

A Review on Problem of Paddy Stubble Burning in Punjab and Haryana

Satish Kumar^{1*} and Vijayanti Jakhar²

¹Department of Botany and ²Zoology

CMG Govt. College for Women, Bhodia Khera, Fatehabad, Haryana, India

*Corresponding Author E-mail: drsatishverma1008@gmail.com

Received: 25.02.2020 | Revised: 29.03.2020 | Accepted: 4.04.2020

ABSTRACT

Around 28.1 million tons of paddy stubble was produced in Punjab and Haryana but 42.21 % of it was burnt illegal in open fields of these two states in months of October & November of year 2018 while 59.79% was successfully utilized for soil fertility or other measures. Main reasons of paddy stubble burning includes short gap period between paddy crop harvesting and wheat crop cultivation; non-availability of migrant labour due to MNREGA scheme in their home states; increased mechanization to harvest crop and lack of proper planning by state authorities for farmers. Large scale burning of paddy crop residues in fields produces dense smog which is responsible for around 80% increase in incidences of road accidents and more than 60% increase in patients with respiratory problems. Paddy stubble burning produces greenhouse gases, toxic gases, aerosols, smoke, organic compounds and particulate matter in the air. Burning also decreases the soil quality and increases the cases of fire accidents. Paddy stubble burning is directly concerned with human health hazards including asthma, allergy and other respiratory problems. Pollution level reaches at alarming level in national capital region of Delhi during October and November months. National Green Tribunal has recommended satellite based monitoring of paddy stubble burning cases and Deputy Commissioners are given power to register cases against the culprits. No doubt, paddy stubble has many uses like fodder for cattle, household fuel, formation of compost, manufacturing of paper & board, mushroom cultivation, bedding for cattle, bio-thermal energy production etc. There is great need that state governments should provide subsidy to the farmers on purchase of agriculture implements to harvest paddy crop residue, should purchase crop residue direct from fields and should bring awareness among farmers about harmful effects of crop residue burning by organizing camps, trainings, workshops etc. In short, policymakers & pollution control authorities must focus to solve the problem of paddy stubble burning in Punjab & Haryana.

Keywords: Paddy stubble, Crop residue, Respiratory problems, Pollution, Health hazards.

Cite this article: Kumar, S., & Jakhar, V. (2020). A Review on Problem of Paddy Stubble Burning in Punjab and Haryana, *Ind. J. Pure App. Biosci.* 8(2), 233-237. doi: <http://dx.doi.org/10.18782/2582-2845.7994>

Every year, paddy crop stubble is burnt in the fields of Punjab and Haryana in the month of October and November (Gupta, 2019). About 28.1 million tons of paddy stubble in Punjab and Haryana was produced in year 2018, most of which was burnt by farmers in the open fields because they want to clear the field quickly for the next crop of wheat⁷. Modernization of agriculture and non-availability of farm labour are also major factor of paddy straw burning. Thick black smog covers the area during burning and is responsible for health problems and environment degradation (Kumar et al., 2015). Particulate matter in smoke has adverse effect on lungs of children (Alder, (2010). Paddy straw has many uses like animal fodder, composting, mushroom bedding etc. and it is also incorporated as nitrogen mineral in soil (Singh et al., 1992). According to NASA maps Report, the number of cases of paddy straw burning has reduced to 50% and 55% in Punjab and Haryana respectively since 2016. Though, the straw burning cases has reduced in last four years yet there is urgent need to solve the problem of paddy stubble burning to reduce pollution level & fire cases in Punjab and Haryana.

REASONS OF PADDY STUBBLE

BURNING BY FARMERS

Farmers of Punjab and Haryana burn around 80% of paddy straw in open fields². The main reasons observed for this problem are-

- Farmer's income has increased and they prefer to use combine harvesters to cut the paddy crop.
- Farmers want to save time and labour cost of uprooting the paddy stubble.
- There is less time gap between paddy harvesting and wheat crop growing and farmers have to prepare their fields for next crop quickly.
- Number of migrant farm labour from Uttar Pradesh and Bihar has declined because

they have availability of work in their states in MNREGA scheme.

- Burning kills the pests and weeds of the field, so cost of insecticide is reduced.
- High cost of tillage uprooting and less demand of paddy stubble divert the farmers towards burning of crop residue in the open field.

