectum, pancreas, cervix, bladder, and kidney. Both incidence and death rates from lung cancer are higher among African American men than among white men, even though African Americans begin smoking at an older age and smoke fewer cigarettes per day. Susceptibility to developing lung cancer from smoking may be affected by the type of cigarettes smoked. More African Americans smoke mentholated cigarettes,²⁴ which have been shown to have higher carbon monoxide concentrations than regular cigarettes and may be associated with a greater absorption of nicotine.

An estimated 3,000 young persons begin smoking each day.[Cancer Facts & Figures] For over a decade, African American youth have had the lowest prevalence of cigarette smoking compared with other racial and ethnic groups. According to the Youth Risk Behavior Surveillance Survey (YRBSS) [National Research Council Committee 1986]

Tobacco use is the most preventable cause of premature death in the US Study of youth smoking patterns reflect different aspects of initiation, beginning with experimentation with the tobacco product experimentation and progressing to regular smoking and nicotine dependence. According to Youth Risk Behavior surveillance survey [YRBSS] 40% of High school student currently use tobacco products [cigarettes, chewing tobacco, snuff] And 24.9% had smoked a whole cigarette before age 13 in, more than 34.8% High School smoke cigarettes currently. Worldwide 17.9% male and 15.6 female High school students smoked cigarette frequently [Cancer Facts & Figures2003-04]

In India the study populations included English medium school, Municipal schools and college students, medical students and street children. The prevalence of smoking has been found to vary from 6.9 to 22.5% among the male school and college students. In the observation tables 5 & 6. Among the girls, the prevalence is considerably low varying from 0-2.3%. In fact, tobacco use, especially smoking, is a relatively new habit among the Indian female students, noticed only during the last 10-15 years [Chadda RK, Sengupta SN]

Regardless of race and ethnicity, male students were more likely to use smokeless tobacco than female students, other products smoked by youth include bidis, these are small filter less, flavored cigarettes exported from India bidi smokers inhale more often and deeply due to lower combustibility of the leaf wrapper and breathe in greater quantity of tar and toxins than cigarette smokers. Like all tobacco products bidis cause cancer. [Rohit Sharma2010]

These studies suggest that bezzine like peptides and their receptors play a role in the promotion of lung carcinogenesis. Important differences in susceptibility to lung cancer exist between men and women. The risk for all major lung cancer types is consistently higher in women than in men at every level of exposure to cigarette smoke; odds ratios for an association of lung cancer with smoking are 1.2-fold to 1.7-fold higher for women than for men, depending on the histologic type of lung cancer. Factors such as differences in baseline

exposure, smoking history, or body size do not account for the increased risk, which is likely due to a higher susceptibility to the effects of tobacco carcinogens in women. The airways of females also exhibit a higher degree of bronchial responsiveness to cigarette smoke compared with those of males of all age groups, and airways of females appear more susceptible to adverse effects of cigarette smoke than those of males [Jindal SK, Jha LK.1996] Adolescents and children are the prime targets of the tobacco industry when recruiting new smokers. About 20 million children of ages 10-14 are estimated to be tobacco addicted according to a survey done by the National Sample Survey Organization of the Indian Government. A number of factors influence the use of tobacco by children and teenagers. Some of these are the family history of tobacco use by elders, peer influence, experimentation, easy access to such products, personality factors, underlying emotional and psychological problems, accompanied risk-taking behaviors, and most importantly, the aggressive marketing strategies of the tobacco industry. Adolescents typically become addicted to nicotine while still being teenagers. Usual interval between the first cigarette consumption and daily smoking is 1-2 year(s).Table 3.

Socioeconomic Status

Cancer affects all segments of the population. Lower survival rates and higher mortality; however, often disproportionately affect those of lower socioeconomic status for many reasons, including limited access to health care. more likely to be diagnosed with a later stage of cancer, limited education may be associated with later detection, since the less educated are less likely to know the importance of symptoms that could lead to an early diagnosis. Late detection, in turn, may result in a lower cure rate and shorter survival. Tobacco is the second major cause of death in the world. It is currently responsible for the death of one in ten adults' worldwide (about 5 million deaths each year). If current smoking patterns continue, it will cause some 10 million deaths each year by 2025. Half the person that smoke today that is about 650 million people will eventually be killed by tobacco. Tobacco is the fourth most common risk factor for disease worldwide. [Table3] The economic costs of tobacco use are equally devastating. In addition to the high public health costs of treating tobacco-caused diseases, tobacco kills people at the height of their productivity, depriving families of breadwinners and nations of a healthy workforce. Tobacco users are also less productive while they are alive due to increased sickness. A 1994 report estimated that the use of tobacco resulted in an annual global net loss of US\$ 200 thousand million, a third of this loss being in developing countries. Tobacco and poverty are inextricably linked. [UNCTAD's] Many studies have shown that in the poorest households in some low-income countries as much as 10% of total household expenditure is on tobacco. This means that these families have less money to spend on basic items such as food, education and health care. In addition to its direct health effects, tobacco leads to malnutrition, increased health care costs and premature death. It also contributes to a higher illiteracy rate, since money that could have been used for education is spent on tobacco instead. Tobacco's role in exacerbating poverty has been largely ignored by researchers in both fields.

