

ABSTRACT

SMOG LOCKDOWN

Introduction

How India breathes: Tale of two Halves

India breathes in the two halves.

North India is landlocked with still air and with very little chance of air circulation, except for the gusty / dusty strong wind blowing from the Rajasthan desert. Very hot blow of wind during the summer and very cold blow during the winter. This in contrast to South India, which is a peninsula, flanked by the Arabian Sea on the West and the Bay of Bengal on the East and Indian ocean on the South. This is a very big advantage for the Southern peninsula to get blown and rinsed by the winds and rain that normally occur very frequently..

The stubble burning by the farmers, the high pollution caused by the heavy vehicular traffic, the vast quantities of industrial and domestic emissions let of into the air chokes Delhi and other cities like Ahmedabad, Lucknow etc. Of all the cities, Gurgaon in Delhi is the worst affected.

Delhi's Smog Lockdown is linked to the stubble burning by the farmers of the state of Punjab and Haryana .

Globally, residue burning is significantly higher in Asia compared to other continents. The rice- wheat growing belt of South Asian countries is a global hotspot of stubble burning and the same is true for India. The north-western states, especially Punjab, Haryana and Uttar Pradesh witness the burning of paddy straw by farmers.

The problem continues as by that time a lot of smog is in the air, choking the citizens, causing very poor visibility leading to lot of accidents in Delhi and surrounding areas, causing a number of flight cancellations etc. not taking in to account a lot of breathing disorders, fatigue and breathlessness reported by the citizens of Delhi.

Background/ Context and Literature Review

1. Depletion of ground water:

The level of groundwater utilization is relatively high in the river basins present in the North-Western region and parts of South India. The groundwater utilization is very high in the states of Punjab, Haryana, Rajasthan, and Tamil Nadu.

Water level is going down by nearly one metre every year in Punjab and nearly 80% of the state's area is becoming a red zone because of the overuse of groundwater. Groundwater extraction in Punjab has already reached 150-200 metres in most places in central Punjab. If the present depletion continues, in most parts of the Punjab state, groundwater is being overexploited for irrigational purpose.

Apart from this water scarcity or depletion problem, water quality is also being deteriorated and not suitable for drinking purpose. The major cause of land degradation in Punjab is due to over-irrigation. Over-irrigation leads to waterlogging which in turn leads to an increase in alkalinity and salinity in the soil. Western Uttar Pradesh and Haryana also face land degradation due to over-irrigation. The ill effects have uniformly affected all regions in the world. Punjab is no exception.

The reasons are - Lack of proper planning of systematic groundwater extraction, change in cropping pattern, increase in number of tube wells, decline in canal irrigated area in paddy-dominated Central Punjab, decrease in average annual rainfall.

2. Role of the Green Revolution

The green revolution led to high productivity of crops through adapted measures, such as increased area under farming, double-cropping, which includes planting two crops rather than one each year, adoption of High Yielding Variety of seeds, highly increased use of inorganic fertilizers and pesticides, improved irrigation facilities, improved farm implements and crop protection measures and modifications in farm equipment.

3. Current cropping patterns in Punjab

Primarily the main crops grown in Punjab are Wheat and Rice.

82.2% of the total geographical area of Punjab is irrigated and the cropping intensity is 204%. The cropping pattern has shifted from cotton, maize, oilseeds and pulses to paddy.

Punjab Agriculture University (PAU) show that every kilogram of paddy requires roughly 5,000 litres of water. PAU's studies also highlight the fact that Punjab consumes fertilisers at 190.1 kg per hectare, much higher than the national average of 88.2 kg per hectare. Due to excess usage of chemical groundwater is severely damaged.

Farmer's Love for Long duration crops: The farmers prefer longer duration (unrecommended) varieties give them more yield than the short duration varieties approved by the PAU. They claim that they get an yield ranging from 34 to 37 quintals per acre from long duration varieties.

Farmer's Ignorance: The farmers ignore the high input cost in growing the long duration rice varieties which are a foot longer and generate more stubble. Most of the farmers in the rice-wheat growing region of the country use combine harvesters for planting and harvesting the crops. These harvesters generate a huge amount of stubble (around 9 tonnes per hectare) consisting of tall stalks, up to 30 cm high, which are difficult to incorporate into the soil

4. Government Policies

The stringent Preservation of Subsoil Water Act, enacted in 2009, prevents the farmers in Punjab and Haryana from planting pre-monsoon paddy crop during April-June and they can only grow paddy around mid-June. Consequently, while they were able to harvest paddy by early October before the Act came into force, they are now only able to do it between late October and mid- November. This leaves them a shorter time window to harvest as well as prepare the field for the rabi crop (wheat), which is why they burn stubble instead of choosing eco-friendly options.

5. Recommendations of FAO - Climate and Clean Air Coalition

Since 2019, the Food and Agriculture Organizations of the United Nations (FAO) has carried out a Climate and Clean Air Coalition project in Punjab to identify how crop residue can be used on farms and in other ways that are environmentally sustainable and economically viable for farmers and entrepreneurs.

Crop residue has many practical uses, including for the production of green energy, which would contribute significantly to India meeting its Nationally Determined Contribution(NDC) targets and combatting climate .

Research Aims: To render workable solution to the persistent problem of stubble burning suitable to all stake holders by addressing the root causes to prevent stubble burning and improve the poor quality of air thus protect the health of the scores of citizens of the states of Haryana, Punjab and Delhi.

Research Methods

Explores various options to combat this problem and Recommends Improvement of ground water by a unique “JAL TARA project of ART OF LIVING” – a simple, affordable but very effective method to improve the level of ground water.

Pre monsoon sowing which includes raising nursery just after the premonsoon showers (showers received before the onset of the monsoons)

This will enable the farmers to have more time between the two crop seasons , this window will help to have more time to dispose of the stubble and then sow the next crop.

2. It also highlights the benefits of growing short duration paddy varieties which give equal or more yield than the long duration varieties thus enabling the farmer to have a bigger window of time to dispose of the stubble.

Expected Deliverables

Improvement in level of ground water which will enable farmers to sow early, harvest in time and dispose stubble without burning and causing the air pollution.

Suitability for Research

This is suitable for research as stubble burning is an issue all-over South and south east Asia. Fresh and clean air is the a necessity for life on the planet. Air pollution and Accumulation of Carbon monoxide, CH₄ and CO₂ in the atmosphere , CO mainly responsible for effecting the amount of Greenhouse gases which are linked to global warming and climate change that is threatening the lives and livelihood of men.

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