Air Pollution in Laotian Cities: an Airsheds Approach

Strengthening Regional Cooperation To Tackle Air Pollution Challenges In Asia And The Pacific

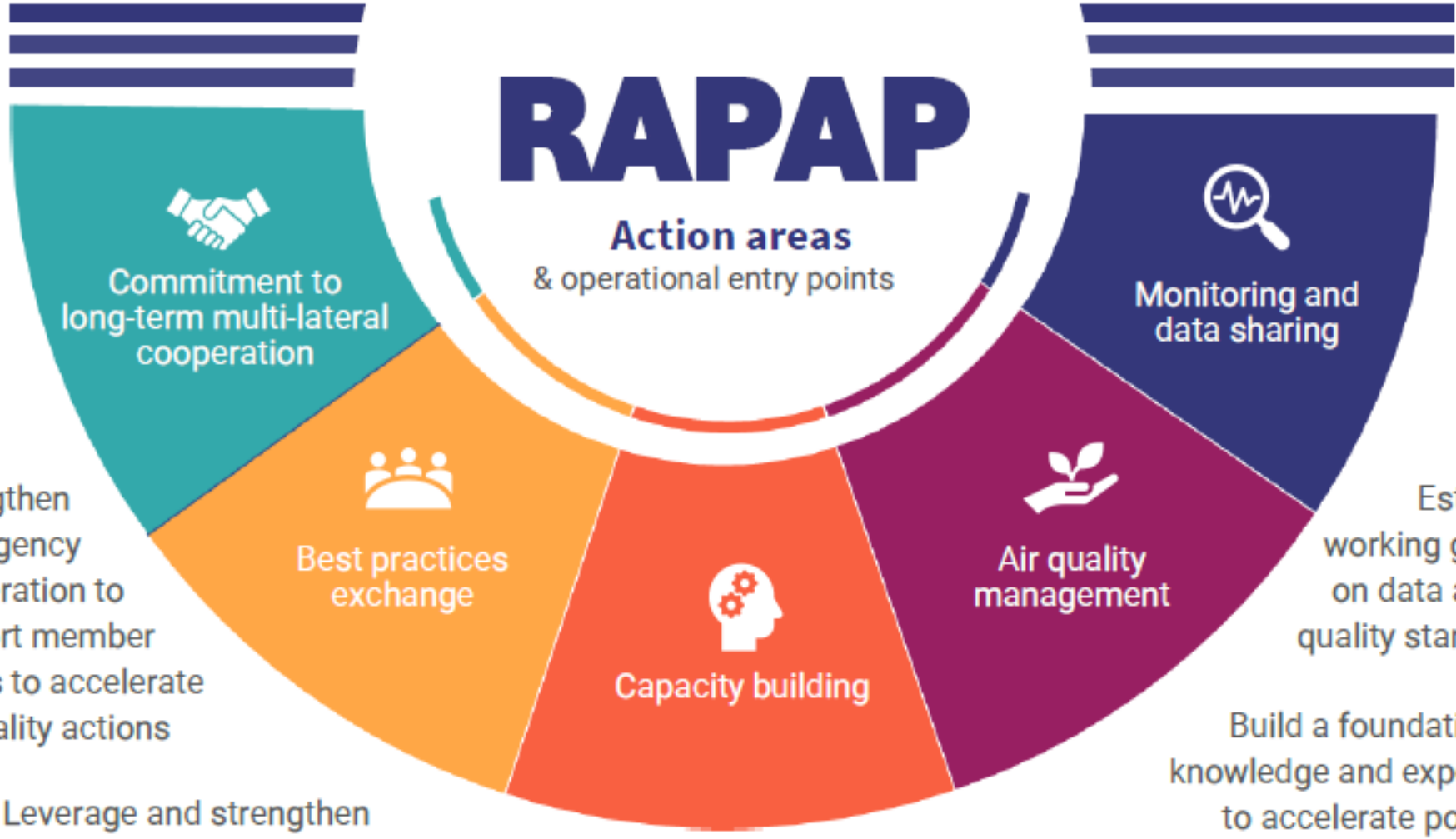


UNITED NATIONS
ESCAP
Economic and Social Commission for Asia and the Pacific

Image credit: V T. Polywor

RAPAP

Action areas
& operational entry points



Strengthen interagency cooperation to support member States to accelerate air quality actions

Leverage and strengthen connections among existing subregional initiatives to enhance exchange of knowledge and best practices and identify key capacity gaps

Mobilize support from member States for pilot projects/initiatives and facilitate bilateral and multilateral cooperation

Link to global initiatives and networks such as the Climate and Clean Air Coalition (CCAC)

Build a foundation of knowledge and expertise to accelerate policies and practices

Establish working groups on data and air quality standards

Project Context

The Asia-Pacific region is **rapidly urbanising** and will become mostly urban in the next decades.

