



VISION: CLEAN SKIES FOR PUNJAB



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Introduction

The Center for Study of Science, Technology and Policy (CSTEP) has been actively involved in finding solutions to air quality issues across India. The Centre for Air Pollution Studies (CAPS) at CSTEP is currently conducting a long-term study in Punjab to identify air pollution challenges and devise sectoral strategies for reducing air pollution in the state. CAPS is carrying out hybrid measurements and policy analysis for providing solutions to air pollution arising from stubble burning, industries, and transportation. To expedite the identification of interventions and policy measures, CAPS organised a stakeholder engagement event 'Vision: Clean Skies for Punjab' on 9 December 2021 at Chandigarh. The event brought together stakeholders from government, industry, civil society, and academia to deliberate on the effectiveness of current policy measures in Punjab for reducing air pollution and suggest a way forward.

Objectives of the event



► *Understand the activities contributing to air pollution in the state*

◀ *Build an effective policy mechanism*



► *Create awareness among farmers*

◀ *Identify control measures for transportation and industrial sectors*



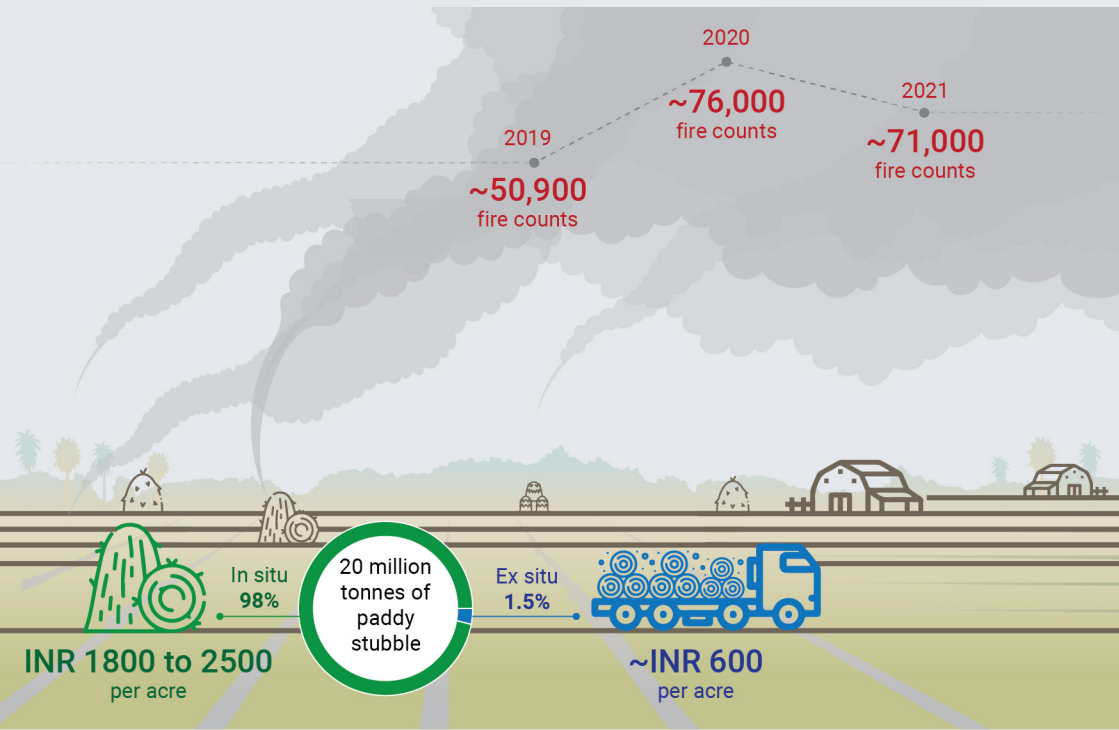
► *Build capacity and create awareness about the use of low-cost sensors for measuring particulate matter concentrations*

Punjab is always in the news during the winter season because of stubble burning. Stubble burning increases air pollution in Punjab and the neighbouring states, impacting human health adversely. Industries and transportation also contribute heavily to air pollution in the state. These issues were discussed in depth during the event, and the major talking points are presented in this policy brief.

Stubble Burning

Around 3 million hectares of land are under rice cultivation in Punjab, which generate approximately 20 million tonnes of residue. Similarly, approximately 3.5 million hectares of land are under wheat cultivation, which generate over 19 million tonnes of wheat residue every year. Out of the 20 million tonnes of paddy stubble, only 1.5% is managed ex situ, while around 98% is either managed in situ or burned. With the increase in diesel prices, deploying in-situ management machineries has become costly for farmers (INR 1800 to 2500 per acre), whereas ex-situ management is relatively less expensive (~INR 600 per acre).

The number of fire counts reported in Punjab in 2019 was ~50,900 and 2020 was ~76,000. The fire count reduced to 71,000 in 2021, marking a 13% reduction compared to 2020. The area burned also reduced by 22%. However, the reduction is marginal considering the steps taken. In the last four years, the central government has provided subsidies of around INR 1050 crore to Punjab, of which INR 235 crore was released in the financial year 2021–22. Approximately 80,000 crop residue management machines (happy seeder, rotavator, super seeder, zero tiller) have been distributed to farmers in the last 3 to 4 years, but more are needed.



