

Food Safety and Health Issues in China as a Result of Soil and Water Pollution

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Perspective

China's per capita arable land area is less than half that of the rest of the world, and its per capita arable water is around a quarter of that of the rest of the world. As a result, the country can no longer afford to lose any more usable land or water as a result of rising pollution levels. Environmental policymakers have always evaluated soil and water contamination separately. However, for the preservation of agricultural productivity and human health, coordinated policies addressing both soil and water contamination must be developed. Water availability is critical for agriculture, since it assures long-term grain productivity increases.

The most serious threat to China's food production may be an impending water shortage caused by highly unequal distribution of surface water resources, as well as rising demands from irrigation, population growth, and rapid urbanisation. Furthermore, substantial surface water contamination in China not only exacerbates the possibility of a water deficit, but also degrades grain quality. The majority of research papers to date have focused on the connections between crop yield and water resources, water use efficiency, infrastructure, agricultural management, and climate change, while only a few studies have looked at the effects of surface water pollution on grain quality at a national level.

There are clear consequences for managing existing water resources sustainably, comprehending the nature and scale of demands, identifying the elements that impact water quality, and devising policies to assure continuous agricultural output development. Since the 1950s, pesticides have played a critical part in the success of contemporary food production. Numerous studies have shown that the usage of fertiliser and pesticides has considerably aided grain output.

Inefficient pesticide usage, on the other hand, can pose serious human health hazards. Inadequate pesticide application management in food production poses a danger of occupational hazards for farmers as well as environmental threats to agricultural ecosystems. Pesticide residues in grain can have a direct impact on public health through food intake, and diet-

related illnesses can have a detrimental impact on public health. The World Health Organization estimated that pesticide poisoning caused by unintended occupational exposure has resulted in several million cases globally, demonstrating that pesticides have a significant impact on many areas of human health (WHO, 1990).

Although modern pesticide usage provides a lower risk to the environment and individuals than in the past, the negative consequences are still a substantial and long-term worry. Heavy metals, out of all the contaminants recorded, are thought to pose the biggest threat to food safety in China. Mining and smelting, sewage irrigation, sludge reuse, and fertiliser application are the primary sources of heavy metals in agriculture soils. Large amounts of heavy metals affect farmland through wastewater irrigation, waste transportation, sludge application, and atmospheric deposition as a result of some mining and smelting enterprises' extensive and nonstandard production processes, which has been shown to be particularly important in southern China with abundant mineral resources.

Since the 1950s, China has used extensive irrigation using badly treated sewage water, with the impacted area expanding from 115 km² in 1957 to 36,000 km² in 1998, and staying over 30,000 km² since then. Sewage irrigation is the use of sewage output for irrigation without any treatment or with only the solids removed, which is often contaminated with poisonous and dangerous compounds. Untreated sewage from small cities has been put directly to farm fields in some regions.

According to an official survey conducted in the 1980s, 86 percent of the area receiving sewage irrigation did not meet irrigation water quality standards, and 65 percent of the sewage irrigation area was contaminated by heavy metals, with mercury, lead, and cadmium being the most serious heavy metal pollutants. According to a recent official nationwide survey, Cd, arsenic (As), and polycyclic aromatic hydrocarbons were found in 39 of 55 sewage irrigation areas. Heavy metals are accumulating at an alarming rate, particularly in farmlands with intensive agriculture and big irrigation systems. Meanwhile, as the animal husbandry business expands, waste products from intensive livestock production, which include high concentrations of as, zinc, and copper, are becoming key pollution sources.

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