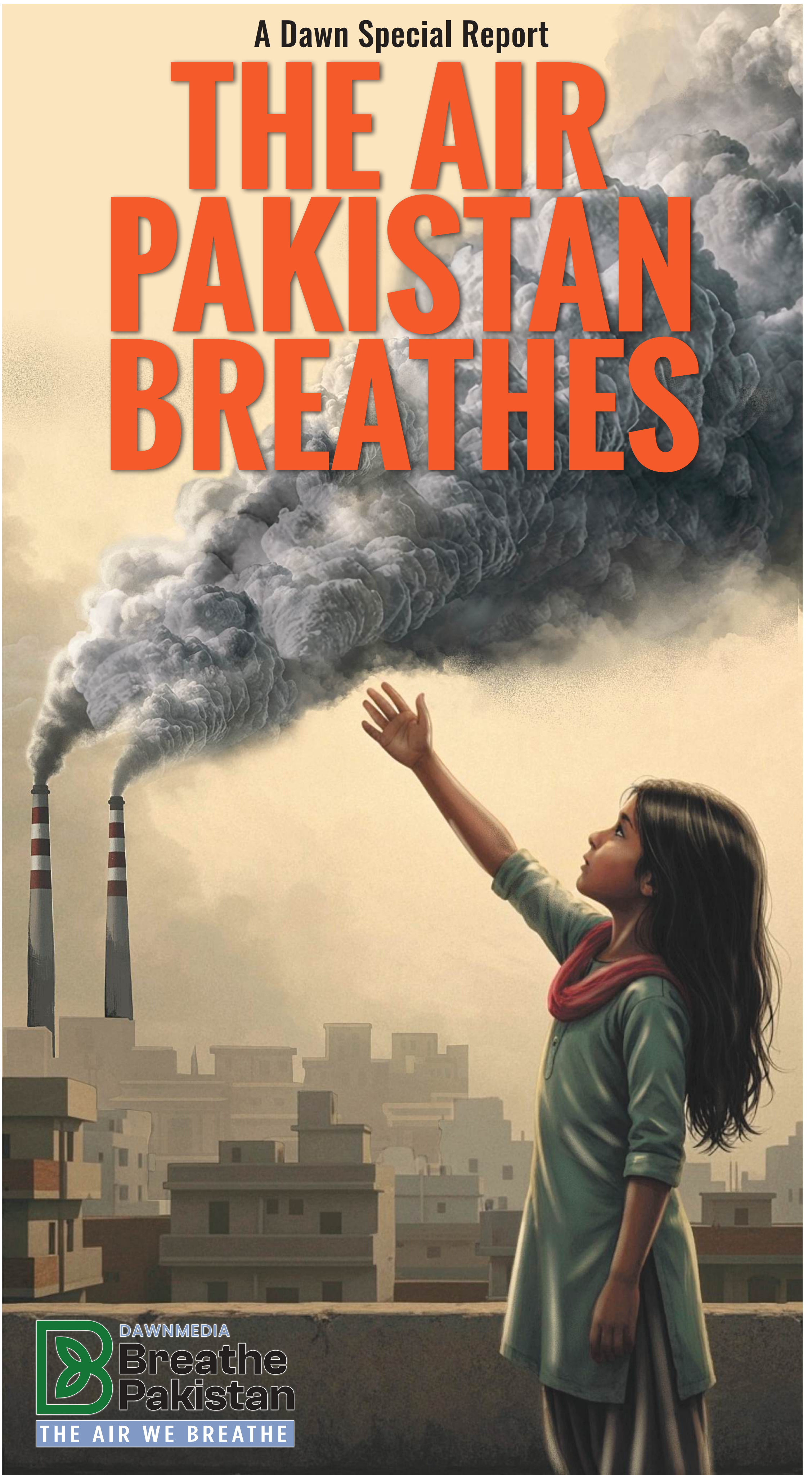


A Dawn Special Report

THE AIR PAKISTAN BREATHES



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BEYOND THE CONVENTIONAL PARADIGMS, AN INTEGRATED APPROACH IS NEEDED TO FIGHT THE MENACE OF AIR POLLUTION WHILE TRYING TO TAKE PAKISTAN AHEAD OF THE REST OF THE WORLD ON MANY COUNTS.

CRISIS VS OPPORTUNITY

By Ali Tauqeer Sheikh

PAKISTAN burns \$130 million every single day on the health and economic consequences of breathing poisoned air. This \$47.8 billion annual toll represents 5.88 per cent of GDP lost to healthcare costs, productivity losses, and 22,000 premature deaths. Over 11 million children under five are regularly exposed to hazardous air quality, with 1.8 million people in Punjab alone suffering health consequences during smog episodes. This crisis stems from 25 years of policy drift.

While Pakistan drafted the National Environmental Policy (NEP) in 2005 and Climate Change Policy in 2012, it lacked clarity of purpose and implementation resolve. During these lost decades, all major Asian economies invested systematically in public transportation, clean technologies and inclusive pro-poor policies, leaving Pakistan dangerously behind.

Current approaches remain trapped in outdated administrative and punitive measures instead of systematic, integrated solutions. This reactive approach has proven ineffective against a crisis requiring comprehensive transformation. However, Pakistan can transform this economic burden into economic opportunity by monetising carbon reductions through international markets, potentially generating revenue while cleaning its air.

The solution lies in systematic implementation of four concurrent tracks: carbon monetisation, transportation transformation, sectoral modernisation, and regional cooperation. There are no quick fixes. Coherent, multisectoral implementation of these four tracks can hopefully set Pakistan on the right direction by 2030. Success requires treating this as an economic transformation opportunity rather than merely an environmental problem, leveraging international carbon markets while addressing the transboundary nature of air pollution through 'smog diplomacy' with regional powers.

The choice is clear: continue with failed administrative approaches and accept escalating health and economic costs, or embrace systematic transformation that can deliver cleaner air, economic growth, jobs, and regional leadership by 2030.

A CRISIS OF NATIONAL SCALE

Air pollution has emerged as Pakistan's most pressing multifaceted challenge, transcending sectoral boundaries and posing unprecedented threats to public health, economic stability, and environmental sustainability. The concentration of fine particulate matter (PM2.5) frequently soars to levels far exceeding WHO guidelines, contributing to a substantial burden of respiratory and cardiovascular diseases across the Indo-Gangetic Plain that affect over 900 million people regionally.

The 2024 smog crisis exemplified these impacts when pollution surges overwhelmed Pakistan's healthcare system, with over 30,000 patients seeking treatment for respiratory ailments. Educational disruption affected 16 million children as schools and government offices were shut down, while parks, offices and markets closed across 18 districts. The World Bank estimates that one unit of PM2.5 causes \$18.9 per capita in GDP wastage, making Pakistan's economy "very air pollution intensive". This pervasive environmental degradation is not static, but dynamic, exacerbated by climate variability and seasonal smog episodes. The crisis demands a series of actions to prevent escalating health and economic catastrophe.

THE GENESIS

Pakistan's air pollution crisis originated from incoherent policies implemented in the early 2000s, particularly the automobile loan liberalisation by a government that ironically also approved the NEP 2005, emphasising ambient air quality standards and vehicular emission controls.

Vehicle numbers surged from two million in 1999 to over 10 million by 2006, reaching 25 million by 2024, driving vehicular emissions to nearly half of Pakistan's particulate and gaseous pollution. The NEP 2005's medium-term implementation framework (2005-10) was never implemented seriously, while rapid vehicle expansion directly conflicted with environmental safeguards. All political governments from 2008 to 2024 continued with the same short-term approach.

During Pakistan's period of policy drift, regional neighbours recognised air quality challenges and invested systematically in comprehensive metro systems, bus rapid transit (BRT), and emission standards. When environment became a provincial subject through the 18th Amendment in 2010, air quality management fell through institutional cracks. The National Climate Change Policy (NCCP) addressed air pollution as a climate challenge, but it was not until 2023 that Pakistan developed its National Clean Air Policy (NCAP). This institutional adrift cost Pakistan 25 years of potential progress, while the crisis deepened and neighbours advanced.

THE CURRENT STATE

Pakistan's air pollution stems from four primary interconnected sources: transportation and fuel quality, accounting for 45pc of year-round pollution through low-quality fuel and inadequate emission enforcement; industrial and energy production, contributing 40pc via coal-fired power plants and outdated processes; agricultural burning, contributing 10-20pc during post-monsoon seasons; and seasonal and structural factors, including winter inversions, deforestation, waste burning, and outdated brick kilns, compounding these sources across the regional airshed.

The economic burden includes healthcare expenditures, productivity losses, agricultural yield reductions, and premature mortality. The health crisis affects 11 million children under five in Punjab's worst-hit areas, demonstrating the urgent need for systematic transformation beyond administrative fixes.

BEYOND ADMINISTRATIVE MEASURES

Current policy responses remain trapped in reactive, command-and-control approaches with limited effectiveness and growing international implications. The NCAP 2023 targets 38pc PM2.5 reduction by



2030, but remains constrained by relaxed standards, insufficient monitoring, and weak legal frameworks that increasingly conflict with international trade requirements. Under the European Union's Carbon Border Adjustment Mechanism (CBAM), these limitations pose trade risks as global markets demand credible environmental compliance, requiring Pakistan to strengthen clean air measures and align with stricter standards.

There are no shortcuts to decades of negligence. Success requires implementation of four concurrent tracks, pursued simultaneously through multisectoral coordination. Only systematic implementation can set Pakistan on the right direction by 2030.

