

GEO-6 FOR INDUSTRY IN ASIA-PACIFIC

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FOREWORD

Asia and the Pacific's unrelenting industrial development has been a driving force in the economic growth of scores of countries in the region and beyond. This shift has led to greater prosperity, increased urbanisation and sustained population growth.

Yet as the region has become the "world's factory", it is increasingly realising not only the benefits but the challenges of industrial development. These challenges are often environmental in nature.

The 6th Global Environment Outlook, released earlier this year, showed us that sustainable development was at risk from a number of factors. Not least of these were unsustainable consumption and production patterns and large increases in resource use. This report, a special product of GEO-6, further examines how these environmental problems are caused - and can be addressed - by the region's rapid industrialisation.

A healthy environment and resilient ecosystems are the foundations of economic prosperity, human health and well-being. Currently, however, industrial use of natural resources is unsustainable and inefficient. Industrial pollution is a driver of climate change, biodiversity loss, and all of their attendant drawbacks.

The good news is that many countries in the region have recognised core problems and are moving forward in regulating industry, controlling industrial pollution and stemming wasteful resource use. But as with many environmental challenges, we must scale up our efforts and move much faster. And there is more to uncover than the marquee environmental problems. Less well-known but just as significant are emerging issues such as pharmaceutical pollution, overuse of antibiotics, microplastics, genetic modification and nanotechnology. The region's policy makers must be alert to these emerging challenges and the different policy implications they bring.

This report has brought together the region's foremost environmental policy think tanks to both identify the challenges and help point the way forward. I hope that this analysis highlights the importance of continued research into the environmental impact of the region's industrialisation. And I hope its conclusions will enhance the innovative approaches, policies and practices, often pioneered by countries in Asia and the Pacific, that will be vital to achieving the Sustainable Development Goals.

Dechen Tsering

Regional Director UN Environment Regional Office for Asia and the Pacific

INTRODUCTION

A core mandate of the United Nations Environment Programme (UNEP) in Asia and the Pacific is to keep the region's environment under review as outlined below.

- Global Environment Outlook (GEO) Asia and the Pacific: an integrated assessment conducted every 5 years in the region to report on the regional environmental situation, and to provide content for the global GEO assessment.
- Environment Live: an open on-line platform for sharing environmental data and other knowledge products; and supporting assessment and research.
- GEAS Alerts: short reports on environmental change, as they occur in locations in the region, and on emerging issues and threats in the region requiring urgent attention.
- Thematic assessments: conducted at regional and sub-regional levels to support government decision-making to address critical or emerging environmental issues in the region.
- Capacity-building in state of environment (SoE) and other environmental reporting, for example the Sustainable Development Goals (SDGs) and multilateral environmental agreements (MEAs) in the region.
- Facilitate implementation of other global programmes, for example the development of statistical methodologies for SDG indicators and Global Environmental Monitoring System (GEMS)/Water in the region.
- Science policy interface and policy impacts of different options.

The Asia-Pacific regional assessment for GEO-6, released in 2016, identified the region's rapid urbanisation and industrialisation as key drivers of environmental change affecting air, water, land and biota to varying degrees. The identified emerging issues have had less attention from policy makers to date and may be having silent impacts that will only be recognised when it is too late to prevent or avoid them. This brief e-report takes a deep dive into the sub-

ject of the impact of Asia-Pacific's rapid industrialisation on the region's environment, not just from the usual perspective of historical trends and known environmental impacts but also through a closer examination of emerging environmental issues of concern.

The first section of the report deals with the traditional state and trends examination that is expected in a GEO report, covering the impacts of industrialisation on climate change, air, water and biodiversity, but with a greater emphasis on emerging issues rather than historical trends. Industrialisation is treated sufficiently broadly to cover not only the manufacturing and energy sectors but also intensive agriculture, such as pig and poultry farming that have major impacts on the environment.

The chapter on climate change (Chapter 1) focuses on industrial energy efficiency as a critical pathway to reducing greenhouse gas emissions. Much of the current debate around climate change centres around mitigation through the promotion of renewable energy, whereas energy efficiency may be a low-hanging fruit for industry, with quick pay-back returns.

The chapter on air quality (Chapter 2) discusses the recent re-emergence of air pollution concerns. It also suggests that policymakers in the region will need to target multiple pollutants and multiple sources to address these concerns. This includes several sources that are not considered major contributors to air pollution such as waste and manure management. This chapter investigates whether the arrangements that are in place in Asia and the Pacific are adequate to address these pollutants or if are they being allowed to pass below the radar.

The twin issues of water scarcity and water quality are addressed in Chapter 3, with particular attention to groundwater depletion, emerging interest in fracking, industrial contamination of surface and groundwater, nutrient pollution from intensive agriculture and aquaculture, and low concentration contaminants that often escape wastewater treatment and ambient monitoring programmes. Different policy options for closing the gap between established measures and expected national targets on water quality and quantity are examined.

Chapter 4 examines how industrialisation contributes directly and indirectly to the loss of biodiversity – directly through the demand for resources from biodiverse regions and indirectly through emerging outputs of the industrial system such as genetically modified organisms. The use of clustered regularly interspaced short palindromic repeats (CRISPR) as a tool to manipulate DNA and the potential for the release of genetically enhanced food and animal products is addressed as a double-edged sword, having both the potential for great benefits and harm. The social and environmental impacts of these "enhanced" species and the need for new policy responses are examined as potential "sleeping" issues in the Asia-Pacific region.

The second section of the report addresses some emerging pollutants from industry that need to be addressed in the immediate future. While these may currently not be the highest priority issues, they have potential to become major problems that will be quite difficult to solve. It is therefore important for policy makers to be aware of these emerging issues and make the necessary preparations for dealing with them before they develop into major environmental challenges.

Chapter 5 on electronic waste deals with a higher profile issue,

environments and the possibility that these tiny plastic particles could transfer toxic chemicals to fish and other aquatic organisms and ultimately to humans. The related issue of nanomaterials is also addressed briefly in this chapter, along with recommended policy options.

The final technical chapter (Chapter 7) examines the emerging environmental problems associated with pharmaceuticals, antibiotics and personal care products that are being detected in low concentrations in aquatic environments and drinking water, and can have adverse impacts on biota and potentially on human health. The excessive use of antibiotics in livestock animals and the potential transfer of antibiotic-resistant bacteria to humans is also highlighted, with policy options for their use and disposal discussed.

Chapter 8 discusses the research, policy, and regulatory implications of these emerging environmental issues, with the objective of making policy makers in the Asia-Pacific region more aware of these looming threats and preparing them for taking precautionary actions.

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