EFFECTS OF PADDY STUBBLE

BURNING

- Paddy stubble burning is a serious matter of concern in Punjab, Haryana & Delhi (Mittal et al., 2009). It produces greenhouse gases (CO₂, CH₄, N₂O), toxic gases (SO_x, NO_x, NH₃, CO), aerosols and particulate matter.
- Air Pollutants cause severe health problems like asthma, allergies, bronchitis and eye irritation (Urmila, 2017).
- Stubble burning adversely affects the soil quality. Carbon & Nitrogen loss is almost 100% while phosphorus (25%), Potassium (20%) and Sulphur (50%) also destroyed significantly (Yadav et al., 2017).
- Sprayed insecticide (around 98%) and herbicide (around 95%) also come in the air as pollutant due to paddy stubble burning and adversely affect the sensitive animal species.
- Dense smog reduces visibility thus road accidents are increased.
- In many cases, fire spreads in nearby areas and cause heavy loss of property & life.
- Electrical and electronic equipments in the field may get damaged due to uncontrolled fire flames.
- Beneficial microbes and insects also get killed due to burning of crop residue.

ALTERNATIVE USES OF PADDY

STRAW

- Paddy stubble has high silica content and is a good fodder for cattle in Punjab and Haryana.

- Paddy residue may be used to produce electricity in Bio-thermal Power Plants. First Plant in India is established at Jalkheri (Punjab) and producing 100 MW electricity.
- Paddy stubble bedding for cattle during winter season enhances the production of the milk.
- Paddy straw is being used to grow mushrooms like *Agaricus bisporus*, *Volvariella* and *Volvacea* species.
- Wheat and paddy straw mainly in 40:60 ratios are used in manufacturing of paper.
- Paddy straw is also used in Bio-gas production.
- Paddy stubble can be mixed in the soil to increase its fertility and also help in recycling of soil. Due to mixing of paddy straw in clay loam soil before 3 weeks of wheat sowing, increased the wheat production in Sonapat district (Singh et al., 1992).
- Paddy straw is used to produce Bio-oil through rapid pyrolysis technology. It is petroleum like liquid which may be used in boilers and gas turbines.
- Paddy stubble mixed with clay is used to make bricks.
- Govt. should purchase the paddy stubble from farmers and establish a market place for crop residue purchasing.
- Govt. should provide subsidy to farmers to purchase the machines like Happy Seeders, Rotavators etc for uprooting of tillage and collection of crop residue.
- Govt. should organize Kissan Camps, Training & Workshops for farmers to make them aware about the harmful effects of crop residue burning.
- Govt. should establish Biomass-based Power Plants to utilize paddy straw.
- Farmers should be motivated to grow alternate crops to reduce the crop residue in the fields.

RESULTS AND DISCUSSION

Report of the committee on Review of the Scheme “Promotion of Agricultural Mechanisation for in states of Punjab, Haryana, Uttar Pradesh and NCT of Delhi” published by Ministry of Agriculture and Farmers Welfare in May 2019, reports that out of total 28.1 million tons of paddy stubble produced in year 2018, around 11.3 million tons was burnt in open fields. Due to efforts of government of India and Awareness Campaign, the paddy residue burning incidences has come down in both Punjab and Haryana States. In Punjab, the number of burning cases has reduced from 51150 in 2016 to 26260 in 2019 while in Haryana, the cases has decreased from 13378 in 2016 to 6060 in 2019. The decline in stubble burning cases was around 50% in Punjab and 55% in Haryana (Kapil, (2016) (Fig. 1). The utilization of paddy stubble in industries and power plants has motivated the farmers to avoid its burning in the fields.

EFFORTS TO REDUCE PADDY STUBBLE BURNING

- Crop residue burning is banned by Govt. of India as it is an offence under the Air Act of 1981 and the code of Criminal Procedure, 1973.
- Govt. should take the help of technologies like Remote Sensing for monitoring and prevention of crop residue burning.