This rapid urban expansion increases:

- Increases infrastructure development and energy consumption
- Raises demands for fossil fuel in the transport sector
- Adds to household pollution from cooking and heating/cooling
- Gives room for improper waste management

All of which unavoidably contribute to the region's worsening air pollution….

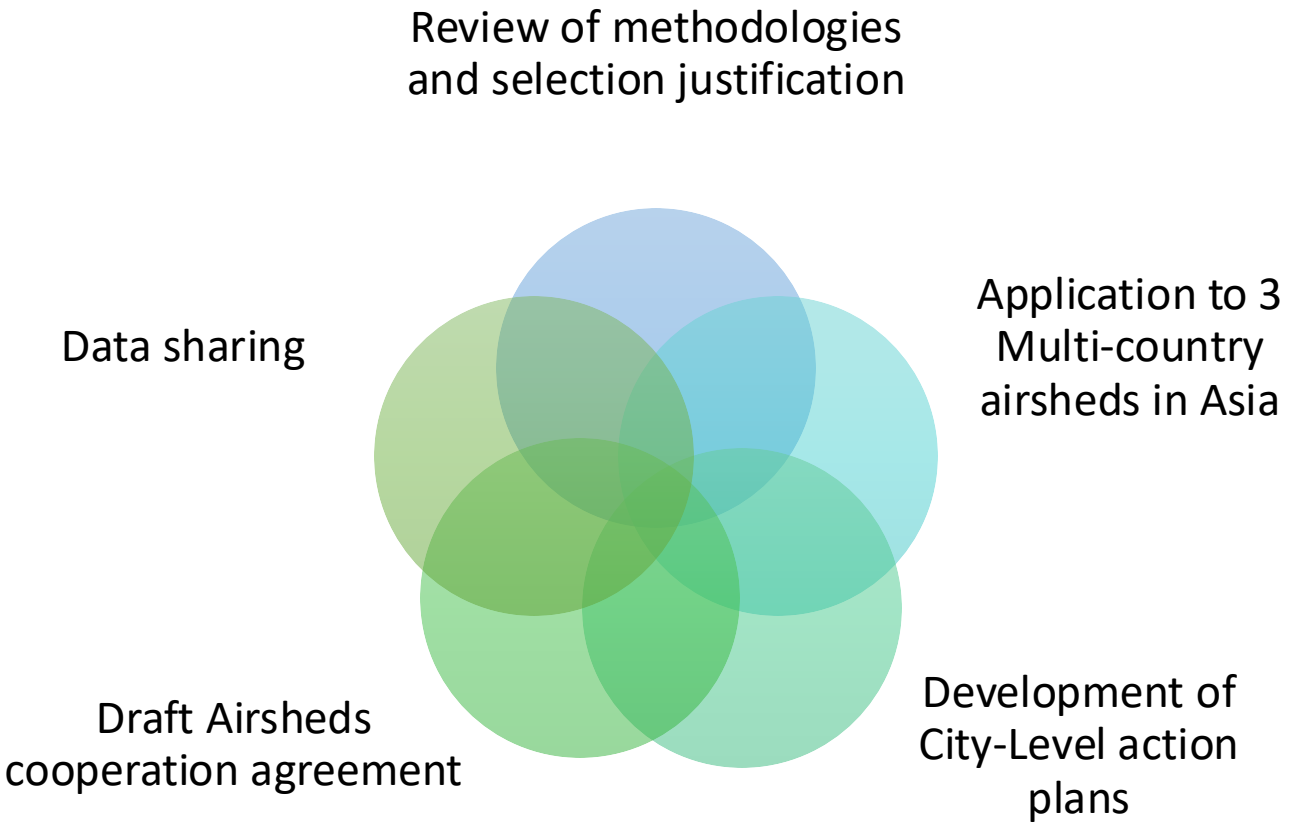


Project Goals

The project will focus on the improvement air quality in multi-country airsheds.

