

Air pollution and the world of work in southeast Asia

Findings from regional case studies



SEI brief

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Key messages

- Case studies show how gender, age, class and other qualifications impact air pollution exposure in workplaces in four countries in southeast Asia, sometimes in unexpected ways, which points to the need for an intersectional approach to these issues.
- Informal workers in southeast Asia are more at risk from occupational air pollution exposure and are also less protected by healthcare provisions and labour protection policies.
- Most workers in the region have little awareness of the health impacts of air pollution in their place of work. Consequently, they are less likely to ask for protection or advocate for policy changes to reduce the health burden they face from occupational air pollution exposure.
- Accountability and responsibility are lacking for reducing air pollution exposure and impacts for workers, and consequently this issue remains unaddressed in the region. This gap should be remedied by long-term strategic plans to protect workers across sectors that align with national and local development priorities, while at the same time ensuring environmental compliance.

Introduction

Air pollution is a growing global threat to the environment and to human health and, by extension, to workers' health and local and national economies. Exposure to air pollution is a major leading risk factor for premature mortality, resulting in almost 7 million premature deaths globally in 2019, of which half a million are in southeast Asia. Of these, an estimated 50 000 deaths (10%) are due to occupational exposure to air pollution (IHME, 2020).

Despite the known risks, research in southeast Asia remains limited on people's exposure to air pollution at work. Existing research on occupational exposure is often focused on formal workers, usually in specific roles (e.g. traffic police or office and hospital workers; Slater et al., 2022). Yet in southeast Asia, 87% of the workforce is employed in the informal sector (ILO, 2018), where labour policies are lacking.

When considering occupational air pollution exposure, the overarching issues facing workers in specific industries also matter. Occupational exposure can be problematic for both formal and informal workers. Whereas the work environment and labour conditions are regulated for formal workers (e.g. through International Labour Organization or ILO conventions ratified in national labour laws), informal workers

COMPOSITE IMAGE (ABOVE, CLOCKWISE):
Hazy morning, Bangkok © SDRK / GETTY;
Garment worker, Cambodia © CHANDATH HIM;
Barbecue smoke, Lao PDR © ANDERS
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are often not covered by labour law and social protection systems. In many cases, the riskiest occupations are filled by informal workers who also are unprotected by labour rights, for example leaving them ineligible to take sick leave or with limited access to healthcare.

To effectively mitigate emissions and reduce the health burden from air pollution exposure requires understanding the factors that impact exposure. An SEI programme focused on understanding these factors, “Air pollution and the world of work in southeast Asia”, ran from 2021 to 2023, funded by IDRC and with research partners at the Ministry of Natural Resource and Environment in Cambodia, University of Health Sciences in Lao PDR, the Asian Institute of Technology in Thailand, and the Institute of Human Studies in Viet Nam. The programme assessed the magnitude and key sources of air pollution in different locations and furthered understanding of how different groups of a population are exposed. Understanding an individual’s experience of air pollution and the different ways they are exposed could allow for development of targeted and effective policies with massive benefits for people’s health, and the findings from this programme have led to the recommendations reported here.

Methodology

An initial scoping review was performed that identified key existing issues, research gaps and any existing policies in place to protect different groups of workers in southeast and east Asia. Following this, four independent research projects were undertaken by researchers in Cambodia, Viet Nam, Lao PDR and Thailand, which aimed to improve the state of knowledge in this region in certain occupations, both informal and formal.

The researchers in Cambodia focused on garment workers, as the garment and footwear industry employs 77% of all manufacturing workers in the country (CNV International, 2016); the industry represents the main formal employment sector, with a predominantly female workforce. The country’s Clean Air Plan (2021) highlighted that knowledge of the sector’s environmental impacts remains a major gap.

The case study in Lao PDR focused on the food vending sector, a growing source of informal jobs as the country becomes urbanized. More than 1740 outdoor charcoal grill restaurants and carts operate in the capital city, Vientiane (Governor of Vientiane Capital, 2020, as cited by Sychareun et al., 2022). Charcoal remains the major source of fuel and therefore of particulate matter (PM_{2.5}) emissions.

In Viet Nam, the case study focused on craft villages. These family-run industries in rural areas produce handicrafts alongside agricultural activities and employ informal migrant workers. In Thailand, the case study considered both informal and formal workers, indoors and outdoors, in Bangkok.

Following the finalization of the case study projects, a regional policy event was held that brought together government officials, trade union representatives, employer representatives and researchers from across the four countries. The event showcased the research outputs and facilitated a discussion on how the outlined challenges can be addressed, with a focus on three key groups in relation to occupational air pollution exposure: employers, formal and informal workers, and government agencies.

Key findings and recommendations

Here we present the findings from the programme's four case studies, with recommendations to address each issue. These recommendations stem from the case studies and the regional stakeholders workshop held in October 2022.

