

AN ATMOSPHERE OF DISCOVERY

NEW SUSTAINABLE DEVELOPMENT PATHS ARE A BREATH OF FRESH AIR

Balancing rapid economic growth and environmental protection is a central strategy for China, and essential for sustainable development. As a pioneer in ecology and environmental science research and education, Peking University (PKU) has set out to meet major national environmental challenges, through interdisciplinary work on: air, water and soil protection; climate change and ecological response; and conservation of biodiversity.

PKU's academic strengths are demonstrated by commanding positions in various university rankings. For example, according to the Essential Science Indicators (ESI), PKU is ranked among the global top 0.2% in ecology/environment. The latest subject rankings at US News and QS listed PKU at 44th and 26th respectively in environmental sciences among world universities.

The cutting-edge research at PKU underpins China's growing role in solving environmental issues. In response to climate change, a PKU research team has established a global high-resolution pollutant emission inventory. Their mapping suggests that China accounts for about 10% of the increase in radiative forcing, a measurement of the different influences on climate change, since before industrialization. Systematic exploration of climate feedback and its underlying mechanisms has illustrated the role of terrestrial ecosystems in climate change. PKU researchers have also proposed methods to estimate carbon storage in various ecosystems, shedding light on potential

approaches to maintain carbon balance in ecosystems in China and around the world. Their breakthroughs are published in *Nature* and other leading journals, which has contributed to PKU's prominence in environmental sciences internationally.

There are grave concerns about the impact of China's air pollution on human health. Through extensive epidemiological and toxicological studies, PKU researchers have disclosed key mechanisms of the damage to health caused by pollution particles known as PM_{2.5}. They have also identified the ecotoxicological effects of key health hazards such as environmental endocrine disruptors (which interfere with hormone systems), including persistent organic pollutants (POPs).

Recognizing the myriad pollution hazards faced by China, PKU is the first in the world to propose the theory of combined air pollution and river material fluxes. It has also made theoretical innovations in atmospheric oxidation, new particle burst and biodiversity conservation. Its studies linking environmental pollution with socioeconomic development reveal that urbanization-induced population migration has reduced ambient PM_{2.5} concentrations in China.

Improving the environment through technological innovation is at the core of many of PKU efforts. For example, scientists have constructed a systematic framework for joint control of regional air pollution, integrated monitoring, pollutant inventory, forecast modelling and comprehensive decision-making. Their work has led to success in controlling PM_{2.5} in the China's Pearl River

delta region and aided in the planning and implementation of controls to prevent air pollution in major regions of China.

Novel pollutant removal technologies and watershed management models developed by PKU researchers have been used for comprehensive control of large rivers and lakes nationally.

Following a long PKU tradition of supporting social progress and sound policy-making, environmental scientists at PKU have contributed to decisions for global environmental treaties and domestic environmental policies, based on results from their multi-disciplinary studies.

Illustrating this contribution, PKU led the first Country Programme for Phasing out Ozone Depleting Substances under the Montreal Protocol (MP), winning international recognition for its proposals. It has also taken part in drafting a number of United Nations Intergovernmental Panel on Climate Change reports.

Locally, PKU has made policy recommendations to the central government on urbanization and land management. Faculty members have contributed to policy advice on energy conservation, environment and resource management, urban and rural development, natural conservation and ecology, which will aid in the sustainable development of the country.

PKU is also dedicated to fostering the next-generation of leaders in ecology and environmental sciences, particularly those with a solid knowledge base, an international perspective and the capacity for innovation. ■