Challenges



Lack of transport mechanisms at the village level for ex-situ crop residue management (CRM)



No timely incentives to farmers for CRM



Focus on short-term policy measures for stubble management



Lack of information on alternative crops to rice and wheat



Lack of information and awareness on minimum support price, economic benefits, demand, market volatility, and so forth



No clarity on the functioning of cooperative societies



Under-developed digital infrastructure for managing crop residues



Lack of access to improved technology for harvesting

Interventions



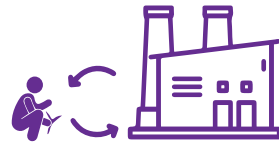
Developing long-term policies for in-situ and ex-situ CRM



Establishing market mechanisms for selling crop residue at the village level



Creating stubble storage facilities at villages/districts



Connecting farmers with nearby industries



Digitising the functioning of cooperative societies



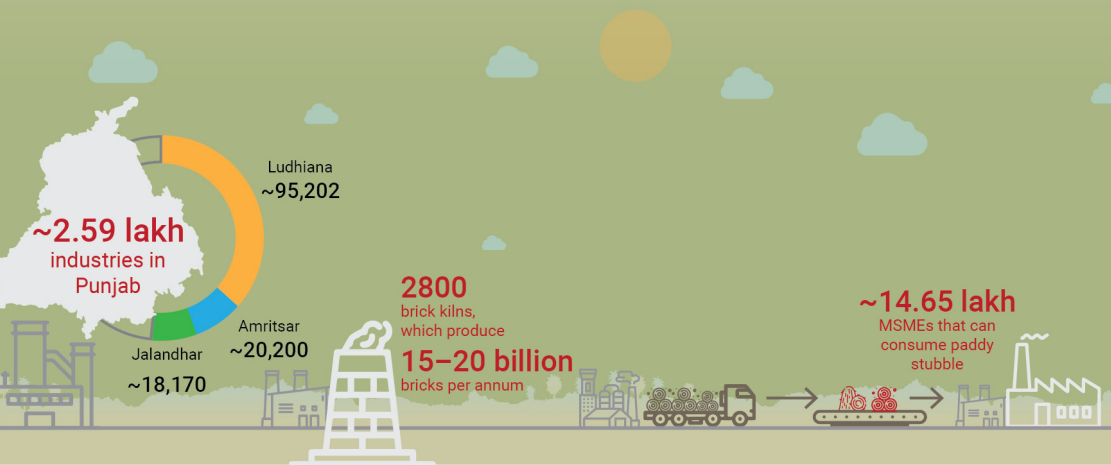
Encouraging private entities to adopt villages for CRM

Industries

In Punjab, there are ~2.59 lakh registered industries. Ludhiana has ~95,202 industrial units, followed by Amritsar with ~20,200 units and Jalandhar with ~18,170 units. Industries such as brick kilns, food processing, metallurgy, automobiles, rolling mills, and textiles flourish in the state. But most of them emit suspended particulates, oxides of nitrogen and sulfur, organic compounds, and other pollutants into the air.

There are around 2800 brick kilns in the state, which produce approximately 15–20 billion bricks per annum, making up about 8% of the total production in the country. During the event, Mr Krunesh Garg, the Member Secretary of the Punjab Pollution Control Board (PPCB), stated that due to the increased adoption of zigzag technology in brick kilns, there has been a reduction of CO and SO₂ by around 4 lakh metric tonnes and 15,000 metric tonnes, respectively, in a year.

The micro, small, medium enterprises (MSMEs) sector has emerged as a highly vibrant and dynamic sector in Punjab's economy. There are ~14.65 lakh MSMEs in the state, which can consume paddy stubble and help solve the stubble burning challenge. This huge potential needs to be explored further, and studies need to be conducted to assess the use of stubble as an efficient fuel in these industries. Alternative utilisation of paddy stubble for making artefacts, sarees, paintings, and so forth, can also be explored by start-ups and MSMEs.



Challenges



Lack of clean fuel (LPG, CNG, LNG, biomass, etc.) usage in the industries



Lack of awareness about advanced air pollution control devices and technologies



Challenges involved in the conversion of conventional brick kilns to zigzag and geo-locating all the existing brick kilns



Lack of awareness about the corporate social responsibility (CSR) benefits available

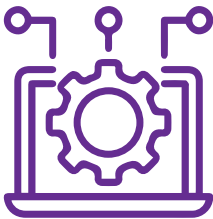
Interventions



Promoting cleaner fuel for industries



Environmental carrying capacity of an area needs to be studied before setting up industries



