

JUNGLE CLIMATE IN BRAZILIAN MEGACITY

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São Paulo, one of the biggest urban centers in the world, has shot upward and outward so intensely in the last 30 years that even the climate is chaotic, not to speak of the traffic. The megacity now has only 3.5 square meters of vegetation per inhabitant, according to City Hall, whereas the World Health Organization (WHO) recommends 12 square meters per inhabitant.

With over 11 million inhabitants, São Paulo ranks lower in the global league of megacities than New York, Mexico City and Tokyo, but it may well have worse problems with pollution and unstable weather than any of them. Proliferating high-rise buildings, multi-lane expressways and paved yards instead of gardens have so increased the total area of heat-reflecting glass, concrete, steel, and tarmac natural climactic laws no longer apply.

"The urbanization process has created an artificial desert here," said Magda Lombardo, a geographer at the University of São Paulo. There are major swings in temperature during a single day, and thermometers often record strikingly different temperatures at the same time in different districts only a few kilometers apart. These "islands of heat," are comparable to the global "greenhouse effect," Lombardo explained.

Take the example of a typical working-class commuter, Simão Matias Delmondes, a 67-year-old watchman who lives in Grajau, in the southern outskirts of the city. Every day he takes two buses to travel west to Sumaré, the affluent neighborhood where he works. In the middle of the year, the early morning is cool, so he wraps up in warm clothes. "By midday, however, the heat becomes oppressive, and he is obliged to strip down, feeling like all four seasons have been rolled into one," said Lombardo.

Lombardo, whose current research project deals with microclimates in São Paulo, said there are often differences as great as 10° Centigrade between one district and another, at the same time of day. In this 1,493 square-kilometer city, the outlying areas are relatively far away from downtown, where most of the high-rise buildings are concentrated. But Ibirapuera Park, with 1.8 million square meters of grass and trees, can be five degrees cooler than the nearby business district on Avenida Paulista, lined with skyscrapers, and abuzz with exhaust-belching traffic.

Heavy industry is another cause of climate instability. According to Lombardo, islands of heat are also found in São Bernardo do Campo, Santo André, and São Caetano do Sul - large suburbs of the metropolitan area to the south of São Paulo, containing many

large car factories, petrochemical plants, and other heavy industrial facilities.

The contrasts are more acute in the midyear Southeastern Brazilian winter. This is a season of clear skies, relative humidity, and little wind. In residential areas, the day begins cool at this time of year, but as soon as the sun is high in the sky, temperatures rise to summer levels, and the characteristics of this tropical season are intensified to storm levels by the irregular São Paulo climate, causing catastrophic floods.

Washed out - This year, the city became awash with stormwater throughout the summer season. In the first four months of 1991 rainfall totalled 1,253 millimeters, compared to a normal 12-month total of 1,432 millimeters. In March, rainfall was the highest in 40 years, at 489 millimeters, three times the expected amount.

The entire city ground came to a halt twice because of flooding. On March 5, the two main rivers that cross the central districts, the Tietê and the Pinheiros, both burst their banks. Rainfall was 183 millimeters on that day alone, the worst of any day in March for 19 years. Two weeks later, during another cloudburst (71 mm), the rivers again overflowed and submerged the busy multi-lane expressways that run along their banks. In the ensuing chaos, many people were trapped inside stranded vehicles for up to ten hours. Five people died as a direct result of the flood.

Fogbound - Thirty years ago, São Paulo was affectionately known as "the land of drizzle." Rufino Lajusticia, a Spanish born pensioner who has lived in the city for 50 of his 75 years, recalls those days with nostalgia. "It was a smaller, less hectic place, unlike it is now," he said, "There's never any drizzle, it's too hot, and you live in fear of flooding," he said of the city today.

For Silvio de Oliveira, a meteorologist with CETESB, the São Paulo State environmental agency, the proper nickname for the city today would be "the land of fog." With less vegetation and hence lower humidity, he explains, fog (and indeed smog) is caused by the moist sea winds that blow up from the coast. São Paulo lies about 80 kilometers inland, and 760 meters above sea level. The southeasterly winds condense in the hot airstream rising from the concrete jungle, together with the smoke and pollution, to form a dense bank of smog.

Lombardo believes that the solution to all these weather problems must be ecological. "We need modern urban planning legislation, and above all we must have more greenery," she stressed.

City Hall takes action - Coincidence or not, the municipal authorities are about to take action along precisely the lines Lombardo advocates. Based on a survey conducted by environmentalists and university researchers, City Hall has picked the districts where pollution and other environmental problems cause the worst climate instability. The city's parks department has begun a massive tree-planting campaign with a budget of about \$322,000 dollars. According to Antonio Edson Ferrão, director of the department, around 200,00 seedlings will be planted in different parts of the city. "That would be sufficient to

create a new park with an area of 60,000 square meters," he noted.

This kind of program is just what the megacity needs to help it fight of the effects of pollution and urban chaos. But it is only a modest beginning: Ferrão quite candidly admitted that the effects of the newly-created green areas will not be felt for another four years, at least, when the seedlings begin to reach maturity.

Error: in last week's feature story an error in translation named the "manatee" "sea cow." The editors apologize for the mistake.