The engagement of stakeholders at all levels of jurisdiction will enhance regional cooperation and strengthen collaboration among cities/subnational authorities and national governments.

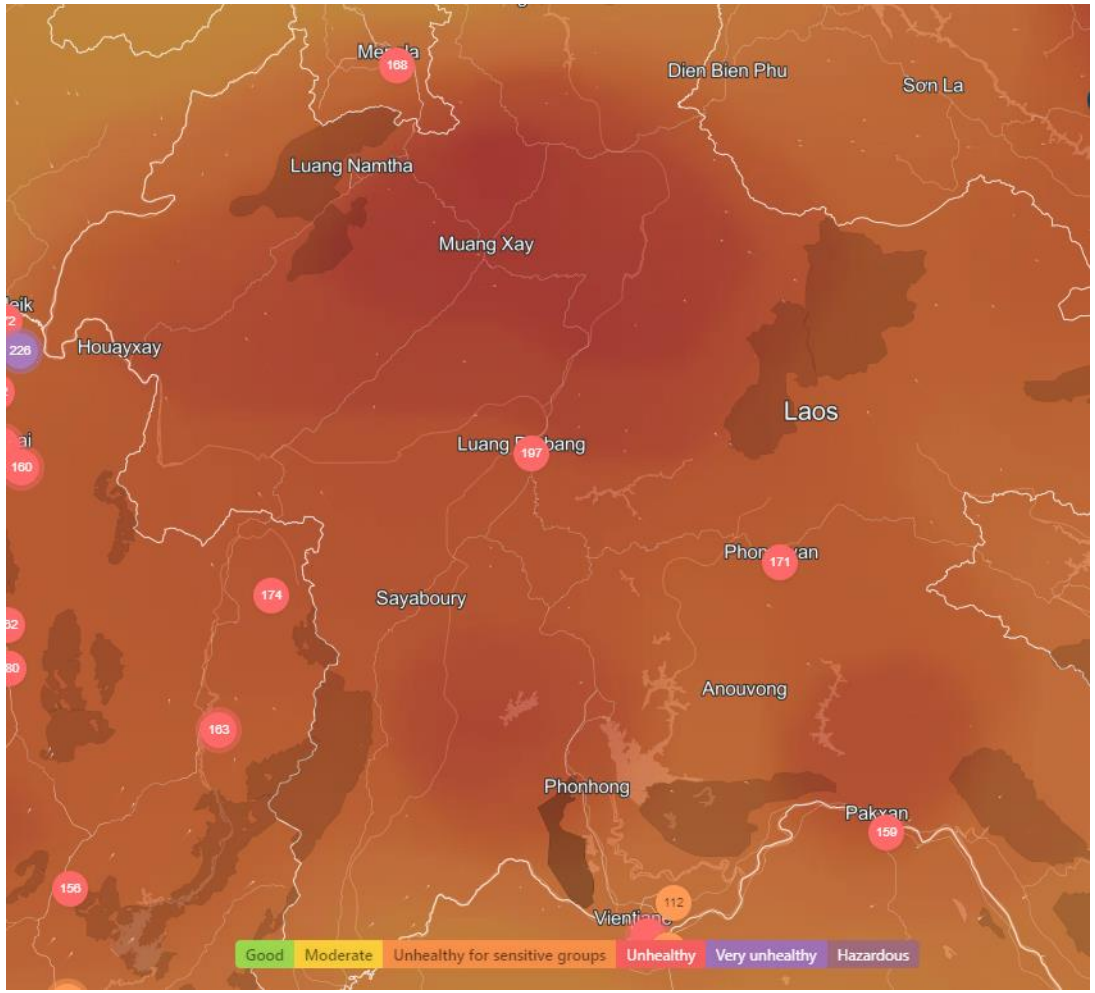
Project Activities 2024-2026



Airsheds Definition:

A geographic area affected by the same air mass defined by topography, meteorology and/or climate.

