

# Environmental Impact Of Tobacco Production, Consumption And Disposal – A Comprehensive Review

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## ABSTRACT

*Tobacco causes many health issues that are well known, but consequences on environment are not recognized. The whole world is facing many environmental crises. The natural resources such as water, air and soil are high demands for human survival. Where huge amount of these natural resources are used and polluted during the cultivation and manufacturing of tobacco products. Therefore tobacco threatens the natural resources. Tobacco not just causes air pollution during consumption. The impact of tobacco to the environment is included from cultivation and curing, processing and manufacturing, transportation, consumption and post consumption wastage disposal. We detail the environmental impacts during the lifecycle of tobacco and recommendations that can be implemented.*

**Key words:** Environment, tobacco, cultivation, deforestation , pollution

## INTRODUCTION

Tobacco consumption through smoking or non-smoking form results in severe health problems such as cancer, an autoimmune disorder, diabetes, premature death, lung disease, heart attack, and stroke that can even lead to death. Apart from affecting individually, tobacco is harmful and hazardous to the environment we live in and also the whole ecosystem. Today's tobacco is yesterday's resource and tomorrow's depletion. The impact of tobacco is not just air pollution, but

also leads to the depletion of our ecosystem during the production, consumption and disposal of tobacco.<sup>(1)</sup>

This review article analyses the impacts of tobacco industry on the environment in terms of deforestation, industrial waste, air pollution, soil and land pollution, contamination of waterways, impact on livestock, littering and forest fires. (2)

### **Deforestation**

Tobacco includes 70 species of plants that intensively grow in the rainforest area. The highest production of tobacco is witnessed in China followed by India, Brazil, the USA, and Zimbabwe. Tobacco cultivation started as a small-scale agriculture process which is now extended to large fields that were initially covered by thick forest. In addition to deforestation for cultivation, the cigarette manufacturers need more than 4 miles of paper for rolling, packaging, and woods are burnt for drying the tobacco leaves. (2)

Approximately 2,00,000 hectares of forests are depleted for tobacco farming every year. It is mainly observed in South Africa, the Middle East, South and East Asia, South America, and the Caribbean (3). In India, the overall area of about 4.5 lakh hectares of forest land over 15 states are depleted, such as Andhra Pradesh (45%), Karnataka (26%), Gujarat (14%), Uttar Pradesh(5%), Tamil Nadu (2%), Bihar(2%) and West Bengal (1%) (4)

### **Industrial Waste**

Manufacturing tobacco incorporates an enormous amount of chemicals and toxic substances, which simultaneously generates a tremendous amount of harmful chemical waste (2). As per the report of the International Coastal Cleanup in 2015, tobacco manufacturing industries dispose of 13,12,796 pounds of toxic chemical waste into the ecosystem (5). This solid waste contains a higher amount of toxic nicotine and other substances that can not be recycled. This solid waste is further processed to a liquid state (6).

This effluent water contains nicotine, salts, ammonia, nitrate compounds, flavouring chemicals containing glycogen and alcohol, absorbable organic halogens, and pesticides from tobacco leaves. The report in 1995 has claimed that the global tobacco industry has produced approximately 2.3 billion kilograms of tobacco production waste and 209 million kilograms of chemical waste. These toxins are hazardous to plants, animals, and humans. Marine life is most affected as these toxins reduce the dissolved oxygen level in the water (7)(5).

### **Air Pollution**

The smoking of cigarettes results in air pollution as each cigarette contains 1mg nicotine and 11.2 mg tar, hence the air pollution released during smoking is 10 times greater than diesel car exhaust (8). Second-hand smoking is more dangerous to the environment as it releases carbon dioxide, methane, and other noxious chemicals. Globally 2.6 billion kilograms of carbon dioxide is released due to smoking. These additions of toxic gases result in irregular climatic changes. These gases also induce health issues in animals (2).