Track 1 involves monetising emissions through international carbon markets. The maturation of international carbon markets under the Paris Agreement presents Pakistan's most transformative opportunity of reframing emissions from liability to tradable asset. Recent climate negotiations in Baku formally recognised voluntary cooperation mechanisms and regulated international carbon markets, enabling countries to convert reduced emissions into tradable credits.

Pakistan has initiated this journey through the Delta Blue Carbon Project (2017) and approval of Policy Guidelines for Trading in Carbon Markets (2024). Thailand's Bangkok E-Bus Programme demonstrates this financing model through Energy Absolute Public Company Limited's partnership with Swiss entities. The project replaced thousands of internal combustion buses with electric vehicles through verified carbon credit sales to Switzerland's KliK Foundation at over \$30 per credit. South Pole verified avoided emissions sold as Internationally Transferred Mitigation Outcomes, while UNDP's Carbon Payment for Development Programme enhanced credibility, targeting 500,000 tonnes of emission reductions by 2030.

Pakistan can replicate this model leveraging the Bank of Punjab's joint venture agreements with Chinese manufacturers. Promising partners include

such players as BYD, CATL, Geely, JAC Motors and Changan Automobile. These partnerships, combined with carbon credit financing under CPEC 2.0 can make Pakistan's transition entirely self-funding, while creating domestic manufacturing ecosystems generating employment and export potential.

For Pakistan's fleet of 25 million vehicle producing nearly half of national emissions, systematic electrification could generate billions in carbon revenues, creating self-sustaining financial models transforming pollution burdens into economic opportunities. Implementation requires establishing dedicated carbon market authority, quantifying emission reduction potential across sectors, and developing verified carbon credit pipelines for large-scale projects.

Track 2 involves comprehensive transportation transformation. Urban air pollution fundamentally reflects transportation systems dominated by individual vehicles. Sustainable solutions require dual strategies: integrated mass transit development and large-scale vehicle electrification, moving beyond the administrative approach of temporary vehicle bans.

Current Pakistani mass transit projects operate in isolation when there should be a seamless network of buses, metro lines and feeder services. The transition's scale necessitates public-private partnerships.

Likewise, Pakistan's electric vehicle policy needs to go beyond setting symbolic targets. Pakistan should pursue state-backed acquisition of complete EV production lines through CPEC 2.0, providing investment certainty while securing technology transfer and local assembly capabilities. Large-scale EV rollout promises cascading benefits, including significantly reduced fuel import bills, creation of high-skilled manufacturing jobs, and profound public health improvements. The Bank of Punjab's financing agreements demonstrate financial sector readiness to support this transition.

Success requires national vehicle retirement age standards, targeting highly polluting older vehicles, enforcing fuel quality standards reducing sulphur

content, and introducing robust and mandatory vehicle fitness testing.

Track 3 involves sectoral modernisation of agriculture and industry. Agricultural crop residue burning and outdated industrial processes require systematic modernisation rather than punitive approaches. The Punjab Agriculture Department launched subsidised 'happy seeder' technology in 2020, enabling direct wheat sowing into unburnt rice stubble, complemented by satellite-based monitoring for real-time burning detection. Research has shown that farmers using this technology can generate up to 20pc higher profits compared to those who burn stubble, while reducing greenhouse gas (GHG) emissions by 78pc per hectare.

Scaling-up requires comprehensive farmer support, expanded subsidised residue management machinery, farming incentives, and soil health education campaigns. Converting crop residue to bioenergy could meet 14pc of Pakistan's energy needs while creating rural employment and additional income streams for farmers. Establishing collection and processing networks would generate an estimated 100,000 agricultural sector jobs while reducing burning by 60pc by 2030.

In the industrial sector, many plants continue using highly polluting fuels and processes. Solutions require mandatory transition to clean production technologies through phased equipment mandates combined with economic incentives, like tax credits and subsidised loans, for clean technology investments. Technology transfer partnerships with countries maintaining advanced environmental standards can accelerate this transition while building domestic technical capacity. Industrial modernisation ensures Pakistani exports meet international environmental standards, protecting market access worth billions in textile, cement and steel exports, while reducing emissions by 40pc by 2030.

SMOG DIPLOMACY

Track 4 involves regional cooperation and 'smog diplomacy'. Research published in leading scientific journals has demonstrated that air pollution in South Asia operates as an interconnected regional system. As such, domestic policies alone cannot address pollution sources that are fundamentally transboundary in nature, requiring coordinated regional approaches that match the scale of atmospheric processes.

Under the Institutional Framework Development, the Ministry of Foreign Affairs has been tasked with diplomatic engagement to address cross-border pollution impacts with India through 'smog diplomacy' by building on the 1998 Malé Declaration framework. This requires establishing a South Asian Air Quality Council to coordinate policies, share monitoring data, and manage joint funding mechanisms.

Punjab's smog war room provides a model for crisis management protocols that can extend to bilateral cooperation through sister-province agreements between Pakistani and Indian Punjab. Joint technical working groups would coordinate crop burning alternatives, industrial emission standards, and emergency response during severe pollution episodes. Regular bilateral summits between provincial governments would address shared challenges independent of broader political tensions. Regional

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When Punjab's children breathe clean air by 2030, when Pakistani EVs get exported to global markets, and when carbon credits fund the nation's green transition, the world will study Pakistan's blueprint. This is not an environmental policy. This, instead, is an economic strategy disguised as climate action. The next five years will determine whether or not Pakistan will emerge as a new player in South Asia's clean air landscape.

INCENTIVISING DOMESTIC INDUSTRIES TO FINANCE A PUBLIC GOOD THAT IS NOT EXPECTED TO DIRECTLY ACCRUE BALANCE SHEET BENEFITS IS TRICKY. HOWEVER, IT IS NOT REALLY IMPOSSIBLE BY ANY MEANS.

FINANCING CLEAN AIR

By Fatima S. Attarwala

AWARENESS, action, the required funding for the said action, implementation, and, finally, the results of the said action — these are all very different things. A case in point is the air pollution in Pakistan. The air we breathe has been foul for decades. Among the earliest measurements of air pollution in Pakistan was a study conducted in Lahore in 1978, cited in the *International Journal of Advances in Sustainable Development*. The metric used was Suspended Particulate Matter (SPM), a broader measure that predates today's more precise focus on particulate matter. The study recorded an average SPM concentration of 332µg/m³ in Lahore's commercial core — an extremely high level of particle pollution by any standard. And, yet, it is only in recent years that the idea of combatting the noxious air we all breathe has come into focus. For many of us, growing up, the extent of our knowledge was limited to 'plant more trees'.

So, what exactly is wrong with the air we breathe? Before financing questions can be addressed, the pollutants themselves must be understood. As energy expert Ammar Habib Khan explains, it comes down to particles and gases — carbon, nitrogen oxides, or a toxic mix of both — released largely from two sources: industry and mobility. On the mobility side, poor quality fuel combines with aging, inefficient engines that churn out more smoke than power. Tackling this is squarely a regulatory issue. "Private capital will always chase the lowest-cost solution even if that means more pollution," he points out. Industrial emissions are no different. Cleaner, lower-emission machinery can certainly be financed, but unless the state enforces environmental laws, there is little incentive for industries to switch.

Globally, too, outdoor air pollution has lagged as a priority. Climate change has been the popular currency for some time now, but outdoor air pollution remains massively underfunded compared to other development areas. Between 2018 and 2022, it received only one per cent (1pc) of international development funding, according to the Clean Air Fund. This underfunding persists despite air pollution being the largest environmental threat to public health worldwide, with severe health, climate and economic impacts.

In Pakistan, the problem may have continued to go unnoticed had Lahore's smog not made an invisible threat visible. That visibility is part of what has spurred action today. In 2025, the World Bank extended a \$300 million loan for Punjab's Clean Air Programme, supporting the province's Smog Mitigation Action Plan to strengthen air quality management and improve public health.

But the scale of the challenge is enormous. Environmental expert Dr Kulsum Ahmed estimates that 128,000 lives are lost every year in Pakistan due to poor air quality, shaving 4.3 years off the average life expectancy. Air pollution, she stresses, does not discriminate between rich and poor: a recent study shows that the precautions taken by the rich, such as household air purifiers, have not saved them from catching airborne diseases. The very large number of hospitalised cases in Karachi testify to this.

Despite the magnitude of the problem, private finance has barely entered the picture. In 2021, only 5pc of Pakistan's climate finance came



from the private sector — far below the regional and global averages of around 49pc, according to the UN's 2024 Climate Financing and Policy Recommendations.

This gap reflects not only the neglect of air pollution in global climate finance, but also the specific risks faced by investors in Pakistan: policy uncertainty, shifting subsidies and pricing mechanisms, and high foreign exchange risk given the mismatch between hard-currency investments and local-currency revenues. There is also a lack of education, data and investable use cases to give confidence to potential investors.

At the core lies a deeper paradox: clean air is a public good. There is little incentive for the private sector to finance solutions when benefits are dispersed and non-excludable. Khan argues that private capital can opt for targeted interventions in equipment to minimise pollution footprint, but without stricter fuel standards and tighter controls, technology shifts alone will not suffice. In other words, regulation is the

missing piece — a theme that recurs throughout expert opinions.

This regulatory gap is confirmed by the Pakistan Business Council (PBC). For most companies, air quality management begins and ends with compliance, argues one of its reports. The lack of senior management involvement makes it clear that businesses still do not see dirty air as a financial risk. While onsite monitoring is carried out, there is little interest in how operations affect the wider airshed that communities actually breathe.

Nazish Shekha, Head of Initiative, Centre of Excellence in Responsible Business at PBC, highlights the hotspots: "Sometimes, it is as specific as a single roundabout or an intersection with too many traffic signals." During rush hour, when cars idle longer, air quality dips sharply. Construction adds another layer.