III. Conclusion

Tobacco is the second major cause of death in the world. It is currently responsible for the death of one in ten adults worldwide (about 5 million deaths each year). If current smoking patterns continue, it will cause some 10 million deaths each year by 2025. Half the person that smoke today that is about 650 million people will eventually be killed by tobacco. Tobacco is the fourth most common risk factor for disease worldwide. The economic costs of tobacco use are equally devastating. In addition to the high public health costs of treating tobacco-caused diseases, tobacco kills people at the height of their productivity, depriving families of breadwinners and nations of a healthy workforce. Tobacco users are also less productive while they are alive due to increased sickness. A 1994 report estimated that the use of tobacco resulted in an annual global net loss of US\$ 200 thousand million, a third of this loss being in developing countries. Tobacco and poverty are inextricably linked. Many studies have shown that in the poorest households in some low-income countries as much as 10% of total household expenditure is on tobacco. This means that these families have less money to spend on basic items such as food, education and health care. In addition to its direct health effects, tobacco leads to malnutrition, increased health care costs and premature death. It also contributes to a higher illiteracy rate, since money that could have been used for education is spent on tobacco instead. Tobacco's role in exacerbating poverty has been largely ignored by researchers in both fields. The WHO Oral Health Programme aims to control tobacco-related oral diseases and adverse conditions through several strategies. Within WHO, the Programme forms part of the WHO tobacco-free initiatives, with fully integrated oral health-related programmes. Externally, the Programme encourages the adoption and use of WHO tobacco-cessation and control policies by international and national oral health organizations. Primary partners are WHO Collaborating Centers in Oral Health and NGOs who are in official relations with WHO, i.e. the International Association for Dental Research (IADR) and the FDI World Dental Federation. There are several ethical, moral, and practical reasons why oral health professionals should strengthen their contributions to tobacco-cessation programmes. The most cost-effective strategies are population-wide public policies, like bans on direct and indirect tobacco

advertising, tobacco tax and price increases, smoke-free environments in all public and workplaces, and large clear graphic health messages on tobacco packaging Lee Jong-wook, WHO 2004 [1]

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Table a- Summary of Carcinogens present in cigarette smoke		
Type	Number of compounds	
Polycyclic aromatic hydrocarbons	10	
Azo-Arenes		03
n-Nitrosoamines		07
Aromatic Amines		03
Heterocyclic Aromatic Amines	08	
Aldehydes		02
Miscellaneous organic compounds	15	
Inorganic compounds		07
Total		55

Table b- Pulmonary Carcinogens present in cigarette smoke		
Carcinogen Class	amount [mg] per cigarette	
	mainstream smoke	sidestream smoke
Polycyclic aromatic hydrocarbons		
Benzo [a] pyrene	20-40	25-35
Benzo [b] fluoranthene	4-22	
Benzo [f] fluoranthene	5-21	
Benzo [k] fluoranthene	6-12	
DiBenzo [a,1] pyrene	1.7--3.2	
Indeno [1,2,3 cd] pyrene	4-20	
DiBenzo [a,1] anthracene	4	
5-Methyl Chrysene	0.6	
Azo-Arenes		
DiBenz [a,b] acridina	0.1	
DiBenz [a,b] carbazole	0.7	
7H DiBenzo [a,g] carbazole	0.7	
n-Nitrosoamines		
n-Nitrosodimethylamines	0.28	< 40
4-[MethylNitrosoamine]		
-1-[3-pyridyl]-butanone NNK	80-770	1-4
Miscellaneous organic compounds		3

1,3 Butadiene	20-70 x 10	
EthylCarbamate	20-38	

Table 2 INDOOR AIR POLLUTIONFACTORS		
A] INDOOR AIR POLLUTIONLEVELS OF NICOTINE		
Billiard parlour	19.4	µg/m3
Home	12.1- 14.4	
Departmental store	0.6	
Automobile	0.4	

B]INDOOR AIR QUALITY			
		Nicotine	µg/
m3			
Restaurants	0.5- 37	average	5.4
average 15	7.1		-37
Offices	3- 48		
average 5	9-32		
Public common areas	6-20		
Smoking sections of airplanes	2-36	1-3	average 15
average 9	6-29	0-112	
Non smoking sections of airplanes	0-40	average 6	
Food counters of shopping malls	1.6- 3.1	average 2.3	

Table 3 Role models' ever seen smoking cigarette by students						n=369
Father	Mother	Brother/Sister	Best friend	Teacher	Favourite celebrity	
132	2	23		63	52	
142						

Table 4 Health risk behaviours concerning tobacco use among adolescents			
Behaviour	males	females	n=369
n=181			
Ever tried cigarette or beedi		68	20
Age at first smoking ≥13y		27	8
Current cigarette/beedi use 1 time in 30 days		34	5
Current heavysmoking		6	0