

# **CROP DIVERSIFICATION TO SOLVE AIR POLLUTION AND WATER SCARCITY CAUSED BY AGRICULTURAL PRACTICES**

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## ABSTRACT

**Our lives depend on agriculture. Providing food to about 8 billion of the world's population, demands extensive and productive agriculture. In some cases, agricultural practices and their waste can cause environmental and social issues. A few regions of India are now facing such problems like reduction in air quality, and shortage of groundwater.**

**India's national Capital-Delhi is under the grip of severe air pollution. A part of this pollution is being attributed to stubble burning in the neighbouring states of Punjab and Haryana. The stubble is the remnant of Kharif paddy grown and harvested by combine harvester in the mentioned states. Scientists are working to find out effective ways to decompose or even use paddy stubs for several environmentally friendly uses and have already had quite a few breakthroughs. This article attempts to look at this from a different perspective.**

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# INTRODUCTION

The only silver lining in the estimates of the first quarter (April-June) of GDP, in 2020 by the National Statistical Office of India, was the Agriculture sector. But while this growth gives us significant reason to celebrate, it may not be too far-fetched to say that continuing current agricultural practices would not lead to a sustainable future. India is still stuck with the idea of higher yields being the only motto of crop production. This fight to achieve quantity by hook or crook has given rise to the problem of plenty, compromised the quality of produce and led to overexploitation of natural resources. In a world that is increasingly aware of the idea of sustainability, caring for the environment is the need of the hour. It is therefore imperative that we grow out of the rules of the Green Revolution and move towards an Ever-Green Revolution. The solution is to move from monoculture to diversification, from overexploitation to conservation. But diversification can be difficult. It requires addressing the agronomic issue, transfer of information to farmers, developing connections in marketing and installing new processing and handling facilities (Lockeretz, 1988). The onus, therefore, to encourage this shift lies on the shoulders of the Indian Government by policy changes.

## DISCUSSION

In the era of Green Revolution, Punjab and Haryana shifted to a rice-wheat cultivation cycle. Rice, a semi-aquatic plant, was not a traditionally grown crop in this region but has now replaced traditional crops like maize, bajra, oilseeds and pulses. All these crops are completely dependent on irrigation and the resultant depletion of the water table was unavoidable.

In Spite of this heavy load on the environment -

farmers were attracted towards rice as it guarantees a Minimum Support Price (MSP), a convenience not available with traditional crops. The present wheat-rice cropping pattern, groundwater irrigation, procurement policy, and electricity policy have bound the farmers in Punjab into a convenient yet vicious relationship that is economically and ecologically unsustainable (Sarkar and Das, 2014).

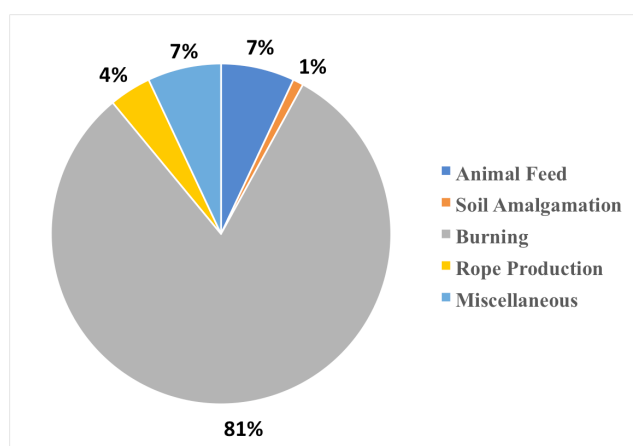
The Sub-Soil Water Prevention Act, 2009 did not allow farmers to sow paddy before the notified date and resulted in late sowing. After harvesting, there was hardly any time left to clean the field before sowing the Rabi wheat. Stubble burning was the fastest way to get rid of remnants in the field and clear it just in time for sowing the next crop. Therefore, burning of straw has been the most convenient and common practice (Figure 1). Year after year this cycle has culminated in severe air pollution. Burning of farm residue emits various trace gases, such as carbon dioxide, carbon monoxide, methane, nitrogen oxides, and sulphur oxides, as well as huge quantities of particulate matter, including PM of 10 microns or less and 2.5 microns or less, into the atmosphere, causing negative impacts on human health and exacerbating global warming (Singh, 2018).

This is a case in point that the heavy load on the environment due to artificial ecosystems can be very harmful in the long run. Although agricultural development is largely irreversible, the cyclic nature of both climate and the agricultural economy also guarantees that old problems never go away completely. Therefore, old approaches are not necessarily irrelevant, no matter how much has changed meanwhile (Lockeretz, 1988). To go back to traditional crops can harmonise agriculture with the balance of nature.

Government figures show that Food Corporation

of India procurement has far exceeded the buffer stock limit and by January 1, 2021, India will have food grain reserves 2.7 times more than that is required (Mohan and Dash, 2020). Considering these facts, the most logical step will be to diversify to crops other than food grains such as high value horticultural crops.

Low water requiring crops such as desi cotton, pearl millet, gram etc., and maize based cropping system in high rainfall areas can substitute rice. Using this approach, the area of the rice based cropping system can be reduced from present 24.7 lakh ha to 19.6 lakh ha, thereby reducing the degradation of valuable land and water resources (Ray *et al.*, 2005).



**Figure 1:** A major portion of the paddy straw is burnt. Source: Punjab State Council of Science and Technology, Chandigarh, India.

Economic policy incentives for the production of monoculture row crops under intensive management have outweighed the perceived incentives to implement diversified farming systems (Lin, 2011). Agricultural diversification will work only if the current system of procurement based on minimum support price (MSP) is changed in favour of new crops because it provides a powerful economic incentive to prolong the wheat paddy rotation (Singh, 2004). Urgent policy intervention by the government on these lines with good price remuneration and assured market for alternative crops that are at par with the ones given for rice and wheat are required.

Direct benefit transfer to the farmers' bank accounts, instead of subsidies, will improve their purchasing power and provide the initial financial support required for the switch. Training of farmers about cropping patterns and sustainable irrigation practices is also needed.

## CONCLUSION

Farmers have an unparalleled interdependence with nature. But for their subsistence agriculture needs to be profitable. Therefore, they cannot and must not be blamed for the load on the environment due to prevalent farm practices in our country. It is only fair to convince them to switch to environment friendly options and practices when the options given are viable and profitable at par with the current practices.

Training, sensitisation and careful planning of policies that discourage monocropping and incentivise diversification are the only way that Indian Agriculture can survive without consuming all the rich natural resources that we are blessed to have at our disposal.

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