But beyond identifying causes, the bigger challenge remains structural: why should companies spend money fixing something that does not deliver direct shareholder returns? Yet, the impacts are already creeping into balance sheets — damaged facilities, eroded employee health, disrupted travel, etc. Smog in Punjab has even grounded flights and shut down motorways, delaying both goods and staff.

As urban residents in Pakistan become more aware of air quality through the availability of free data from monitoring platforms and weather updates, the private sector can potentially begin to be held liable for poor air quality onsite and in adjacent neighbourhoods. As a precursor to future financial risks, companies can begin following international guidelines for air quality and advocate for improved management in their supply chains, according to the PBC study.

Furthermore, investors have now become focused on certain aspects of Environmental-Social-Governance (ESG) approach with an increased emphasis on occupational health — not only workplace injuries, but the overall health of employees, both emotional and physical. A World Bank 2021 publication estimates that the global cost of health damages associated with exposure to air pollution is a whopping \$8.1 trillion.

A somewhat dated report from the Organisation for Economic Cooperation and Development (OECD) estimates that by 2060, the annual number of lost working days is projected to reach 3.7 billion globally. The 2016 OECD report had estimated the number of lost working days annually was around 1.2bn for the world at the time. In the long run, companies that voluntarily implement measures to improve air quality will benefit from a healthier workforce, according to the PBC report.

Even real estate offers a clue. From a valuation perspective, investment returns are higher on properties surrounded by parks and cleaner air. Subconsciously or not, markets are already signalling that cleaner air carries value, notes the PBC report. The question, then, is how to align public responsibility with private incentives. One way could be for the government to enforce strict regulations, but also reward early compliance. Tax incentives, for instance, could nudge companies to meet air quality benchmarks ahead of schedule — turning regulation into a financing opportunity, rather than just a compliance burden.

The economics make the case clear. A 2011 US Environmental Protection Agency report estimated that every \$1 spent on improving air quality yields \$30 in monetised benefits, mostly through health improvements. For Pakistan, where the pollution levels are much higher,

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Bank Alfalah
The Way Forward



AWARDEE
OF EXCELLENCE
IN SUSTAINABLE
DEVELOPMENT

Bank Alfalah's Contribution to a Sustainable Way Forward

Bank Alfalah is at the forefront in reflecting its purpose that extends beyond financial success

Under the visionary leadership of His Excellency **Sheikh Mubayyir Mubarak Al Muhayyar**, Chairman of Bank Alfalah and the Board of Directors, who graciously approved the donation of **\$10 million** in response to the devastating floods that hit Pakistan in 2022, the Bank embarked on a **two-pronged strategy** to redevelop communities in a **sustainable, equitable, and financially inclusive** manner. This initiative addressed the immediate needs of the affected communities and is now providing a comprehensive framework for long-term rehabilitation.

To date, Bank Alfalah has disbursed a total of **PKR-2.1 billion** through this program, positioning itself as one of the largest corporate contributors to fostering a sustainable future for flood-impacted communities.

Over the last two years, the Bank has joined forces with **25 esteemed partners**, receiving the Bank's disbursement to address critical sectors such as health and emergency care, affordable housing, accessible education, and sustainable livelihoods.



Atif Bajwa, President and CEO of Bank Alfalah, commented, "With the gracious support of the Chairman and the Board of Directors, we worked with the most reliable and trusted names in Pakistan to extend support to the most vulnerable communities impacted by floods since 2022. We intensified our joint efforts and reached communities for relief and rebuilding phase with a medium to long-term plan to support them for a sustainable way forward. In a disaster of unprecedented proportions, we must always come together to provide continuous support to those impacted through our collective contribution."

Phase-I Rescue and Relief

Since 2022, the Bank has partnered with reliable and trusted non-governmental organisations (NGOs) across Pakistan. These partnerships facilitated the rescue of and assistance to flood-impacted communities in hard-hit areas.



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42,932 Ration Bags and 9.6 Million Meals



436 Medical Camps



30,000 Winter Kits



7,000 Water Filters



2,077+ Tents

PKR **345 Million**

Phase I & II Collectively Impacted Over **1,113,000** People

Phase-II Rehabilitation and Rebuilding

The Bank embarked on phase-2 in the second half of 2023 and followed it through in 2024 focusing on rehabilitation and rebuilding lives. This phase encompassed several key areas: sustainable housing, healthcare, education, and livelihood support.

PKR **633.5 Million**



Healthcare

PKR **376.8 Million**



Sustainable Housing and Reviving Livelihood

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PKR **250 Million**



Interest Free Loan

PKR **250 Million**



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TIME IS SURELY UP FOR STUBBLE BURNING AS A ROUTING AGRICULTURAL PRACTICE IN PAKISTAN. HOWEVER, TOP-DOWN SOLUTIONS ARE BOUND TO FAIL JUST AS THEY HAVE FAILED EVERY SINGLE TIME WE HAVE TRIED.

TIME FOR REORIENTATION

By Dr Imran Saqib Khalid

AIR pollution in Pakistan represents a multifaceted environmental and public policy challenge, stemming from a variety of sources that collectively degrade air quality and public health across the nation. Key contributors include vehicular emissions from an expanding fleet of ill-maintained vehicles, industrial discharges from sectors like textiles and cement, dust from construction activities and unpaved roads, emissions from brick kilns that rely on low-quality fuel, and seasonal practices such as stubble burning. These factors interact with meteorological conditions, such as temperature inversions in winter, to trap the pollutants and create dense smog layers. Among these, stubble burning emerges as a particularly hazardous issue during the autumn months, when farmers in Punjab incinerate crop residue post-harvest, releasing vast quantities of particulate matter and greenhouse gas (GHG) emissions that exacerbate the already bad pollution levels. Stubble burning is deeply intertwined with the agrarian evolution of South Asia, particularly the rice-wheat cropping system that dominates Punjab. This intensive rotation with rice sown in the monsoon (June-October), followed immediately by wheat in the dry winter (November-April) has its genesis in the Green Revolution of the 1960s. High-yielding varieties promised food security, but they came with a hidden cost: shorter crop durations and mechanised harvesting that left behind tall, dense stubble residue difficult to manage manually. In Pakistan, where Punjab's 80 per cent mechanised rice harvest mirrors India's, farmers face a mere 15-20-day window to clear the fields for wheat sowing, lest yields plummet owing to delayed planting. Similarly, in India's northwestern states, the same Green Revolution dynamics have led to widespread mechanisation, amplifying the regional pollution footprint.

To the farmers, burning offers a swift solution. It sterilises soil against pests, releases short-term nutrients like phosphorus and potassium, and cost-wise it is far cheaper than other methods that add up to 30pc to labour expenses. A 2019 emission inventory spanning 2000-14 reveals how this practice scaled with agricultural intensification: annual rice residue production hit 8.5 million tonnes, with 3.6-5 million tonnes burned between October and January to expedite wheat planting. In India, parallel trends show even larger scales, with over 23 million tonnes of rice stubble burned annually in Punjab and Haryana alone, contributing significantly to transboundary emissions that drift into Pakistan's airspace during prevailing westerly winds in autumn.

Colonial-era land policies favoured monocropping, and post-independence subsidies for water and fertilisers further cemented this trend. In south Punjab villages, a 2019 study found that 85pc of the respondents viewed burning as a cultural norm, inherited from generations who saw it as essential for survival amid labour shortages and rising input costs. Yet, as climate variability shortens monsoons and intensifies winters, what was once adaptive has become maladaptive. The Food and Agriculture Organisation (FAO) attributes 20pc of Pakistan's air pollutants to this source, a figure that underscores how historical expediency feeds an ongoing crisis. Comparable figures in India attribute up to 30pc of Delhi's winter PM2.5 to stubble fires from neighbouring states, highlighting the shared historical roots and cross-border ramifications of this practice.

The smoke from stubble fires does not dissipate; it infiltrates lungs, soils and skies, weaving a web of health hazards. An analysis estimates that incinerating 63 million tonnes of South Asian stubble annually results in 1.2 million tonnes of particulate matter, 0.6 million tonnes of methane, and 91 million tonnes of carbon dioxide (CO2)-equivalents that spike PM2.5 levels by 40-60pc during harvest peaks. In Pakistan, this manifests as winter smog, where thermal inversions trap pollutants, turning Air Quality Index (AQI) in urban centres, such as Lahore and Multan, to hazardous levels and beyond. Across the border, Delhi experiences analogous spikes during the same period, as satellite data reveals plumes from Indian Punjab



merging with those from Pakistani Punjab to form a regional haze.

The cost to human health is staggering. The Air Quality Life Index (AQLI) reports that crop burning shaves 4.3 years off average life expectancy in polluted hotspots, with over 20,000 premature adult deaths and 160,000 disability-adjusted life years lost annually in Pakistan alone. Infants and children bear the brunt, as is evident from a study that appeared in the journal Nature. It highlights how across India and Pakistan in-utero PM2.5 exposure from stubble burning results in 24-26 additional infant deaths and 30-36 child deaths per 1,000 births. Respiratory ailments surge, while cardiovascular and neurological diseases affect thousands more. In Lahore, where 14 million residents inhale this hazardous air, hospital admissions for pollution-related illnesses triple during the smog season, costing the exchequer significant sums in lost productivity. In Delhi, similar surges overwhelm healthcare systems, with studies estimating 10,000-30,000 annual deaths attributable to stubble-related pollution.