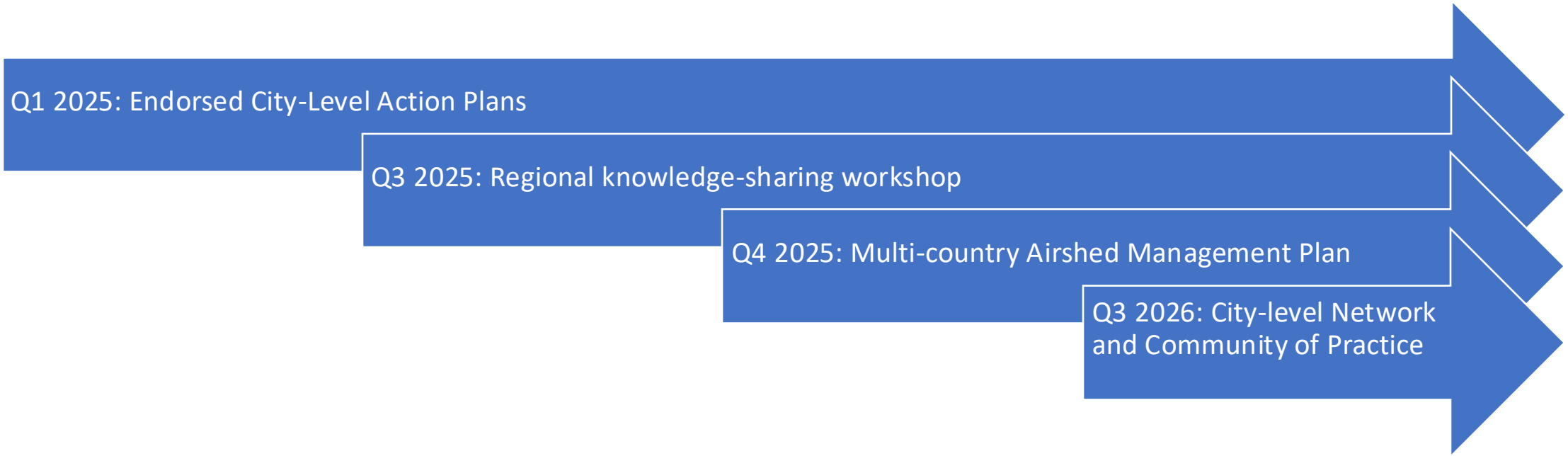
Air quality within the airshed will depend on pollution sources within it, but not outside it.



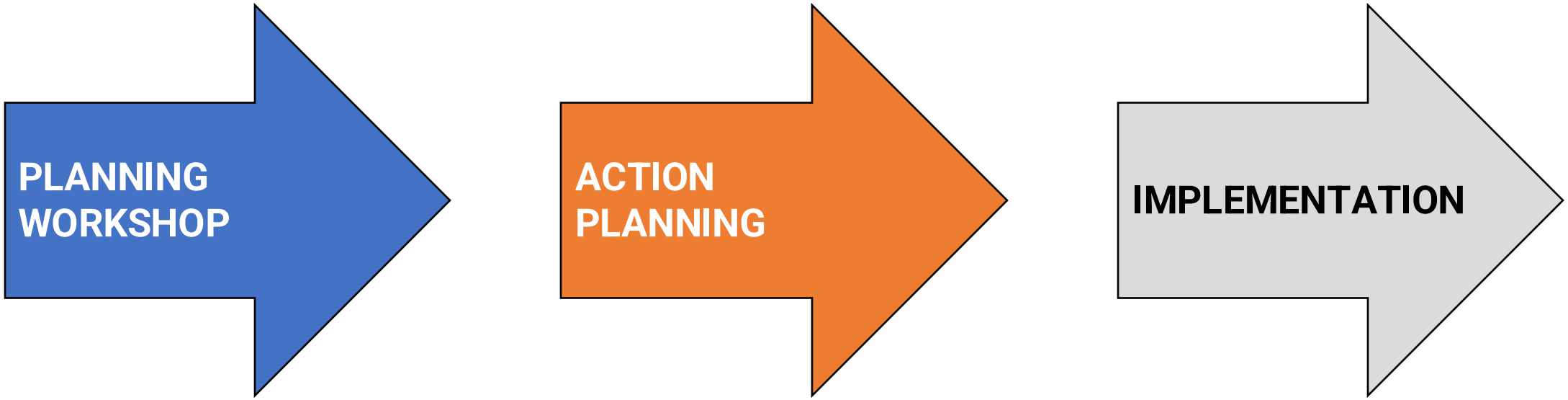
Project Timeline: Support Science-Based Policy



Project Timeline: Establish Networks



Upcoming Activities: Pilot Cities



An Expert Group Meeting to review air pollution trends and analysis in the region to **identify goals** of the Action Plan

Stakeholders in pilot cities develop action plans to **effectively improve air** quality for resilient and sustainable urbanization

Stakeholders in pilot cities to launch Action Plan, and **measure and monitor** the project outcomes in order to fine-tune the approach

City Workshops

What Will Happen At This Event?



