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Air Pollution and Neonatal & Child Health



Words by Dr Ram Hari Chapagain, Dr Bikal Shrestha and Dr Arun Kumar Noupane

Nepal records some of the highest air-pollution-related deaths in South Asia, with every citizen losing an average of 3.4 years of life expectancy.

Air pollution has become one of the most pressing public health and environmental challenges in Nepal. The scale of the crisis today extends far beyond environmental degradation—it has emerged as a major threat to economic development, social well-being, and especially in child health of Nepal. According to global estimates, nearly 7 million premature deaths occur annually due to air pollution, and Nepal bears one of the heaviest burdens in South Asia. The country records 222 premature deaths per 100,000 population, among the highest in the region, with approximately 26,000 deaths every year attributed to polluted air. On average, pollution shortens the lifespan of a Nepali citizen by 3.4 years, reflecting the severity of the situation.

Current Situation of Air Pollution in Nepal

The air quality across Nepal, particularly in the Kathmandu Valley and the Tarai, has continued to deteriorate over the past decade. Kathmandu frequently ranks among the world's most polluted cities, recently listed as the 8th most polluted with PM_{2.5} levels reaching 42.4 µg/m³, far exceeding the WHO guideline of 5 µg/m³. Nearly 98% of Nepal's population resides in areas where pollution levels surpass safe limits set by WHO. Seasonal variations worsen the crisis: pollution peaks during winter, autumn, and spring, when stagnant cold air, dry soil, and increased emissions combine, while monsoon rains offer only temporary relief.

The consequences of air

pollution on health are extensive. Air pollution contributes to 75% of COPD cases, 44% of ischemic heart disease, 46% of strokes, and 38% of lung cancers. For children, the impacts are even more alarming. Their developing lungs and immune systems make them more vulnerable to pneumonia, asthma, impaired cognitive development, and complications such as low birth weight and preterm birth. In Nepal, air pollution has become an urgent child health crisis.

Causes of Air Pollution in Nepal

Air pollution in Nepal stems from a combination of human activities, rapid urbanization, and geographical features. The major contributing factors include:

1. Residential and Household

Emissions: Around 39% of pollution originates from households using traditional cooking fuels. Only 35% of Nepali households have access to clean cooking options, making indoor and outdoor household emissions a major source.

2. Vehicular Emissions: Nepal now has more than 3.1 million vehicles, most running on fossil fuels. Old vehicles are also producing more air pollution. Road dust contributes significantly to pollution, especially since 84% of roads remain unpaved, causing large amounts of resuspended dust.

3. Brick Kilns and Industries: Nepal hosts about 1,700 brick kilns, concentrated heavily in the Kathmandu Valley. Industrial activity contributes around 13% of the country's pollution.

4. Agricultural Burning and Forest Fires: Open burning of



crops and forest fires— which increased by 76% this year— release massive amounts of smoke, especially during the dry season.

5. Transboundary Air Pollution: Pollution from northern India, particularly during crop burning seasons, significantly affects the Tarai and Kathmandu Valley.

6. Geographical Factors: Kathmandu's bowl-shaped topography traps polluted air, preventing dispersion and worsening smog levels.