Environmentally, the fallout erodes the very foundation of our breadbasket. Burning volatilises nitrogen (75pc loss), phosphorus and sulphur, slashing soil fertility by 25-30pc and microbial diversity, which hampers water retention and increases erosion. Black carbon, the second-largest warming agent after CO2, accelerates glacial melt in the Himalayas, threatening downstream water and food security for 1.9 billion South Asians. Economically, air pollution devours 6.5pc of GDP, up to \$12 billion yearly, through diseases, absenteeism and dips in crop yield owing to acid rain and ozone formation.

A bureaucrat incentive experiment, discussed in the aforementioned Nature study, serves as a caution against relying solely on command-and-control mechanisms to address the issue. Analysing 18 million grid observations (2012-22) across India and Pakistan, it found that when winds blow smoke into a particular district, officials slash fires by 10-13pc via targeted penalties. In Lahore, a similar order reduced fires by 9pc in monitored blocks, as per satellite data. Yet,

spillover effects persist. The study reveals that the incidence of stubble burning rose by 15pc when winds favoured neighbours, highlighting enforcement's jurisdictional blind spots. This transboundary dynamic is reflected in India-Pakistan interactions as well, where Indian fires increase when winds direct smoke towards Pakistan.

To effectively address the persistent challenge of stubble burning in South Asia, policymakers should prioritise a holistic environmental policy framework. Such an approach will integrate key facets of environmental communication, emphasising stakeholder engagement over reliance on traditional command-and-control measures, like bans and fines, which have not been sustainable. A communication-centred approach could foster voluntary adoption by reframing the issue from a mere regulatory burden to a shared health and economic imperative. Use of vivid, localised narratives in campaigns that depict the direct impacts of smog on family health can go a long way in facilitating this. This framing could build empathy and urgency, drawing on psychological tools like future-self visualisation exercises where farmers imagine the degraded land inheritance for their children, ultimately yielding higher compliance rates than punitive measures alone. A compelling global parallel is Indonesia's Pertamina Corporate Social Responsibility programme for peatland fires, where corporate communication reframed fire-prone practices as community threats through targeted narratives on health and economic losses.

Building on this, policy recommendations should include audience segmentation and targeting to tailor messages for diverse groups, ensuring relevance and overcoming the 'one-size-fits-all' pitfalls of command-and-control strategies. A more holistic policy would segment communications, delivering Punjabi-language podcasts on bio-decomposers to frontline farmers, workshops for community unions, and data-driven briefs for policymakers. Besides, participatory dialogue and co-design should be embedded in policy

to co-create solutions with stakeholders, contrasting sharply with the top-down enforcement of measures.

Transboundary policy options are essential given the cross-border flow of pollution. Establishing a joint Pakistan-India task force under frameworks like the South Asian Association for Regional Cooperation (Saarc) could harmonise air quality standards, share real-time satellite monitoring data on fire incidents, and co-develop incentives for alternatives to burning, such as cross-border subsidies for specific machinery. Bilateral agreements could include mutual enforcement protocols through 'smog diplomacy' initiatives. Such regional approaches, supported by international bodies, would amplify national efforts and mitigate the blame-game that hinders progress. Southeast Asia's haze mitigation efforts offer direct lessons here. In particular, the Asean Agreement on Transboundary Haze Pollution (2002, revised 2014), has curbed recurrent peatland fires in Indonesia and Malaysia via regional monitoring networks, early warning systems and joint suppression teams. The result has been reduced haze episodes by up to 70pc in compliant years, and fostering trust through annual ministerial meetings and public awareness drives that depoliticise the issue.

Finally, robust evaluation and feedback loops should underpin these policies to ensure iterative improvement. By integrating satellite verification in farmer apps, annual reports on health benefits, like reduced child mortality, and goal-setting for zero-burn villages, policies can effectively refine long-term strategies. Addressing complex environmental and public policy issues, such as air pollution, through command and control or siloed approaches has not worked. Hence, what is required is a sea change in our thinking that places collaboration before conflict and collective human wellbeing before shortsighted political goals.

The writer works at the intersection of climate, ecology and society, and can be reached at imranskhalid@gmail.com

LIFE EXPECTANCY IN PUNJAB HAS GONE DOWN IN THE LAST FEW YEARS. WHAT SHOULD WE EXPECT NEXT?

SMOG IS THE FIFTH SEASON

By Irfan Aslam

IT is not rare anymore for Lahore to be the most polluted city in the world, with the Air Quality Index (AQI) crossing all known hazard zones. Just days ago, it was 180 when it should have been less than 100 to be acceptable. Alarminglly, it was September, which is not even considered part of the dreaded smog season when AQI values soar past the 1,000 mark; twice of the upper cap of the AQI hazardous range.

In the IQAir country ranking for 2024, Pakistan was third on the list of countries having the worst air quality, following only Chad and Bangladesh. In 2024, AQI in several cities of Punjab crossed the hazardous level. Other than Lahore, these cities were Multan, Faisalabad, Gujranwala, Sialkot and Rawalpindi/Islamabad. In November last year, the AQI crossed 1,000 for the first time since the monitoring of smog started in Lahore. In the same month it touched 1,173. According to the Pakistan Air Quality Initiative (PAQI), the pollution of PM2.5 — fine particulate matter in the air that causes the most damage to health — pollution increased by 25pc in Lahore in 2024 compared to 2023. The average pollution level also went up by 23pc compared to last year. These are serious numbers demanding serious actions.

Activist Dr Ajaz Anwar, spearheading the Lahore Conservation Society, says there was a time when most people would walk in the city and ride bicycles. “One cannot even think of these activities in contemporary Lahore because the city has been expanded in such a way that there is no space left for either pedestrians or cyclists.” Lack of public transport, he says, has led to an influx of motorcycles and rickshaws that emit smoke and pollute the air.

Zainab Naeem, an environmental scientist working with the Sustainable Development Policy Institute (SDPI), also believes that other than the natural phenomena involved, human activities — vehicular emissions, stubble burning, brick kilns and industrial emissions — are behind the spike in air pollution.

Worryingly, the expert expects to have a more severe spell of smog this winter due to heavy floods across Punjab in both Pakistan and India. “There were long spells of rains and heavy flooding in the riverine areas of Ravi, Sutlej and Chenab across the border. The floods brought silt and mud with them and left it behind on the planes when the floodwater receded. The moisture in the air holds dust particles rising from the silt left behind by floodwater for a longer time and this can cause more pollution, hence more smog,” she warns.

However, environmental lawyer Ahmed Rafay Alam

sees a silver lining, saying that many areas in the rice belt of Pakistan had the crop washed away completely by the floods, which means there would be less crop residue burning this season. The eastern wind that takes smog and air pollution away from Pakistan may come in October this year instead of November when it normally starts blowing. “The early wind and less crop burning may lead to less intense smog, and, if it happens, the change would occur only owing to the natural phenomenon,” he stresses.

Talking about the administrative issues involved, Rafay points out that after the 18th Amendment, the environment became a provincial subject, and the provinces made their own laws. The problem, he points out, is that they just copied the earlier federal law without doing any extensive work on it. Punjab was no different. While hearing a public interest petition in 2016, the then chief justice of the Lahore High Court asked the provincial government to make a policy on environment which the relevant department subsequently presented in the high court. A Smog Commission was formed on the order of the court, which prepared a policy document to mitigate and control smog and air quality in 2017, recalls Rafay, regretting that a political change in 2018 changed everything. He suggests the formation of new laws as the current ones were drafted 30 years ago.

The government, says Zainab, should take steps to increase buffer zones to improve air quality, and focus on building a circular economy that may utilise crop residue as raw material for other products. “Industrial emissions should be controlled, and air pollution data should be collected to make effective strategies to fight air pollution. Data should be collected from the Indian Punjab as well, using satellite technology in case the Indian government does not share it voluntarily. Cycling should be promoted, and the entry of heavy vehicles in cities should be banned except for certain days of the week,” she adds. Dr Ajaz also suggests increasing the green cover in the cities, but regrets that even though trees produce oxygen, “it is tragic that trees are being taken down in the name of development”.

While all these suggestions sound good, Rafay throws a spanner in the works by pointing out that even if Punjab starts taking all the required action to control air pollution today, it would take at least eight to 10 years to make a significant change, or bring the air back to bearable level. “And it will require massive investments at each stage.” Life expectancy in Lahore has already been reduced by eight years. Punjab needs urgent action without hoping for an early result. This is quite a conundrum.

The writer is a member of staff.

THE MENACE CAUSED BY THE SPREAD OF PLASTIC-BASED TRASH IS ACTUALLY ENORMOUS. FROM THE HIGHEST OF MOUNTAINS TO THE DEEPEST OF OCEANS, PLASTIC IS FOUND EVERYWHERE AND AFFECTS EVERYTHING.

PLASTIC IS PERFECT POISON

By Dr Ainy Zehra

On many a count, it is fair to say that we live in the ‘plastic age’. It all started when plastic first promoted as a ‘miracle’ substance that could give materials certain qualities, like flexibility, colour and water resistance. Since then, it has been used extensively in industrial applications. Its carbon footprint, however, made it a scourge because it infiltrates our bodies, contaminates our food, and pollutes our environment. According to statistics, millions of wild animals are killed annually, and one human dies from a sickness caused by plastic waste every 30 seconds. The menace caused by the spread of plastic-based trash is enormous; from the highest of mountains to the deepest of oceans, it is found everywhere and affects everything.