The purpose of this planning workshop is to convene key urban air pollution stakeholders to **reach a joint agreement** on initiatives and actions to air pollution for their city.

The workshop objectives are to:

- **Validate** baseline data and scientific evidence
- **Define** key themes and interventions
- **Identify** and prioritise actions and instruments

The expected workshop outcomes:

- **Understanding** of sources, pathways and possible hotspots
- **Enhanced knowledge** of how to mitigate air pollution
- Increased **capacity to act on effective policies** and activities that reduce emissions, concentrations and exposure
- A better understanding of the **city's role** in national/regional **advocacy efforts**

City Action Planning

What Is A City Action Plan?

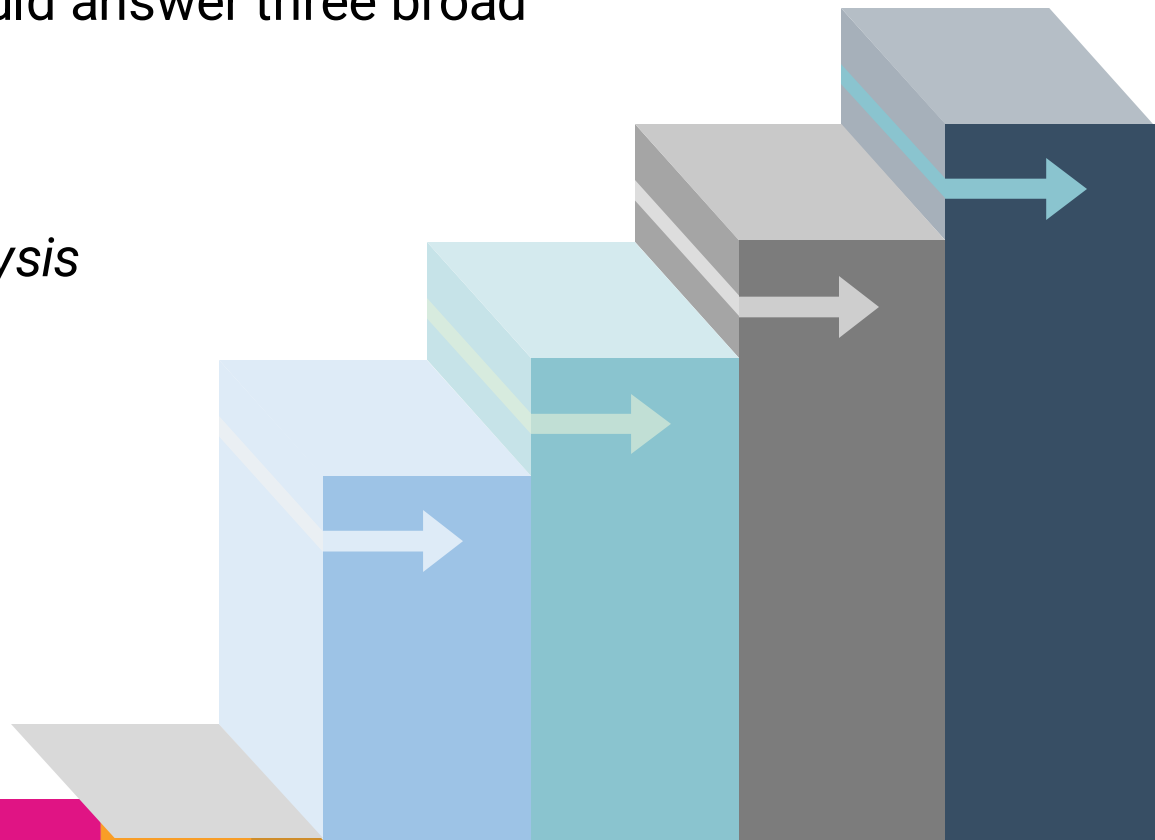
A city action plan is a policy instrument that **establishes specific goals** and details what steps must be taken in order to achieve each goal.