Tobacco Industrial processing contributes to a huge amount of air pollution. Tobacco Industries result in air pollution in many ways starting from the machines they use that emit greenhouse gases to the resource used to dry the tobacco leaves which emits chemical burnout gases. The non-renewable resources used in transportation and shipping of the products eventually result in the release of harmful gases<sup>(2)(9)</sup>

## Soil And Land Pollution

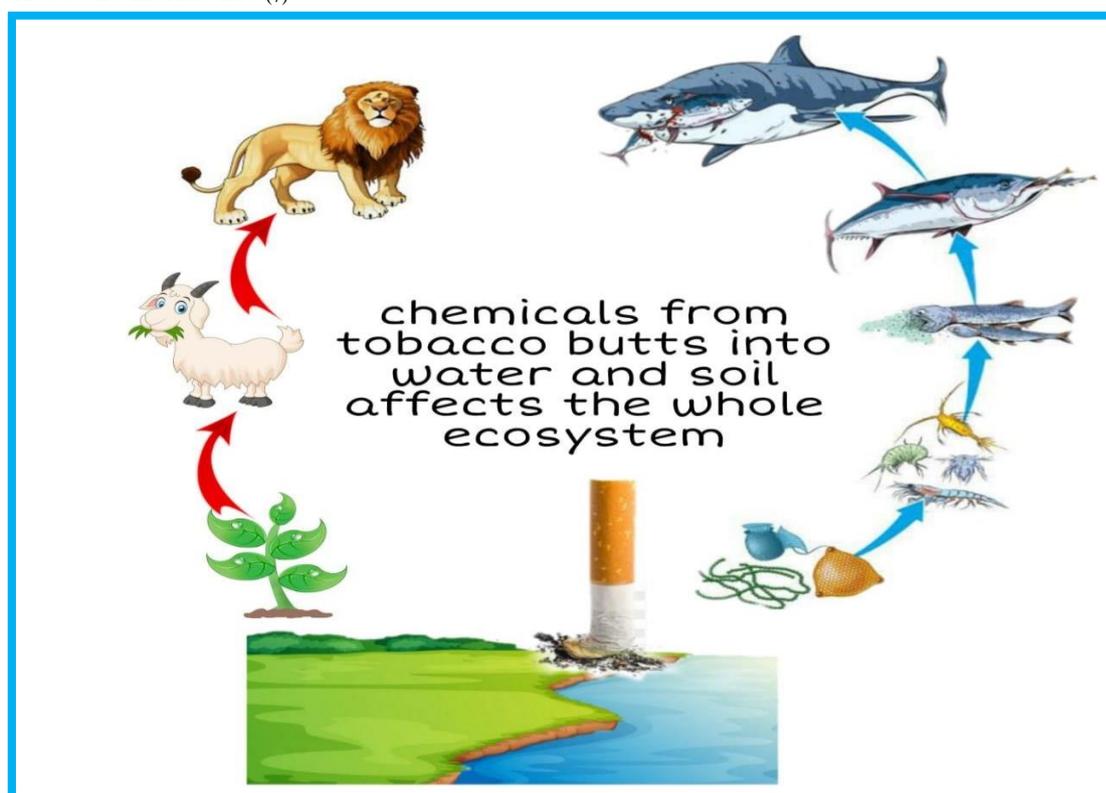
Tobacco plants are single crop or mono-crop where the topsoil is loosely attached to the crop, hence the highly fertile topsoil is poorly protected from water and wind. Therefore the root of the tobacco plant is not strong enough to hold the topsoil that results in wearing away the fertile soil (1). Tobacco plantation requires chemical pesticides and fertilizer in huge amounts which eventually penetrates the soil and affects the quality of underground water (10).

In India, mono-crop tobacco cultivation is reported as the most erosive crop as it drains the land's fertility to zero or sometimes negative as cultivating tobacco for consecutive years reduces the pH of the soil up to 7.44 and organic matter up to 1.78%. Similarly, potassium, phosphorus, Sulphur, and zinc in the soil are also reduced drastically. Tobacco plants take additional nutrients from the soil, which negatively affects the soil fertility. This makes further cultivation of any other crop or even tobacco questionable (11).