Occupational air pollution exposure has a gendered dimension

Pre-existing inequalities related to social identities and other socioeconomic factors related to gender, age, ethnicity, class, migrant status and other categorizations can create differentiated exposures to occupational air pollution. For example, groups with lower economic status, especially poor women, often have limited work opportunities and no alternatives to work that is hazardous. Women also often carry the disproportionate burdens of domestic care responsibilities, which limit their livelihood options even further.

Even within the same industry, gendered norms and other hierarchies can influence the type of tasks workers are assigned to or take up, leading to differentiated exposures. For example, men may be overrepresented in certain industries with high exposure (e.g. construction and mining), while women tend to have less mobility or fewer alternative livelihood options that may help mitigate exposure.

In the Lao PDR study of grilled food workers, men were identified as being preferred as the main chefs, which means they work closer to the grill and emissions, while women are more likely to work as waitstaff and spend time around both cooking and non-cooking areas (Sychareun et al., 2023). Men had higher exposures to air pollutants than women, in this case study.

In the Viet Nam study, men were found to participate more in hazardous tasks with higher exposure to air pollutants. At the same time, they also had more mobility, for example also making deliveries, while the tasks women were assigned typically are more confining, with higher concentrations of indoor air pollution, likely causing significant health burdens for these women (Thanh & Dung, 2022).

Recommendations: Given these intersectional complexities, existing social inequalities and other socioeconomic factors must be considered in policy decisions to ensure inclusive outcomes, especially when considering the transition towards green jobs.

Gendered disparities in exposure and vulnerability to air pollution need to be assessed in different contexts to ensure policy responses are appropriate to each case, and workers need to be engaged in decision-making processes to ensure inclusive outcomes.

Awareness of air pollution and its health impacts is low, resulting in low protection for workers

Interview data from the case study countries indicated that workers generally lacked awareness of occupational exposures to air pollutants, the associated health impacts, existing regulations and rights of employees, the benefits of personal protective equipment (PPE), or good practices. This was especially the case for younger workers who had the perception of being “invincible” against the impacts of air pollution exposure (Thanh & Dung, 2022).

Recommendations: Our case studies highlight that improving occupational safety and health is key, with appropriate and well-implemented laws and regulations. In addition, raising awareness of the health impacts of air pollution could empower workers to take measures to protect themselves (e.g. wear masks) and drive changes that could

protect their health such as reducing workplace emissions. Better awareness among workers and employers can also increase support for policies and motivate employers to implement improved conditions for workers. Dedicated youth-targeted measures to raise awareness on air pollution and promote occupational safety and health can encourage youth to be advocates for change throughout their careers.

Linking occupational air pollution to economic costs (e.g. lost productivity, increased sick leave) could persuade employers to develop, enforce and implement more policies to protect workers. An example is the ILO initiative “Decent Work in the Garment Sector Supply Chains in Asia” (2019–2022), which includes a focus on enhancing environmental sustainability through gender-responsive guidance on regulatory and enforcement capacities (ILO, 2019). More research on the specific sources of air pollution exposure at work and mitigation options, as well as directly assessing the health burden workers face due to their occupations, also could help.

Informal workers are more exposed and less protected

Informal workers can face more exposure air pollution than formal workers, and they are often missed by typical social protection systems. Discussions at the regional workshop highlighted that formal and informal workers have different needs when it comes to mitigating their exposures to air pollution, as informal workers may be self-employed or unable to make demands of employers, but that there should be no distinction when it comes to health and safety provision and social security. However, the reality remains different.

In an interview about working conditions, an employer in a craft village in Viet Nam described the situation as follows: “All employees are freelance, so there are no regulations on occupational safety and there are no contracts either. Now you don't have a job, so you come to me, I give you the job, but you have to take care of yourself. If you have an accident, you are on your own” (Thanh & Dung, 2022, p. 107).

Also highlighted by the case studies was a difference in healthcare provisions between countries. For example, in Thailand, universal healthcare coverage is available for both formal and informal workers, while in Viet Nam, healthcare coverage only covers those working in the formal sector and who are paying social security (Thanh & Dung, 2022).

Informal workers are more likely to be performing work in their homes or close to their homes. In Thailand, 3.7 million people do home-based work; most of them are women and 70% of the whole are working informally (Poonsab et al., 2019). Overall, Asia is home to two-thirds of the world's 260 million home-based workers (Bonnet et al., 2021). This means that members of their families, including vulnerable groups such as children and the elderly, may also be at risk of increased air pollution exposure if the work involves emissions-generating activities such as cooking. Awareness among workers of the health burden that their work could have not only on themselves but on their family could promote the use of PPE, improved technology or increased ventilation to reduce exposure for all those affected, dependent on whether they or their employers could take on the cost burden.

Recommendations: Policies should be updated to protect informal workers, to ensure that both formal and informal workers are protected by social policies such as labour protection laws and healthcare, and campaigns should ensure they know what their rights are when it comes to asking for protection. Local agencies or decentralized institutions can also monitor the informal sector to flag issues of concern with regard to air pollution exposure.