The process of achieving a robust City Action Plan should answer three broad questions:

1. What is the current situation?
   The science/evidence through a baseline and gap analysis

2. What can we do about it?
   Intervention Planning

3. How do we implement it?
   Action





Science-based Measures

What Types Of Policy?

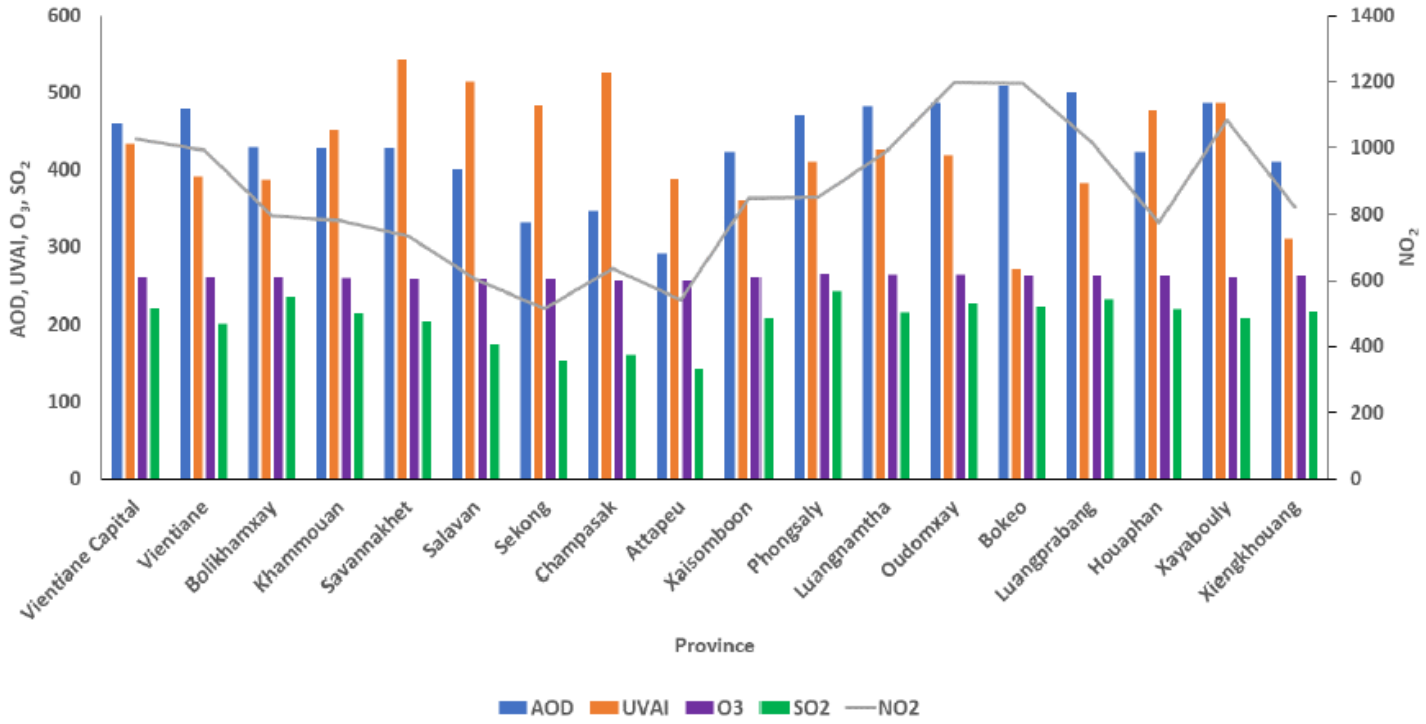
A 2019 UNEP/CCAC report identified 25 proven and cost-effective measures - that if implemented, could give one billion people living in Asia access to clean air by 2030.

The policy recommendations represent the framework of what our project is trying achieve throughout the region- identifying the most appropriate solutions for cities based on their context.