## Contamination Of Waterways

Cigarette is composed of thousands of chemicals including arsenic, lead, nicotine, ethyl phenol, ect. Once the cigarette butts reach the water body directly or butt thrown on the ground reach the water through storm water or end up along shorelines or wetlands, all the chemicals in the butts are leaked into the water body that can kill half of all exposed marine life. (12)(2)

The toxicity of these chemicals is not the only concern. The plastic from tobacco packaging and cigarette lighters also affects the water body which causes sea turtles and other marine life to choke and starve.(12).The number of cigarette butts cleared from the water bodies is twice the amount of all other trash, which was reported in 2008 by the international coastal clean-up program. (2) In addition to cigarette butts and their chemicals, the toxic waste from the industries is disposed off in water where it changes the pH of water and reduces the amount of dissolved oxygen which eventually affects the marine life.(7)



### **Impact On Livestock**

The cigarette butts tossed on the ground and water affects the lives of animals. The ecosystem is interdependent on each other, therefore when it affects one species the impact is felt on the other species (13). Livestock is affected by cigarette butts left on the soil surface. Butts leak the chemicals into the soil which is consumed by the plant or grass and get poisoned. It also affects the animals that feed on these plants<sup>(2)</sup>. The journal of agriculture science has reported that tobacco chemicals can kill 100% green apple snail in 2 days by decreasing the dissolved oxygen level and water pH .(14).

### **Littering Environment**

Since the 1980s, the number of cigarette litters collected makes up 30% to 40% of litter collected during coastal clean-up. Approximately 10 billion cigarettes are disposed of in the environment daily. These litters contain 7,000 toxic substances that are considered environmental poisons and carcinogens. (15)(2)

Cigarette filters are made up of plastic fibers called cellulose acetate that is nonbiodegradable i.e., it will not be naturally broken down by living organisms but get broken into small pieces under harmful UV rays from the sun. It takes a minimum of 9 months for cigarette litter to degrade under optimum conditions.

(16)(2).

### **Wildfires**

Worldwide a lot of forest fires have been attributed to irresponsibly discarded burning cigarette butts. These forest fires starting from cigarette butts and lighters results in about 17,000 deaths each year. These forest fires cause a lot of problems to the environment such as biodiversity loss, air pollution, deforestation, climatic changes, and the death of animals and humans. (2).

### **CONCLUSION**

We can conclude that tobacco control intersects with other pressing global issues such as deforestation, air& water pollution, climate change and soil disintegration which are being addressed globally in annual UNFCCC meeting, Sustainable Development Goals (SDG), the Rio+20 environmental commitments, climate change congress, and environmental justice.

The Article has presented evidence to support the case that Tobacco is causing massive harm to the environment and disrupts the ecosystem. By taking immediate and effective action, like assigning liability for the health and environmental hazards created by the tobacco industry, the demand for tobacco products is reduced. Tobacco Consumers, environmental policy-makers, and even smokers do not recognize or realise the environmental impacts wrought by tobacco, due to which the strategies that deserve more recognition, like the environment related convention and laws have not been on the limelight. Raising awareness about these effects of tobacco is the need of the hour. (18)

### **RECOMMENDATION**

1. Ireland was the first country to illustrate with tobacco control law in the year 2004; every country in the world should recognize the effects of tobacco and come up with a strong legislation to monitor and regulate the cultivation and manufacturing of tobacco.

2. All countries should come together and establish a collaborative effort to adopt World Health Organization's "Framework Convention on Tobacco Control" (WHO-FCTC) guidelines that incorporates reduction of tobacco demand, increase the taxes for tobacco, regulating the packaging and labeling of tobacco products, restrict smoking in public places.<sup>(17)</sup>.

3. The Dry Ice Expanded Tobacco (DIET) is a alternative process of tobacco product manufacturing, which reduces the amount of tobacco used in making one cigarette by pumping CO<sub>2</sub> under high pressure. By following this process of production it reduces the manufacturing costs, agricultural demand on tobacco leaves and the use of natural resources.(9)
4. Identify the health effects, spread awareness, treat, and regularly monitor the health of farmers and workers engaged in the tobacco cultivation and cigarette manufacturing industries.
5. Regulate the data and information about the production and distribution of tobacco products. the responsibility of their effects on the environmental and health risks has to be shared by tobacco manufacturers.
6. Adopt 'producer responsibility' regulations which require the tobacco producers to finance independently established and managed organizations to prevent, reduce and mitigate tobacco product waste.
7. Strict laws and tax policies has to be enforced on tobacco products and its sales in order to eliminate single-use filters.

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