Strengthened agency collaboration will lead to more effective policies

The regional workshop highlighted a current lack of integration between different ministries such as those for labour, environment and health. Collaboration needs to be strengthened between such agencies in order to ensure that policies are developed holistically and enforced across different ministerial sectors (e.g. agriculture, industry, energy, labour, health, law). At present, a lack of accountability remains for the impacts of occupational air pollution, and consequently, this issue “falls through the gap”, as most countries in the region have no single responsible agency.

Recommendations: National air pollution monitoring and controls should be the clear responsibility of a single agency with the remit to mandate pollution controls across sectors through collaboration with relevant ministries. Steps could include the development of emission inventories, increased air quality monitoring including personal exposure measurements, and the development of health impact assessments – all of which could provide evidence to drive policy change and increase awareness. This should be underpinned by long-term strategic plans and specific policies to protect workers across sectors, aligned with national and local development priorities, while at the same time ensuring environmental compliance.

Conclusion

This research project highlighted commonalities relating to the sources and impacts of air pollution in workplaces in southeast Asia. For example, exposure to air pollution from grilling street food is an issue for street food vendors regionally. Regional cooperation can enable the identification of common solutions that can be shared across the region, including technological solutions to address ambient and transboundary air pollution, knowledge sharing on effective measures to address occupational air pollution exposure and the health and economic benefits of doing so, and assessments of the effectiveness of policies and barriers to implementation.

The project highlighted that increased evidence and data, as well as transparent data on air pollution concentrations at the workplace, could better inform employers and employees on the impacts of air pollution and provide more evidence for the development and implementation of protective policies.

Currently, in many southeast Asian nations, economic growth and air pollution control are treated as irreconcilable. This area should instead be seen as an opportunity for more sustainable development, which could reduce poverty, improve health and well-being, build resilience of cities, enhance gender equality and meet several other Sustainable Development Goals and climate ambitions.

Discussions from the regional workshop discussion underscored that space exists to introduce technological solutions and, perhaps more importantly, to challenge the framework of a highly polluting growth model, by thinking about transforming economic models in the transition to a green economy. Enhancing regional cooperation and collaborations is necessary, including strengthening more inclusive stakeholder interactions that includes key actors not only from government and industry, but also from both labour unions and civil society.

References

- Bonnet, F., Carré, F., Chen, M., & Vanek, J. (2021). *Home-Based Workers in the World: A Statistical Profile*. WIEGO Statistical Brief No. 27. <https://www.wiego.org/publications/home-based-workers-world-statistical-profile>
- CNV International. (2016). *Country Study Cambodia 2016 - Labour Standards in the Garment Supply Chain*. <https://www.socialdialogue.org/2018/04/13/country-study-cambodia-2016-labour-standards-in-the-garment-supply-chain/>
- IHME. (2020). *Global Burden of Disease Study 2019 (GBD 2019) Results*. Seattle: Institute for Health Metrics and Evaluation (IHME). Available from <https://vizhub.healthdata.org/gbd-results/>.
- Governor of Vientiane Capital. (2020). *Annual Urbanization Report*. Unpublished report.
- ILO. (2018). *Women and Men in the Informal Economy: A Statistical Picture*. Geneva: International Labour Organization. https://www.ilo.org/global/publications/books/WCMS_626831/lang--en/index.htm
- ILO. (2019). *Decent Work in the Garment Sector Supply Chains in Asia*. Factsheet. Geneva: International Labour Organization. https://www.ilo.org/asia/publications/WCMS_679334/lang--en/index.htm
- Poonsab, W., Vanek, J., & Carré, F. (2019). *Informal Workers in Urban Thailand: A Statistical Snapshot*. WIEGO Statistical Brief No. 20.
- Slater, J., Han, J.Y.-C., Adelina, C., Nikam, J., Archer, D., Nguyen, H., & Kim, D. (2022). *Air Pollution and the World of Work: Policies, Initiatives and the Current Situation – A Scoping and Evidence Review for Southeast and East Asia*. SEI report. Stockholm Environment Institute. <https://doi.org/10.51414/sei2022.040>
- Sychareun, V., Vongxay, V., Thongmixay, S., Somphet, V., Phimmavong, C., Phommavongsa, P., Thammavongsa, V., Chaleunvong, K., & Joanne Durham. (2022). *Air Pollution Among Grill Workers in Lao PDR: Issues of Inequalities and Gender*. Unpublished report.
- Sychareun, V., Vongxay, V., Thongmixay, S., Durham, J., et al. (2023). *Exposure to Barbeque Smoke in Vientiane, Lao PDR: Gendered Disparities and Unequal Exposures for Grillers*. SEI brief. Stockholm Environment Institute. <https://doi.org/10.51414/sei2023.001>
- Thanh, V. T., & Dung, L. T. D. (2022). *Intersectional Impacts of Air Pollution on the World of Work of Informal Labour Groups in Craft Villages in Hanoi, Vietnam*. Viet Nam: Institute of Human Studies. http://ihs.vass.gov.vn/noidung/htquocte/Lists/DoiTac/View_Detail.aspx?ItemID=47

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