Lao PDR
Air Pollution Action

Robust Analysis Already Available

Figure 10: Study period means of each province for aerosol optical depth and the ultraviolet aerosol index; and column amounts of ozone, nitrogen dioxide and sulphur dioxide. Note that the pollution indicator values were normalised to fit onto the same graph

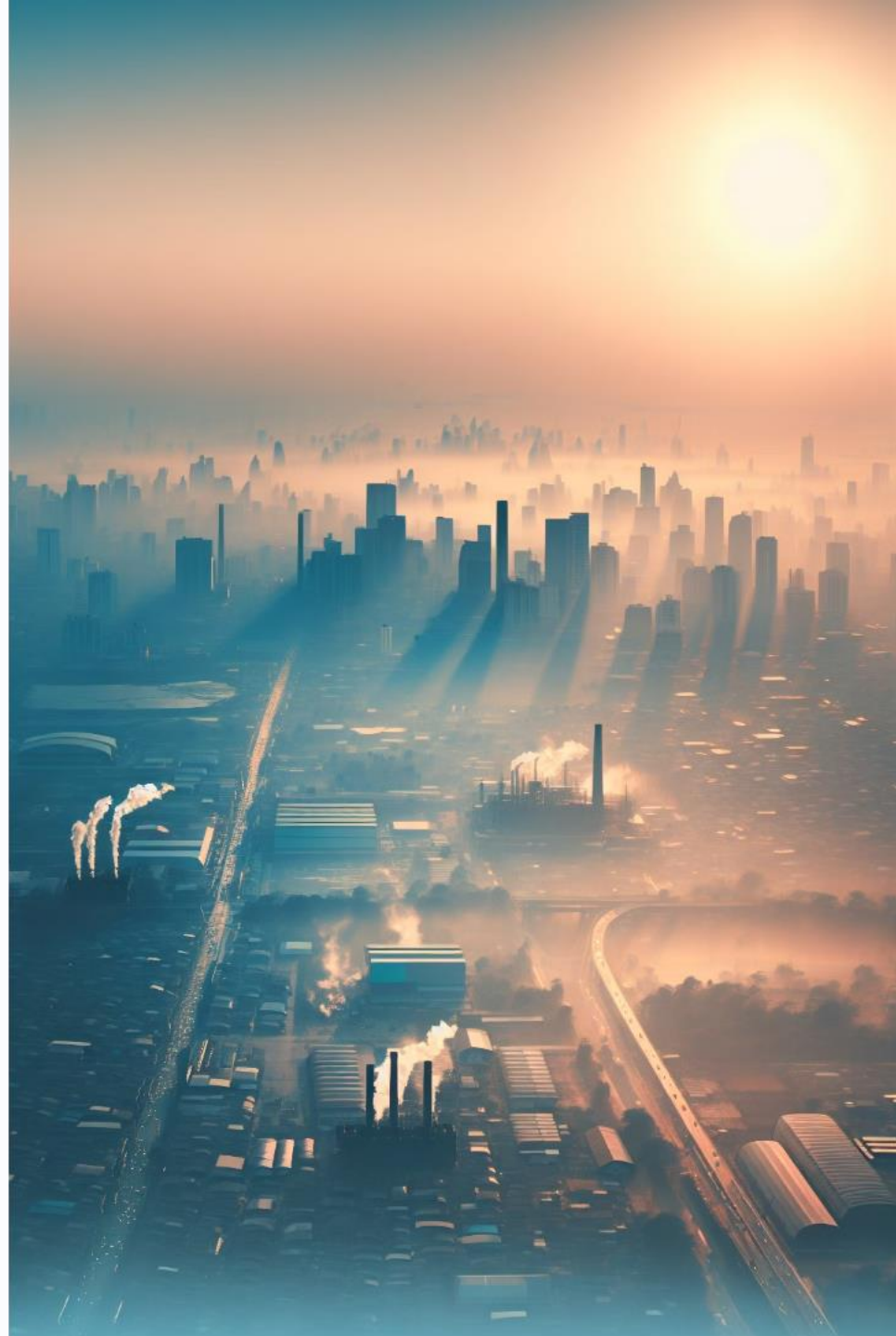




2023

Major Sources of Air Pollution in Lao PDR

Air pollution in Lao PDR is a significant concern, with various sources contributing to poor air quality. This presentation will explore the major sources of air pollution in the country, including household air pollution, tobacco smoke, agricultural and forest fires, industrial and vehicle emissions, and charcoal combustion from street food vending.



Household Air Pollution

1 Predominant Source

Household air pollution (HAP) is a predominant source of air pollution in Lao PDR, primarily due to the use of solid fuels for cooking and heating.