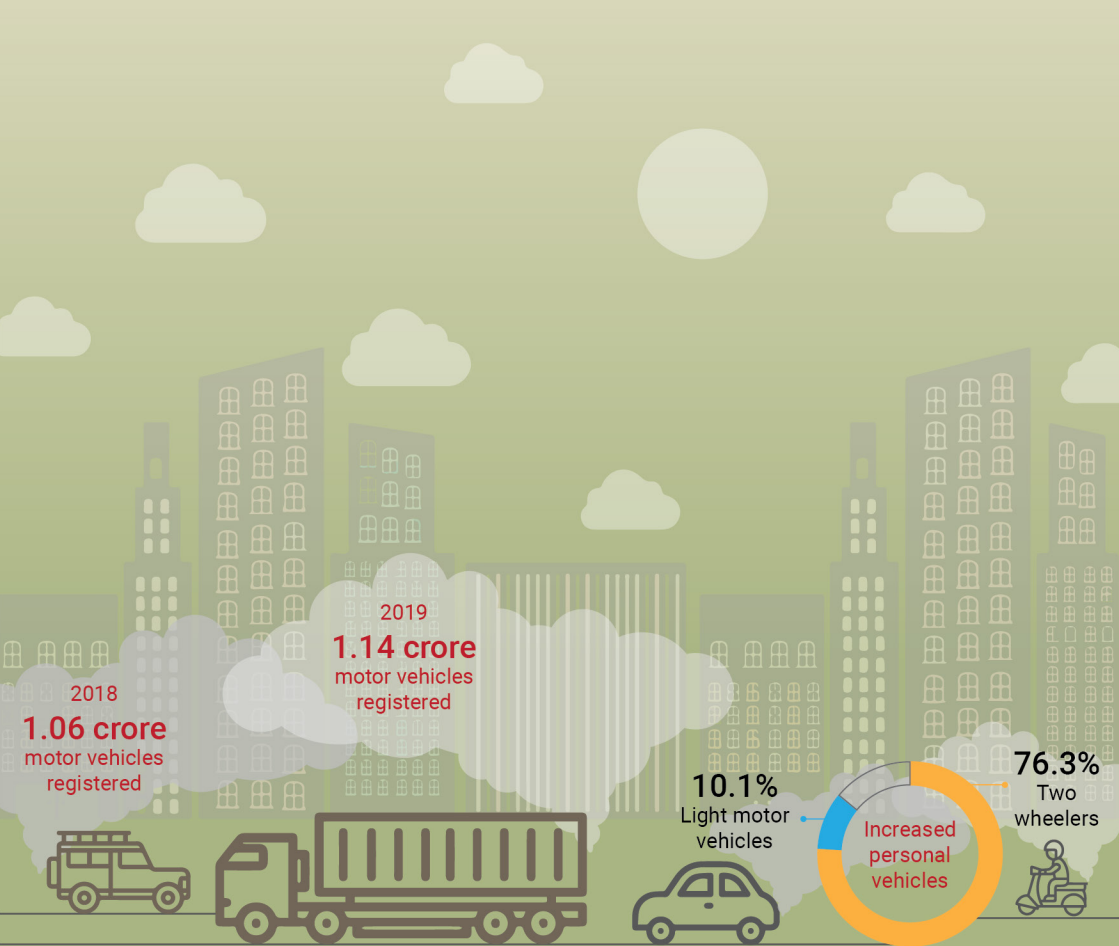
Developing a centralised platform for industrial Continuous Emission Monitoring System (CEMS) data for research analysis and modelling



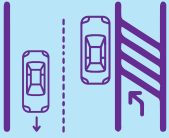
Using low-cost sensors to monitor particulate and gaseous pollutants in rural industrial areas

Transportation

As of March 2019, Punjab recorded around 1.14 crore registered motor vehicles compared to the 1.06 crore in 2018. This increase in vehicular density is because of the increased share of personal vehicles. Two-wheelers accounted for 76.3% of the total volume of motor vehicles, followed by light motor vehicles (10.1%). This raises concerns on the issues of air pollution, congestion, parking, and so forth. Hence, it is imperative to control vehicular growth and shift from personalised to public transport modes to ensure sustainable growth. Various efforts have been initiated in recent years to reduce vehicular source contribution, but a significant reduction in vehicular emissions is not yet visible.



Challenges



Unregulated heavy vehicular movement from neighbouring states



Poor public transport system and lack of end-to-end connectivity



Lack of good road infrastructure for the smooth flow of traffic



Unavailability of sufficient electric vehicle (EV) charging stations

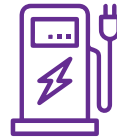
Interventions



Employing quick response (QR) codes in vehicles for detecting pollution under control certificates



Linking pollution control testing centres with a central server



EV charging infrastructure development



Monitoring of heavy-duty vehicles at toll gates



Promoting clean fuel for public transport



Developing end-to-end connectivity and public transport access in rural areas



Increasing EV buses and autos

Way forward

Punjab's air pollution challenges are not a new development. The state government is working towards interventions needed to improve air quality levels. Better coordination and collaboration among inter and intra district departments within the state are vital in implementing strategies. Empowering farmers by building their crop residue management capacity is another crucial aspect. Creating awareness about new technologies, government incentives, and the adverse health impacts of air pollution will go a long way in reducing stubble burning. Transportation and industrial emissions should also be kept in check to achieve a holistic improvement in air quality in the state. CSTEP aims to provide efficient strategies to Punjab for managing these polluting sectors in the long term.







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