Normally, there are three stages to the plastic lifecycle: those that are currently in use, those that have been officially treated at the end of their lifecycle, and those that have leaked into the environment as mismanaged waste. In Pakistan, over 3.3 million tonnes of plastic waste are generated each year, 86 per cent of which gets leaked into the environment. In Punjab, a total of 15.348 million tonnes of solid waste is generated every year; plastic waste accounts for 1.22 million tonnes of the total. The open burning of plastics, in turn, adds to the complexity of Pakistan’s air pollution problem owing to greenhouse gas (GHG) emissions.

Pollution is a persistent annoyance with moral and financial consequences in addition to being an environmental threat. Severe floods brought on by heavy monsoon rains in recent years, for example, serve as a stark reminder of how vulnerable our natural systems have become. The entire ecosystem — from soil to air, and even the seasonal cycles — has become unstable in the wake of these floods.

In Pakistan, the province of Punjab is the worst affected. Punjab’s escalating pollution issue and its seasonal smog affect everyday life, forcing people indoors to protect their health. While other city in Punjab also get affected rather seriously, the case of Lahore is a phenomenon in itself. Lahore, the second-largest city of the country, with a population of about 15 million, an annual economic growth rate of 4pc, having about six million vehicles and a lot of industrial activity, is one of the most polluted cities on the planet.

Lahore’s average Air Quality Index (AQI) in winter was about 240 in 2017, more than 300 in 2020, over 450 in 2022, and well over 500 in 2024. This is as big



a crisis as one can imagine, and calls for appropriate mitigation strategies.

Some of the successful stories that provide insight into the prevalence of smog and its mitigation can help us find viable solutions. For instance, Beijing, which has experienced decades of extreme pollution, declared war on air pollution in 2013 and introduced a comprehensive framework to reduce PM2.5 density by more than 30pc through the use of scientific governance, institutional innovation, strict emission regulations, cleaner technology adoption, large investments in renewable energy, and regional cooperation. London’s Ultra Low Emission Zone

scheme, which has been in place since 2019, is another example of a revolutionary step.

On its part, the Punjab government has also implemented a number of measures with a multifaceted strategy and a strong political will to address the issue. While short-term action is necessary, the real focus has to be on long-term strategies. Short term mitigation strategies include implementing intelligent transportation system, focussing on shift to greener vehicles and their monitoring, controlling traffic congestion, temporary bans on private vehicles, carpooling and public transport incentives, and, fuel policy reforms.

Also, installing air quality monitoring systems based on artificial intelligence (AI) will surely assist data imputation, anomaly detection and AQI estimation. Controlling industrial emissions during peak pollution phases, and enforcing emission standards and regulatory policies are also critical. Switching to zigzag technology for producing cleaner bricks to replace conventional brick kilns would also help. Besides, gas-powered equipment need to be replaced with electric equipment. Finally, we should ensure environmental governance and engage the community through awareness programmes.

Long-term mitigation strategies should include the development of smart industrial units in a smart city for which urban planning and predictive analytics would be as effective as comprehensive reforestation programmes. Likewise, cleaner technologies, regenerative agriculture, and a clear behavioural shift within the communities should be our targets.

The importance of our holistic strategies extends beyond a single Sustainable Development Goal (SDG); they have a significant positive impact on several SDGs, directly contributing to SDG-3 (Good Health and Well-Being) and SDG-7 (Affordable and Clean Energy), while indirectly contributing to SDG-2 (Zero Hunger), SDG-4 (Quality Education), SDG-5 (Gender Equality), SDG-8 (Decent Work and Economic Growth), SDG-10 (Reduced Inequalities), SDG-11 (Sustainable Cities and Communities), SDG-12 (Responsible Consumption and Production), SDG-13 (Climate Action), and SDG-15 (Life on Land).

Last but not least, coordination among regional stakeholders is necessary to achieve universal healthcare improvements because tackling air pollution and its myriad challenges is not a one-off endeavour. We need to move forward with sustained efforts, and envision a world where every breath is a testament to human wellbeing.

The writer is an Islamabad-based environmental analyst.



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MAJOR CITIES ACROSS THE COUNTRY CONTINUE TO SUFFOCATE UNDER A SYSTEM THAT OFTEN TENDS TO CHOOSE NEGLECT OVER ACTION. DATA, THOUGH AVAILABLE, WOULD MEAN NOTHING IF IT SITS UNUSED.

THE URBAN CONTRIBUTION

By Maira Mumtaz

LIFE across Pakistan’s urban centres, especially Karachi, remain in a constant motion. Every morning we step outside, we suffer, without even realising, from air pollution. Garbage piles are set alight along the roads, chimneys in industrial clusters release plumes that spread far beyond factory walls, and vehicles — many, and most of them decades old — emit noxious smoke. We feel a scratchy throat after a long bus ride, and our children suffer from frequent and lengthy bouts of cough. These scenes are unremarkable in their familiarity, but, collectively, they define an urban crisis. The very air we breathe is steadily becoming toxic.

When people say ‘pollution’, they often mean a smell, a visible haze, or black smoke from some industrial or vehicular exhaust. Technically, however, much of the real harm comes from PM2.5, particles smaller than 2.5 micrometres and about 30 times thinner than a human hair. Because they are so tiny, PM2.5 particles slip past the nose and throat, reach deep into lungs and enter the bloodstream.

Karachi, being the most urban of all urban centres in Pakistan, is a valid case to understand how we are all simultaneously victims and culprits. Our practices spoil the environment, and then we get to breathe the air we breathe, and suffer the consequences. The city’s worsening air quality can be traced to a handful of familiar sources: burning waste in the open, factories running on dirty fuels without filters, decades-old vehicles and diesel generators belching exhaust, and chemical leaks from industries like dyeing and tanneries. Each on its own may seem ordinary, but together they create the toxic haze we all live in.

Anyone living in Karachi already knows why these problems persist. Burning plastic is quicker than waiting for the trash collector, assuming the collector ever comes. Running an old bus or truck is cheaper than investing in a cleaner fleet. Small factories cut corners on filters because enforcement is weak and inspections are rare. The city’s informal economy thrives in the shadows, with workshops and units operating without permits, much less environmental safeguards. And, above all, the city simply lacks the infrastructure to deal with its waste: not enough landfills, recycling plants, or collection systems. What looks like quick-fix, inexpensive ‘solutions’ actually come at an enormous cost to public health.

Karachi’s air crisis is not just an inconvenience; it is a full-blown public health emergency, silently cutting lives short and draining the city of its future. Every breath carries a dose of poison, every lung is a frontline. This is not an abstract problem buried in reports; it is a daily assault on children walking to school, workers commuting through choking traffic, and families living next to smoke-belching factories. The numbers are clear, the science is conclusive, and the human stories are impossible to ignore. Yet, the city continues to suffocate under a system that chooses neglect over action.

The truth is brutal: enforcement is weak, monitoring is tokenistic, infrastructure is broken, and political will is absent. Industries pollute with impunity, vehicles poison the roads unchecked, and garbage is burnt openly in the streets. What we are living through is not just policy failure; it is environmental injustice on a massive scale.

And, yet, the way out is not a mystery. Stronger laws, stricter



enforcement, real-time monitoring, investment in waste and transport systems, and an honest commitment to public health are not radical demands, they are the bare minimum a megacity should expect. The research exists, the civil society pressure is building, and the tools are within reach. What is missing is courage from those in power. Karachi cannot afford cosmetic fixes or half-hearted projects. Without systemic transformation, the city’s legacy will be a generation of sick, stunted, and silenced citizens. Clean air is not a privilege. It is a right. And every day that right is denied, Karachi edges closer to collapse.

Karachi’s crisis is not inevitable; it is the result of choices, neglect and silence over years. The health costs were documented over a decade ago, yet the same urban practices continue to poison the air. This is not just Karachi’s burden; it is part of a global ‘invisible pandemic’, with air pollution now the single greatest external threat to human health, stealing years from lives everywhere.

Solutions exist, but they require urgency and enforcement. Retiring old vehicles, shifting industries to cleaner fuels, banning open burning, and managing waste properly are the bare minimum the city needs. Transitioning to electric vehicles (EVs) will also help. But until the state acts, the harsh truth is that people would continue to have to fend for themselves. For anyone spending hours on the road, wearing a protective mask is now a survival gear. Karachi already has monitors scattered across the city, silently recording the poison we inhale. But raw numbers mean little unless they are tied to action.

Air quality tools exist, and companies are working to make them accessible, but they only matter if citizens choose to use them and demand accountability. This data would mean nothing if it sits unused in reports while the smoke keeps rising. There are platforms now that map real-time air quality alongside pollution sources, giving citizens and policymakers a clearer picture of where the problem originates. Without enforcement and citizen pressure, however, even the smartest dashboards risk becoming more unread reports, while the smog continues to thicken. Among other things, the state must enforce its own laws and empower communities with the knowledge and tools to demand change. Until that happens, people living any urban centre in Pakistan will keep paying the price, with their lungs, their hearts, and their futures.

The writer is part of the Climate Action Centre team, exploring intersections of climate, society and storytelling.



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URBAN FORESTS SEQUESTER CARBON, REGULATE TEMPERATURE, ABSORB POLLUTANTS, AND HELP RESTORE THE VERY SOUL OF URBAN LIFE. BESIDES, THE ECONOMIC ARGUMENT ALSO REMAINS EQUALLY STRONG.

CITIES WITHOUT GREEN LUNGS

By Masood Lohar

IN an age of rapid urbanisation, climate volatility and ecological degradation, urban forests have become vital sanctuaries — not just for biodiversity, but also for human survival. These green lungs of cities do more than provide shade and serenity. They sequester carbon, regulate temperature, absorb pollutants, and help restore the soul of urban life. The Clifton Urban Forest (CUF) in Karachi stands as a beacon of this transformation, showing how a city can reclaim life from concrete and chaos.