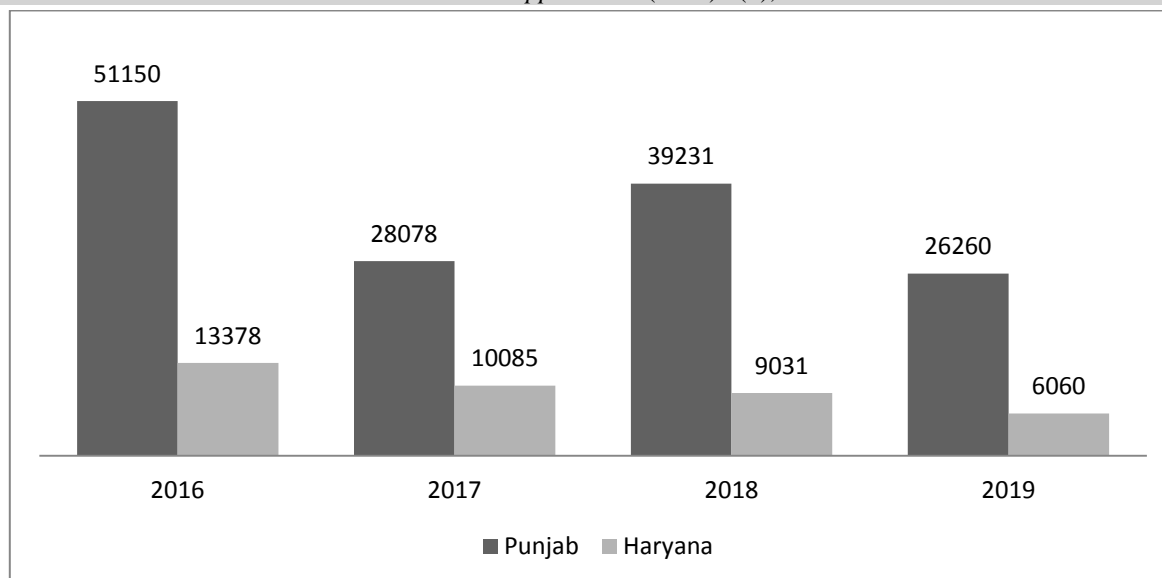


Fig. 1: Number of Paddy Stubble Burning events (1 Oct.-30 Nov.) NASA Maps

CONCLUSION

Paddy stubble burning is the major issue of concern particularly in the month of October and November every year. Though, the number of fire cases has decreased in the last four years, but still its level is alarming to health. Dense smog due to burning has an adverse effect on human health, road safety and causes pollution in the environment. Paddy stubble has many uses but there is a great need to bring awareness among farmers about the adverse effects of paddy stubble burning. Though, Govt. of India has legally banned the crop residue burning, the farmers and public must also take the responsibility to control this problem. Govt. should also help the farmers by providing them subsidy and loan to purchase agriculture implements and should ensure the purchasing of crop residue from fields.

REFERENCES

- Alder, T. (2010). Respiratory Health: Measuring the health effects of crop burning 118(11), A475. available on <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2974718>.
- Gupta, R.K., Narsh, R.K., Hobbs, P.R., Jiaguo, Z., & Ladha, J.K., (2003). Sustainability of Post-green Revolution Agriculture: The Rice-wheat cropping systems the productivity and sustainability of Rice-wheat systems: Issues and Impact, *ASA special publication, Wisconsin USA*, 65.
- Gupta, R. (2004). The Economic causes of crop residue burning in western Indo-Gangetic plain. *Current Science*, 87(12), 25.
- Kapil, S. (2019). Stubble burning down in Punjab, Haryana, UP since 2016: NASA maps from downtoearth.org.in/news/air/stubble_burning.
- Kumar, P., Kumar, S.K., & Joshi, L. (2015). Socio economic and environmental implications of agricultural residue burning. *A Case study of Punjab, India*, 137.
- Mittal, S.K., Susheel, K., Singh, N., Agarwal, R., Awasthi, A., & Gupta, P.K., (2009). Ambient air quality during wheat and rice crop stubble burning episodes in Patiala. *Atmospheric Environment*, 43, 238-244.
- Singh, S., Batra, R., Mishra, M.M., Kapoor, K.K., & Goyal, S. (1992). Decomposition of paddy straw in soil

- and the effect of straw incorporation in the field on the yield of wheat. *Journal of Plant Nutrition and Soil Sciences*, 155(4), 307-311.
- Urmila, (2017). Crop burning against the environment. *International Journal of Humanities and Social Science Research*, 3(8), 16-19.
- Yadav, S., Koli, P., Mina, S., & Devi, S. (2017). Crop residue burning and air pollution. *Popular Kheti*, 5(2), 105-109.