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Stubble Burning Industry Contribution to Clean Environment by used of Stubble as a Flame

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Abstract: *Stubble burning has been reckoned among the major contributors of air pollution especially in South Asia. It is a significant source of gaseous pollutants such as, carbon dioxide (CO2), carbon monoxide (CO), nitrogen oxides (NOx), sulfur oxides (SOx), and methane (CH4) as well as particulate matters (PM10 and PM2.5) causing serious damage to human health and the environment. It was reported that the burning of 63 Mt of crop stubble releases 3.4 Mt of CO, 0.1 Mt of NOx , 91 Mt of CO2 , 0.6 Mt of CH4 and 1.2 Mt of PM into the atmosphere. The situation is more austere in India due to the intensive rice-wheat rotation system which generates large amount of stubble. It was estimated that about 352 Mt of stubble is generated each year in India out of which 22% and 34% are contributed by wheat and rice stubble respectively. About 84 Mt (23.86%) of the stubble is burnt on-field each year immediately after harvest. The disastrous haze observed over India during the winter season has been linked to stubble burning as it coincides with the burning periods (OctoberNovember). During this time, most Indian cities, especially within the National Capital Region (NCR) experience harsh pollution often reaching the severe levels of the air quality index (AQI). In November 2019, Delhi recorded a peak AQI of 487, Ghaziabad reported an AQI as high as 493, and Greater Noida recorded 480. The health effects of air pollution ranges from skin and eyes irritation to severe neurological, cardiovascular and respiratory diseases, asthma, chronic obstructive pulmonary disease (COPD), bronchitis, lung capacity loss, emphysema, cancer, etc. It also leads to an increase in mortality rates due to the prolonged exposure to high pollution. The Energy and Resources Institute (2019) reported that in 2012, air pollution had led to about 5 million deaths in South Asia which is around 22% of the total deaths in the region. In addition to its effects on air quality, stubble burning also affects soil fertility (through the destruction of its nutrients), economic development and climate. The crop stubbles (if managed properly) could provide immense economic benefits to the farmers and protect the environment from the severe pollution. Some of the alternative management practices include the incorporation of the stubble into the soil, use of stubble as fuel in power plants, use as raw material for pulp and paper industries, or as biomass for biofuel production. It can also be used to generate compost and biochar, or as blend for the production of cement and bricks. Most of the farmers in North Stubble burning industry contribution to clean environment by used of stubble as a flame India are not aware of the prolific alternatives for managing stubble and, therefore, consider burning as the best option. This necessitates the need for immense awareness programs to enlighten the farmers about the availability of economically feasible options and the composite effects of stubble burning.*

Keywords: Stubble, Burning, Pollution, Straw.

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