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GLOBAL
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CASE STUDY

LAGOS: GROWTH WITHOUT INFRASTRUCTURE

Lagos, the former political and current commercial capital of Nigeria, began to expand at a breakneck pace with the oil boom of the 1970s. This coastal city of nearly 10 million people now serves as the transportation hub for greater West Africa. Annual growth rates exceeding 3% through 2015 will vault Lagos onto the list of the world's 15 largest cities by 2025, with a projected population of almost 16 million people. A re-emerging middle class of older professionals and younger digital natives enjoys rising living standards, but beyond the skyscrapers and luxury condos sprawls an unplanned city coaxed from shifting coastal soils. Two-thirds of the population of Lagos lives in slum neighborhoods, many built on fills or perched on stilts over open water – communities that are dynamic solutions to housing pressures and sources of environmental health risks.^{1, 2}

Despite its key role as home to about 60% of Nigeria's non-oil economy, the city's annual operating budget of approximately \$US 650 million significantly lags behind spending by comparably sized cities such as Delhi, Mumbai, and Jakarta. Bureaucratic red tape, lack of financing and skyrocketing housing prices pushed home ownership out of the reach of even the middle classes. Subsidence-prone soils make safe construction more expensive than in other large cities. The majority of urban migrants resort to densely crowded informal settlements, often on environmentally precarious land. In 2007, the population density of Lagos averaged 18,150 people per square kilometer, trailing only Mumbai, Kolkata, and Karachi. Despite commitments by the World Bank to support urban development and renewal, and routinely revised master plans for regional growth, municipal authorities in Lagos face a constant race between resources and needs.^{3, 4}

Despite investments and reforms, Lagos still lacks adequate treatment capacities to deliver enough clean water for drinking and household use. By the end of 2008, vigorous efforts by the state water authority achieved a water delivery capacity of 200 million gallons per day (mgd) against a demand of 600 mgd, a gap of about 66%. Intermittent electrical failures prevent existing treatment plants from operating at their design capacity. The Lagos Water Corporation (which spans 20 independently administered local government areas in the conurbation) rarely collects adequate revenues for the water it does deliver, eroding capital and maintenance budgets. Households turn to private wells or street vendors to meet drinking water needs, creating a thriving market for "sachet water," commercially purified water packaged in polyethylene pouches. Sachet water frequently exposes consumers to bacterial and heavy metal contamination

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exceeding local regulatory standards. The plastic packages themselves (pictured right) choke waterways and drainage systems. Perceptions of water safety and purification at the point of use echo findings elsewhere: households tend to be more concerned with the appearance and taste of water than the invisible load of microorganisms. The number of cases of waterborne diseases such as cholera and dysentery reported annually in Lagos has increased over the past two decades.^{5, 6, 7, 8, 9, 10}



Despite its relative wealth, the sewage and solid waste management systems in Lagos strongly resemble those of Kinshasa and Nairobi: essentially absent. A 2006 report estimated that less than 1% of households in Lagos were linked to any closed sewerage system. Outside of elite enclaves, residents rely on pits and open sewers, or dispose of human wastes and garbage directly into surface waters. Waste collection depends primarily on private sector manual labor, including organized concessions that actively undermine municipal sanitation development.¹¹

More than 10% of the estimated 4,000-6000 tons of solid wastes generated each day in Lagos are dumped directly into open spaces or municipal drainage systems, blocking drainage during heavy rains. Flooding during the rainy season routinely submerges residential areas in inches to feet of water, inundating households with sewage and garbage. In 2006, 43% of Lagos residents reported flooding of their homes. This problem will only increase with the rising sea levels predicted to accompany climate change.¹²

Most transportation in Lagos depends on the city's highly congested roads. Lagos accounts for about 40% of new vehicle registrations in Nigeria. As private cars, buses, and two-stroke-engine motorcycles proliferate, road traffic injuries and pollution climb. An estimated 4 million injuries and 200,000 deaths due to road traffic crashes occur each year throughout Nigeria, contributing to Africa's road injury mortality rate of 28.3 per 100,000 population – the highest among all geographic regions, and almost three times the rate in Europe.^{13, 14} The pollution from traffic commingles with emissions from industrial estates and “flaring” (the burning of solution gases trapped in oil during petroleum refinement), domestic burning of kerosene and solid fuels, and incineration of solid wastes. Air sampling from 2001-2006 led to an estimated annual mean ambient air particulate concentration of $122\mu\text{g}/\text{m}^3$ for Lagos, about 500% higher than the $20\mu\text{g}/\text{m}^3$ threshold established by WHO. The concentration of particulates climbed even higher in densely populated residential areas. WHO estimated in 2007 that outdoor pollution throughout urban Nigeria caused about 14,700 deaths annually.^{15, 16, 17, 18}



Weak governance compounds the problems already presented by city's fragile ecosystems and shifting soils. Due to corruption in the construction industry, new buildings regularly collapse in some neighborhoods, killing dozens at a time. Low-income neighborhoods are notoriously plagued by violent crimes. Acts of vandalism to pipelines that carry oil through residential

neighborhoods, often attempts to steal fuel, have caused pipeline disasters that killed hundreds in Lagos between 2004 and 2008.¹⁹

Since the end of military rule, Nigeria's leaders have lent high-level support to health initiatives, from coping with the HIV/AIDS epidemic to strengthening badly fragmented health systems. Nigeria has received hundreds of millions of dollars in health assistance annually from the World Bank, the Global Fund, the U.S. government (primarily through PEPFAR), and other bilateral donors. These partnerships fund badly needed services, from HIV testing and treatment to intensive vaccination campaigns. However, even major infusions of political and financial capital into health services cannot, in isolation, compensate for environmental health risks born of Lagos' built and rapidly deteriorating natural environment.

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