2 Biomass Fuel Use

Studies indicate a high prevalence of exposure to pollutants from cooking fires, with 78% of households using biomass fuels such as wood, charcoal, crop waste, and dung.

3 Indoor Air Quality

This form of pollution is particularly concerning because it directly affects indoor air quality and exposes residents to high levels of particulate matter and other harmful pollutants.

Tobacco Smoke

Secondhand Smoke

Exposure to secondhand tobacco smoke (SHS) in homes is another significant contributor to indoor air pollution. The National Adult Tobacco Survey of Lao PDR reported that 74.5% of adults are exposed to SHS at home.

Smoked Tobacco

The prevalent use of smoked tobacco has been linked to increased rates of tuberculosis in the region.

Agricultural and Forest Fires

1

Smoke Emissions

Outdoor air pollution in Lao PDR is significantly influenced by smoke from agricultural practices and forest fires.

2

Particulate Matter

These activities contribute to elevated levels of particulate matter and other pollutants in the atmosphere.

3

Key Source Sector

The emission inventory for Lao PDR highlighted forest fires as a key source sector for air pollutants, including particulate matter (PM2.5) and black carbon.



Industrial and Vehicle Emissions

Source	Pollutants
Industrial Sector	Nitrogen oxides (NOx), sulfur dioxide (SO2), non-methane volatile organic compounds (NMVOCs)
Vehicular Traffic	Nitrogen oxides (NOx), sulfur dioxide (SO2), non-methane volatile organic compounds (NMVOCs)
Fuel Consumption	Particulate matter (PM2.5)

With rapid economic development, there has been a significant increase in fuel consumption, vehicle fleet, industrial output, and waste generation. These factors contribute to national average ambient PM2.5 levels that are four times higher than World Health Organisation guidelines.

Charcoal Combustion from Street Food Vending

PM2.5 Emissions

The popularity of street food in urban areas, particularly in Vientiane Capital, has led to significant emissions from charcoal combustion. This activity contributes to PM2.5 levels.

Health Risks

This activity poses health risks to the workers involved, who are predominantly female and work long hours in conditions of high pollutant exposure.



Conclusion

1

Traditional Sources

The air pollution landscape in Lao PDR is characterized by a mix of traditional pollution sources, such as household air pollution from solid fuel use and tobacco smoke, as well as agricultural and forest fires.

2

Modern Sources

Modern pollution sources, including emissions from industrial activities and vehicles, also contribute significantly to air pollution in the country.

3

Integrated Policies

Transboundary Pollution Opportunities.

- Air mass trajectories travel from Thailand, Myanmar, and even Bangladesh within 48 hrs to Bokeo during the fire season of 2021. Biomass burning frequency is high in these countries around March. Sirimongkonlertkun (2018) identified March as the peak month for fire hotspots in Thailand, the Lao People's Democratic Republic and Myanmar between 2014–2016, with the latter exhibiting the highest number of hotspots.
- Finally, this work demonstrated that the Lao People's Democratic Republic is likely to be experiencing transboundary pollution from its neighbouring countries, particularly during the corresponding burning seasons.
- In December 2020, government officials in Thailand held a meeting with Cambodia, Myanmar and the Lao People's Democratic Republic to discuss how the transboundary pollution that was predicted to occur in the following year within the Mekong Subregion could be reduced.
- Strategies included the **implementation of technology to forecast air quality in advance**, the use of **satellite imagery to monitor air pollution**, and the **development of a system to detect forest fires**. It was also encouraged to replace burning with **fuel reduction and utilization** prior to the potential haze episode.
- The governments in the region are encouraged to continue working collaboratively for the monitoring and reduction of emissions.

What does this mean for Lao PDR?



Phase 1
(June 2024 -Sept 2024)

~30,000k USD For Remote Sensing at the National Level

- Training
- Procurement of equipment
- Integration of satellite data into national systems



Implementation Support (Oct 2024-Dec 2026)

~30,000k USD for direct support to beneficiary cities

- Enhancing sustainable agriculture
- Protecting Vulnerable Populations
- Coordinating with Neighbors



Next Steps

- Prepare Draft Studies
- Coordinate with Cities and local stakeholders
- Virtual Project Inception Meeting (End of May)
- Letter of Agreement and Transfer of Funds

QUESTION AND ANSWER

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