The CUF's achievement is more than a local triumph. It is a call to action for cities across Pakistan — from Lahore to Peshawar, and from Quetta to Multan — where liveability is declining, air quality is deteriorating, and global rankings paint a grim picture. Air pollution alone causes over thousands of premature deaths every year and drains a considerable percentage of the national GDP. Pakistan's urban population, current about 40pc, is projected to reach 59pc by 2050, piling more pressure on already strained infrastructure. In Karachi, Lahore, Faisalabad, Multan and other fast-growing cities, congestion, heatwaves, untreated industrial emissions, and unplanned sprawl have combined to make daily life harsher and shorter.

Against this bleak backdrop, an urban forest offers a powerful counter-narrative. The CUF project has turned what was once a garbage dump into a thriving ecosystem of more than 700,000 trees across 101 species. It includes a freshwater lake, mangroves and a lagoon. By sequestering an estimated five metric tonnes of carbon dioxide every day, it helps clean Karachi's toxic air. The forest also hosts social gatherings that reconnect people to nature. Birds long absent from the city have returned, alongside native honeybees and other pollinators essential for ecological balance. Over 140 bird species have been recorded here, which include flamingos, pelicans and Siberian ducks.

This model offers lessons for the entire country. Its success rests on community leadership, strong public-private partnerships, and a commitment to native species that can survive in Pakistan's arid, saline coastal conditions. Rather than a top-down government scheme, it is a civic movement. Residents, students, artists, scientists and others have a stake in its survival. This participatory approach has allowed the forest to advance multiple UN Sustainable Development Goals at once: Zero Hunger, Good Health, Sustainable Cities, Climate Action, Life Below Water, and Life on Land.

Urban forests are cost-effective, multi-functional



infrastructure. Trees filter particulate matter, lowering rates of asthma and heart diseases. Their shade cools urban heat islands, cutting energy demand. Roots soak up stormwater, reducing the risk of flash floods while replenishing groundwater. Dense foliage even muffles noise pollution and provides habitats for birds and insects, shoring up biodiversity in places once written off as ecological wastelands. Each of these benefits carries a measurable economic value — from savings in healthcare and energy costs to gains in real-estate prices and eco-tourism. In a country where nearly 70pc of the urban workforce toils in the informal economy, urban greening also creates dignified jobs in planting, maintenance and education.

The need could not be more urgent. In Lahore, winter smog regularly pushes air-quality indices into the hazardous territory. Faisalabad's industrial emissions blacken the skies and the lungs alike. Quetta faces acute water scarcity, while Peshawar struggles with climate-driven migration and informal housing. Karachi, with its rising sea level and coastal erosion, risks losing parts of its very shoreline. These crises do not unfold in isolation. They are interconnected symptoms of the same pattern: unplanned growth, neglected ecosystems, and a planning approach that treats rivers and land merely as raw material for construction.

Urban forests demonstrate that the cure

must be equally interconnected. They show how environmental restoration can double as social and cultural restoration. Public spaces that host social events and school excursion trips are not just carbon sinks; they act as living commons, strengthening what experts call the 'social infrastructure' of a city.

Scaling up requires political will as well as grassroots energy. A national urban forest strategy could guide cities to identify degraded land — canal banks in Lahore, riverfronts in Multan, old industrial plots in Faisalabad — and convert them into green corridors. Such a strategy would integrate forests into city master plans and climate-adaptation frameworks, link them to carbon markets and corporate social responsibility funding, and embed urban ecology into school curricula and public media. Transparent monitoring — tracking biodiversity, air quality and social use — would ensure these forests stay alive in more than name.

Pakistan's environmental policy has often focused on large dams and mechanical fixes. Yet, as floods, droughts and heatwaves intensify, it is clear that hard infrastructure alone cannot secure urban life. Soft, living infrastructure, comprising forests, wetlands and mangroves, is equally strategic. These natural systems cool and hydrate cities, store carbon, and provide buffers against climate shocks in ways that concrete never can.

The economic argument is equally strong. Cleaner air reduces hospital visits and lost workdays. Green neighbourhoods raise property values and attract investment. Urban forests draw visitors, birdwatchers, and school groups, adding to local incomes. They are public health measures, climate-action tools, and cultural assets rolled into one.

What began as a community experiment in Karachi now stands as a national prototype. From the mangroves of Karachi to the old riverbeds of Sukkur, from the canal-sides of Lahore to the arid outskirts of Quetta, Pakistan can seed a network of urban forests that cool its cities, heal its air, and lift its spirits.

The choice is stark. The country can persist with business as usual — choking on smog, getting baked under heat islands, and watching rivers turn to drains — or it can embrace a green renaissance. Transformation is possible when vision meets action, when people reclaim neglected land, and invite nature back into the city. What is a wasteland today, can be a living symbol of resilience and hope tomorrow.

The writer is a climate journalist and founder of the Clifton Urban Forest.



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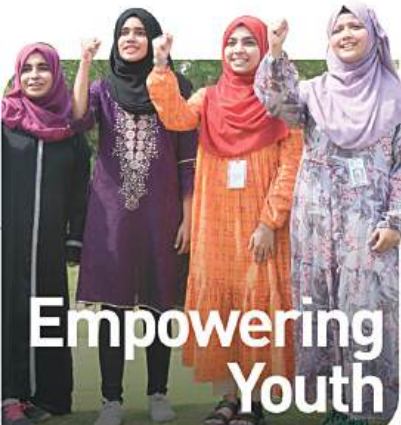
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MINISTER’S MESSAGE

THE following is a Message from Marriyum Aurangzeb, the Punjab Senior Minister:

Our mission is clear to ensure that every citizen of Punjab breathes clean, healthy air. Under the leadership of the Chief Minister of Punjab, the Clean Air Strategy is anchored on three pillars: technology and real-time data, decisive enforcement, and public participation.

With advanced monitoring systems, satellite imagery, and digital air quality dashboards, Punjab is now tracking air pollution in real time, enabling data-driven and rapid responses. Strong enforcement actions are being taken to reduce emissions from industries, vehicles, transport, agriculture and construction.

However, technology alone is not enough. Public awareness and engagement are at the heart of this mission. The government is building a citizens’ movement for clean air through schools, media, social platforms and local communities. Environmental education and responsible waste management are being integrated into school curricula, helping students become champions of clean air and sustainability from an early age. Through awareness drives and citizen reporting apps, we are empowering people to act, advocate and adopt cleaner practices in daily life.

Clean air is not a privilege; it is a right. Together, through innovation, enforcement, education and public partnership, and under the visionary leadership of the Chief Minister, we are making every breath in Punjab a breath of progress and shared responsibility.

English Biscuit Manufacturers

ENGLISH Biscuit Manufacturers (EBM), Pakistan’s largest food FMCG company, has once again partnered with DAWN Media Group for the Breathe Pakistan Climate Initiative. At the forefront of the private-sector conversation on the global climate crisis and its potential solutions, EBM stands by its unwavering commitment towards sustainability and creating a greener future for Pakistan.

The numbers and predictions are harrowing for Pakistan, which is the fifth most climate-vulnerable nation globally while contributing under one per cent to global carbon emissions that disrupt environmental health. We, as a nation, continue to face erratic precipitation patterns, droughts and extreme climatic conditions that have caused our average temperature to rise by 0.5°C over the past 50 years. This seems like a small number, but the consequences of it are enormous.

“It is not just about raising awareness. It is about engaging key stakeholders to spark policy changes, sustainable practices by corporate leaders, and stronger environmental regulations that can lower industry emissions across the country,” said Mr Shahzain Munir, Executive Director of EBM. “Addressing the urgent climate challenges requires a united front. Partnering for change is not just an option, it is a necessity; it is what our country needs from us,” added Mr Munir.

Under its #NourishTheWorld initiative, EBM has embedded sustainability into its business philosophy, aligning business growth with environmental and social responsibility. EBM has transitioned to 4pc green energy, and has also been able to reduce GHG emissions by 4pc, with a target to reach Net Zero by 2050.

Alongside generating clean energy, EBM actively leads upcycling and waste management through strategic partnerships. It has furthered the climate cause through the construction of roads made entirely from multi-layered plastic (MLP) waste, offsetting 42 tonnes of GHG carbon emissions. The company continues to invest in sustainable practices, such as diverting plastics from landfills, and transforming waste into valuable products that empower local communities.

EBM’s ongoing partnership with Breathe Pakistan highlights the critical role large-scale private companies play in collaborating with the public sector to reduce the adverse effects of climate change.

Nishat Group

NISHAT Group is set to bring meaningful change to Pakistan’s auto sector through New Energy Vehicles (NEV). This partnership with Breathe Pakistan aligns with the Group’s strategic vision to drive sustainable business growth that is environmentally responsible. It is about more than mobility; it is about reshaping the future of the nation by driving change where it matters most.

The transport sector in Pakistan is one of the largest sources of emissions. In 2023, it produced around 43.3 million tonnes of carbon diocese (CO2), accounting for 22 per cent of the country’s total emissions, with 98pc of it coming from road vehicles. These figures underline the urgent need for sustainable mobility and clean energy solutions.

Nishat Group is playing its part by introducing a lineup designed to directly reduce emissions. The Omoda E5 and Jaecoo J6, both fully electric, deliver zero tailpipe emissions. Replacing conventional cars with EVs prevents tonnes of CO2 from entering the atmosphere each year, and, if adopted at scale, the impact will be transformative.

Adding to this effort is the Jaecoo J7 SHS PHEV, which combines electric drive with hybrid flexibility. The technology can significantly reduce emissions depending on usage. Together, these vehicles offer Pakistani consumers both choice and responsibility, supporting the country’s environmental goals.