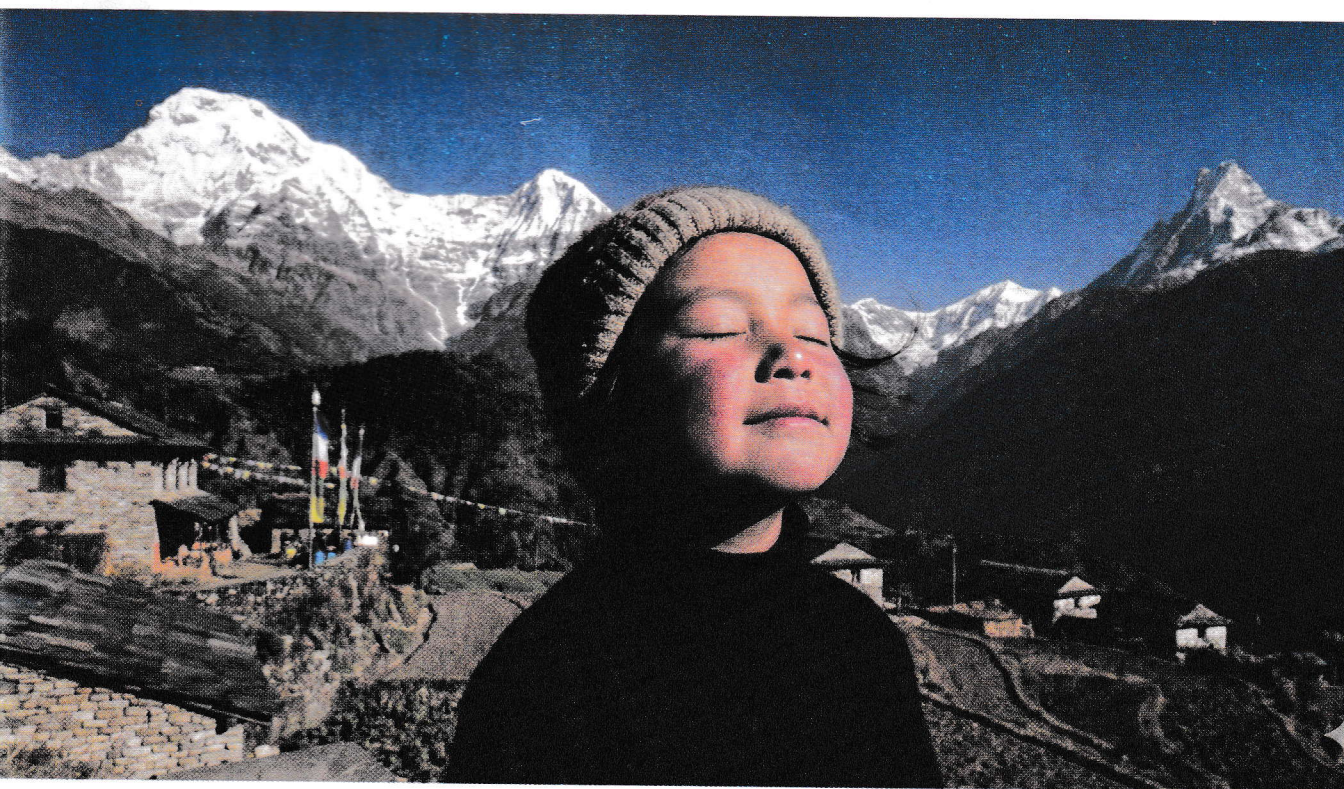
Policies and Initiatives of Nepal

Recognizing the gravity of the issue, Nepal has introduced several policies and initiatives to control air pollution. The Constitution of Nepal guarantees clean air as a fundamental right, forming the legal foundation for environmental protection.

Key government initiatives include:

Clean air is a child survival imperative and a moral obligation; no child should be forced to breathe toxic air from the moment they are born.

- **Plan (2020):** A comprehensive guideline focusing on reducing emissions, improving transport standards, promoting clean energy, and expanding monitoring networks.
- **Expansion of Air Quality Monitoring Stations:** Real-time data from cities allows better public health advisories and planning. Department of environment has given public access to the air quality data they have measured in different stations. Kathmandu Metropolitan city also has AQ monitoring in different places.
- **Policies to Promote Electric Vehicles (EVs):** Tax exemptions, charging infrastructure plans, and government EV fleets aim to reduce vehicular pollution.
- **Industrial Emission Standards:** Regulations for brick kilns and industries are being tightened, although enforcement remains a challenge.
- **Integration with Climate and Urban Development Programs:** Air quality goals are increasingly being linked with climate resilience, green city planning, and public health strategies.
- **Hospital-based surveillance**



and early warning systems: Efforts are ongoing to include air-pollution-related illnesses in national health surveillance (EWARS).

Despite these policies, effective implementation and enforcement remain the biggest challenges. Coordinated action across ministries, local governments, private sectors, and civil society is essential.

Role and Activities of NEPAS

The Nepal Paediatric Society (NEPAS) plays a crucial role in addressing the child health impacts of air pollution. As children face the highest risks, NEPAS has prioritized environmental health within its advocacy and clinical agendas.

Key contributions of NEPAS include:

Policy Advocacy: NEPAS serves as a member of the government's technical committees, influencing national policies related to child health and

environmental protection.

2. Position Papers and Evidence

Generation: NEPAS develops scientific documents that highlight the health impacts of air pollution on children, guiding policymakers and medical practitioners.

3. Capacity-building and

Conferences: The recent national conference theme, "Climate Change and Its Impact on Children," emphasized the urgent need for pediatric-focused responses.

4. International Collaboration:

NEPAS works with global bodies such as Royal college of pediatric and child health RCPCH (UK) to strengthen research, training, and advocacy.

5. Awareness and Community

Engagement: NEPAS mobilizes pediatricians, health workers, and youth to promote clean energy, behavioral change, and community-level air quality advocacy.

Conclusion

Clean air is not merely an

environmental concern, it is a child survival imperative, a development priority, and above all, a moral obligation. Nepal's children are breathing some of the most polluted air in the region, but this reality is neither inevitable nor irreversible. When we unite with science-driven policies, compassionate leadership, and unwavering commitment, we can build a Nepal where every child breathes safely and grows to their fullest potential. The causes of air pollution may be complex and diverse, yet the solutions are firmly within our grasp. With stronger policies, coordinated national action, and the dedicated work of organizations like NEPAS, Nepal has the power to protect its youngest citizens and secure a cleaner, healthier, and more equitable future for all.

(Dr Ram Hari Chapagain, Dr Bikal Shrestha , Dr Arun Kumar Neupane : All from Nepal Paediatric Society(NEPAS): This article prepared as joint action of NEPAS-RCPCH AQ-MNCH Project)