Aligned with the National Electric Vehicle Policy 2025-30, which targets 30pc of all new vehicle sales to be electric by 2030, Nishat Group’s contribution goes beyond product innovation. The policy itself is expected to cut carbon emissions by about 4.5 million tonnes per year, reduce healthcare costs by nearly 405 million US dollars due to better air quality, and save 2.07 billion litres of fuel annually. These numbers show how vital the shift to NEV will be for both people and the planet.

The automobile sector is the starting point for sustainable change, but the journey requires collective action. Consumers, businesses and government must expand charging infrastructure, strengthen renewable energy integration and encourage adoption. Every EV or PHEV that replaces an internal combustion vehicle brings Pakistan closer to its 2030 and 2060 transport targets.

The vision of a cleaner, better and healthier Pakistan needs a strong foundation built on sustainability. Nishat Group is leading this transformation in the automobile sector through NEVs, setting the direction for responsible progress. By championing cleaner energy and sustainable business growth, Nishat Group is turning this vision into a new chapter for the nation’s future.

Bank of Punjab

THE following is a Message from Zafar Masud, President and CEO of Bank of Pubjab:

At the Bank of Punjab (BOP), we firmly believe that safeguarding the environment is not just a matter of policy—it is a responsibility that defines our future. Few challenges are as urgent and far-reaching as Pakistan’s air pollution crisis, which impacts our public health, reduces productivity,

and erodes the quality of life for millions of people.

As a financial institution with deep roots in our communities, BOP recognises that we must be part of the solution. Over the past year, during one of the worst smog seasons in Punjab’s history, we acted decisively to install air purifiers across our branch network to ensure cleaner air for our employees and customers. This was not only an act of care, but also a statement of our commitment: environmental well-being and human wellbeing must go hand in hand.

Beyond immediate interventions, we are investing in a sustainable future through our financing portfolio. Our initiatives include green financing for renewable energy, sustainable agriculture programs, and ESG-aligned lending that encourages businesses to adopt cleaner technologies and reduce their carbon footprint. These efforts are designed to create ripple effects across industries, aligning economic growth with environmental responsibility.

We also see air pollution through an economic lens: it is a silent tax on productivity, healthcare systems, and overall GDP. By financing cleaner technologies, supporting eco-friendly mobility solutions, and incentivizing industries to adopt greener practices, BOP is committed to reducing the economic burden of air pollution on Pakistan’s economy.

Through our partnership with the Agence Française de Développement (AFD), BOP has further deepened its role in promoting sustainable finance. This collaboration has enabled us to channel long-term, concessional funding into renewable energy, energy efficiency, and climate-resilient projects across Pakistan. The facility with AFD not only strengthens our capacity to support businesses and households in adopting cleaner technologies, but also positions BOP as a catalyst for green transformation within the financial sector. By leveraging international climate finance, we are ensuring that Pakistan benefits from global expertise and resources to combat air pollution and transition towards a low-carbon economy.

Our sponsorship of the Dawn Media Breathe Pakistan Conference is a continuation of this commitment. We see this platform as a critical space to share knowledge, align stakeholders, and forge collective action towards cleaner air. We are proud to stand alongside thought leaders, policymakers, and innovators in advancing the dialogue on how Pakistan can breathe easier, live healthier, and build a sustainable future.

For us at BOP, this is not just corporate responsibility—it is our pledge to future generations. The air we breathe today must not compromise the tomorrow we promise them.

Bank Alfalah

BANK Alfalah sets out its approach to sustainable finance, treating climate action and clean air as a strategic business imperative rather than a discretionary cause. Pakistan’s economy is increasingly shaped by climate shocks and urban air pollution that disrupt financial systems, harm customer livelihoods, and threaten business continuity. In response, the Bank has integrated climate considerations into core risk management and lending, directing over Rs26.6 billion to green banking initiatives in clean energy, sustainable housing, and climate smart agriculture, sectors central to long term resilience.

A key pillar is collaboration with the International Finance Corporation (IFC) on a comprehensive green banking roadmap that strengthens impact measurement and embeds sustainability across portfolios and operations. On the ground, the Bank’s green infrastructure includes 155 solar-powered ATMs, Pakistan’s first solar hybrid branch in Sheikh Bhirkho, and verified offsets totaling 193 tonnes of CO2, linking energy transition to improved urban air quality.

Climate resilience also informs community response. Following the 2022 floods, a two-phase Flood Relief Programme, backed by a \$10 million donation from the Chairman, combined emergency assistance with long term rehabilitation, reflecting a holistic view of climate responsibility.

By funding 13 air quality monitors across Karachi and co publishing the Karachi Emissions Inventory with Pakistan Air Quality Initiative (PAQI) and the Institute of Business Administration (IBA), Bank Alfalah has created the city’s first evidence base for addressing air pollution, guiding public decisions and channeling capital to interventions that drive the emission reductions at the source.

Nature based solutions complement this urban focus. Through the Green Way Forward with WWF Pakistan, the Bank has planted 35,000 mangroves, progressing towards a pledge of 100,000 trees by 2030. These ecosystems sequester carbon, buffer storms, and support cleaner coastal environments.

The Bank aligns its sustainability framework with the United Nations Sustainable Development Goals (SDGs) and prepares its sustainability report in line with GRI standards to ensure transparency. Partnerships with WWF Pakistan, IFC, and Akhuwat are building replicable models that combine financial inclusion, environmental stewardship, and community resilience. Expansion into ESG linked products, green bonds, and clean energy financing signals the next frontier. Internally, digital transformation amplifies impact: 93 per cent of account openings are now paperless and 81pc of transactions are digital, reducing emissions and cost. The aim remains consistent, finance the conditions for shared prosperity, while Bank Alfalah continues to invest in a more resilient, inclusive, and breathable Pakistan.

NDRMF

AIR pollution has become one of the biggest health and development challenges of Pakistan. From thick winter smog in Lahore to rising respiratory illnesses in Karachi, poor air quality is no longer just an environmental concern, it’s turning out to be national crisis. The World Health Organisation estimates that millions of premature deaths worldwide are linked to polluted air, and Pakistan ranks among the top of the listed countries.

The reasons are well-known to us. Unchecked vehicular emissions, industrial smoke, crop residue burning, open waste dumps and rapid urbanisation, and fast disappearance of green spaces in the name of development. The result is toxic air that chokes our cities, damages crops, burdens the health systems, and significantly hampers the economic productivity. It is an another slow-onset disaster, less visible than floods or earthquakes but equally destructive to the lives and livelihoods of people. Conventionally known as an environmental issue, it has now become a development and disaster risk challenge.

This is where the National Disaster Risk Management Fund (NDRMF) can make a real difference. Established to strengthen Pakistan’s resilience against disasters and climate change, NDRMF has the mandate and capacity to tackle air pollution as part of its broader risk reduction agenda.

NDRMF is stepping ahead to deal with this challenge on multiple fronts. By investing in air quality monitoring systems, it will be generating reliable data to inform early warning systems. This data will be incorporated into NDMR Natural Catastrophic Model to generate more encompassing and holistic scenarios for informed policy decisions. In partnership with relevant government departments and academia, NDRMF has developed a specific air quality indexing project aimed at strengthening the monitoring capacity of air pollution in key cities.

Similarly, NDRMF will be supporting initiatives in clean

energy and green technologies, such as solar solutions, decarbonisation of industrial sectors to cut greenhouse gases and local pollutants. By supporting urban forestry, green belts, and awareness campaigns, it has engaged citizens directly in creating cleaner, healthier cities.

Equally important, NDRMF acts as a bridge between government, private sector, and development partners mobilising resources, piloting innovative solutions and scaling up viable solutions. Pakistan cannot afford to treat air pollution as background noise anymore. It is a public health emergency, an economic drag, and a climate challenge all blended into one. With its ability to catalyse action and investment, NDRMF can put clean air at the heart of national resilience planning and help Pakistan breathe easier and build a safer future.

Trinasolar

CLEAN air and climate resilience are deeply linked. With over 128,000 deaths annually in Pakistan linked to air pollution, much of it from burning fossil fuels for energy, the shift to renewables is a critical step towards cleaner air and public health. Trinasolar, a global leader in smart solar and energy storage solutions, is helping accelerate that transition through advanced solar technologies and ESG-driven operations.

The company’s mission “Solar Energy for All” is backed by action. Trinasolar operates in over 180 countries and tops global shipment of 210mm modules, with over 170GW shipped by the end of 2024. Its photovoltaic products have set more than 35 world records in solar cell efficiency and module output. It is also the first module manufacturer to achieve mass production of 700 W+ n-type TOPCon modules. This technological leadership translates into real environmental impact.

In China’s Gobi Desert, Trinasolar is supplying 210MW of its high-efficiency Vertex N 720W modules to a 1GW solar-storage project expected to generate 1.72 billion kWh annually. It will reduce carbon dioxide emissions by 1.424 million tonnes, displace 519,000 tonnes of coal, and cut sulfur dioxide and nitrogen oxides by 173.7 and 261.4 tonnes. The installation also promotes ecological restoration by mitigating wind erosion, stabilising sand, and encouraging vegetation growth across the arid site. This integration of renewable power and land recovery exemplifies Trinasolar’s model of solar innovation and environmental benefits.

Trinasolar sets new benchmarks for the global industry by fostering best practices, world-class quality standards and sound policies. Its Yiwu facility received a rare four-star Zero-Carbon Factory and Zero Waste Landfill certificate from TÜV Rheinland. The World Economic Forum recognised Trina as its inaugural Global Growth Company Industry Shaper for the solar sector in 2010. Trinasolar is also the first company certified under the Solar Stewardship Initiative’s ESG Standard and has received the AA rating — the highest available — for full solar supply chain traceability from TÜV Rheinland.

Trinasolar has also been honored with numerous accolades, including the Forbes China Top 50 Innovative Companies, the 2024 Fortune China ESG Impact List, the European Union Chamber of Commerce’s Decarbonisation Leader, and Bloomberg Green ESG 50 list, earning the title of Leading Champion for its outstanding performance in the environmental, social and governance field. These third-party verifications underscore Trinasolar’s leadership in responsible sourcing and environmental compliance.

Trinasolar is shaping the future of energy, where advanced solar solutions drive real progress on climate, air quality and equity.

Pakistan Cables

BECOMING a sustainability leader requires big changes, but the effort is worth it — in both environmental and economic terms. Pakistan Cables is the country’s premier and most trusted cable manufacturer since 1953. As Pakistan’s first and oldest cable manufacturer listed on the Pakistan Stock Exchange in 1955 with a leading global presence, it has continued to set benchmark practices in the industry. For over 70 years, providing end-to-end solutions to its customers by offering a versatile product portfolio of Wires & Cables, aluminium sections for architectural applications, copper rod, PVC compound and wiring accessories.

Greener product solutions: Pakistan Cables is the exclusive manufacturer of the ACCC® conductors in Pakistan, which is a revolutionary technology for efficient transmission system. Pakistan Cables Limited introduced ACCC® Conductor in Pakistan in collaboration with CTC Global, USA. SCS Global Services (SCS) verified that ACCC® Conductor reduces CO2 emissions associated with transmission line losses up to 31 per cent compared to conventional steel reinforced ACSR conductors. To the best of our knowledge, Pakistan Cables is

CRISIS VS OPPORTUNITY

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mechanisms supported by UN agencies and multilateral development banks can facilitate knowledge exchange through the underutilised regional environmental cooperation frameworks. A proposed South Asian Clean Air Fund, to be capitalised at \$5 billion through member country contributions, international development banks, and carbon market revenues, could finance cross-border monitoring systems, technology transfer programmes and joint pollution control projects.

IMPLEMENTATION ROADMAP

Pakistan’s transformation requires a carefully sequenced three-phase approach across all four tracks simultaneously. Phase-I (2025-26) focuses on foundation building by designating dedicated carbon market authority, securing manufacturing partnerships, developing integrated transit master plans, initiating agricultural technology subsidies, structuring industrial modernisation incentives, and creating bilateral air quality dialogue mechanisms with India.

Phase-II (2027-30) emphasises scaling and consolidation by deploying 2.5 million EVs annually through carbon credit financing, constructing integrated transit systems, achieving 30pc reduction in crop residue burning, and implementing mandatory industrial emission standards with comprehensive technology transfer support.

The metrics of interest should be to achieve 40pc reduction in PM2.5 levels compared to 2024, generate \$20 billion in reduced health and productivity costs, create 500,000 green jobs, and to establish Pakistan as the recognised regional powerhouse in clean air innovation and cross-border environmental cooperation.

The path forward is unambiguous. No other developing nation has attempted carbon market financing at this scale, integrated with comprehensive sectoral transformation and regional diplomacy. The proposed framework positions Pakistan as the architect of South Asia’s environmental future. When Punjab’s children breathe clean air by 2030, when Pakistani EVs export to global markets, and when carbon credits fund the nation’s green transition, the world will study Pakistan’s blueprint. This is not environmental policy. This, instead, is an

also the first cable manufacturer in Pakistan to provide KEMA certified Low Smoke Zero Halogen (LSZH) Power Cables.

Sustainable operational excellence: In 2023, Pakistan Cables became the country’s first building material company to have its science-based emission reduction targets validated and approved by SBTi. It was also among Pakistan’s first 5 companies at the time to do so. The company’s science-based emission reduction targets are part of its long-term vision to develop its net zero strategy.

Earlier in 2021, Pakistan Cables became one of the 26 Pakistani companies and the only building materials company that signed the pledge for Business Ambition 1.5°C ahead of COP26. As ISO 14001 certified company, complying to environmental regulation and adding value over the years in the arena has been a fulfilling journey. Reusing its wooden cable drums, using bio-degradable packaging material for some of its product lines, using tote bags over paper-based bags, and reusing and reducing usage of plastics were some of the earliest practices incorporated.

Today, the new manufacturing facility at Nooriabad, Sindh, is set to transform the industry. Equipped with latest technology, the Pakistan Cables factory at Nooriabad is also driving the company’s sustainability agenda. The water treatment plan and 2 MW on-grid solar power plant were successfully commissioned during FY 2023-24. The Nooriabad factory is also home to Pakistan’s first and largest Miyawaki-based urban forest on an industrial estate. The Pakistan Cables urban forest is spread across 3 acres of land with approximately 50,000 trees. The Company has partnered with the World-Wide Fund for Nature (WWF Pakistan), and Clifton Urban Forest Karachi among others to lend support to green initiatives.

It is a member of the Amir S. Chinoy Group (ASC). The ASC Group has been at the forefront of Pakistan’s industrial development for over 70 years. Today, the ASC Group includes two other listed companies, International Industries Ltd., International Steels Ltd. and Chinoy Engineering & Construction (Pvt.) Ltd.

As a signatory of the United Nations Global Compact, all CSR related activities are aligned with the UN’s Global Sustainable Development Goals (SDGs). The Company continues to shape a sustainable future in the industry, inspiring others to follow.

Inverex Group

PAKISTAN today faces one of the gravest environmental challenges of our time — air pollution. Our cities rank among the most polluted in the world, with dangerous levels of smog and particulate matter threatening not only the environment, but also the health and wellbeing of millions of people. Moreover, air pollution has emerged as a silent public health emergency, causing respiratory illnesses, cardiovascular diseases, and reducing life expectancy across urban and rural communities alike. Alongside human health, our ecosystems are also suffering — soil, water, and agricultural productivity are being degraded, putting long-term sustainability at risk.

Urban centres, in particular, are highly vulnerable. Rapid industrialisation, unchecked vehicular emissions, and reliance on fossil fuels have accelerated pollution, leaving citizens exposed to unprecedented risks. It is clear that urgent and innovative solutions are needed if Pakistan is to secure a healthier, cleaner, and more sustainable future. At Inverex Group, we believe clean energy is central to addressing this crisis. Since our inception, our mission has been to provide reliable and eco-friendly energy alternatives. Through our wide range of solar solutions, we are enabling households, businesses, and industries to shift towards renewable energy, reducing dependence on fossil fuels and mitigating emissions.

Taking this commitment further, Inverex has also introduced an economical electric vehicle (EV) to Pakistan’s market — making clean mobility more accessible. This initiative represents a bold step towards reducing vehicular emissions, one of the largest contributors to air pollution in urban areas. By promoting EV adoption, Inverex aims to transform the way Pakistanis commute, while contributing positively to global climate change goals.

Beyond innovation, customer service remains at the heart of our operations. With more than 35 service centres nationwide, Inverex ensures that customers receive the highest level of support, reinforcing trust and reliability in its solutions. Importantly, Inverex’s vision now extends beyond Pakistan. With a growing footprint across the Middle East and Africa, it is proud to represent Pakistan on the global renewable energy stage, contributing to a cleaner and greener world.

Air pollution may be a pressing challenge, but with innovation, commitment, and collective effort, Pakistan can build a healthier and more sustainable future. Inverex is proud to lead this transformation — empowering people, protecting ecosystems, and paving the way for a cleaner tomorrow. — *Ahad Ghori, Coo, Inverex.*

economic strategy disguised as climate action. The next five years will determine whether Pakistan emerges as a new player in South Asia’s clean air landscape, or remains captive to the reform inertia that has squandered every previous opportunity for national renewal.

The writer is a climate change and sustainable development expert.

FINANCING CLEAN AIR

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it is possible the returns are proportionately higher as well. But incentivising domestic industries to finance a public good that will not directly accrue benefits is another story altogether.

There are precedents, though. In Bangladesh, where brick kilns, construction and vehicular emissions mirror Pakistan’s air pollution sources, the World Bank-backed Bangladesh Environmental Sustainability and Transformation (BEST) project is working to gather private capital. Central to this is a \$170 million Green Credit Guarantee Fund (CGF), financed by the World Bank, the French Development Agency (AFD), and private-sector contributions (around 70pc). The CGF supports investments in reducing emissions from brick kilns, improving waste management, and promoting rooftop solar.

For Pakistan, a similar model could be transformative. There are financial tools on the table that could help direct more money into clean air projects, but most remain underused. Green bonds, social bonds and results-based financing, for instance, could improve efficiency and draw in long-term private capital if deployed more strategically. As noted by the ‘State of Global Air Quality Funding 2023’ report, by sharing risk across governments, development partners and private investors, these instruments could unlock far greater investment in cleaner air.

Everyone breathes air. And there is a strong economic case for making sure it is clean. Regulations and incentives can push private-sector entities into policing themselves, but the proof is in the pudding — implementation of policies.

The writer is a member of staff.

FROM THE AIR WE BREATHE TO THE FOOD WE EAT NET ZERO BY 2050



At EBM, we understand that every biscuit baked, and every bite shared, begins with the same planet we all depend on. That is why we have pledged to achieve Net Zero by 2050. We are reducing our emissions across our value chain to protect the air, water, and land that sustain us. Every step we take today is towards a future where progress does not come at the cost of nature. Because nourishing Pakistan means caring for the environment that nourishes us all.



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