# Pollution, our Planet, and the Poor: There is no Planet B

*Science Policy Brief*

Dixie Valle

**Part 1: Scientific Analysis**

**Introduction Analysis**

Climate change is a rising issue in the United States as scientists predict the detrimental effects that will soon be faced, if climate change is not acted upon. According to multiple case studies by renowned colleges and scientists, like Yale, a significant factor contributing to climate change is air pollution which disproportionately affects low income communities and results in adverse health effects. This is due to the geographical location, history, and lack of capital of low income communities. This paper will address air pollution inequity by exploring policies that allocate funds to low income communities through urban greening, making these services accessible and affordable.

Low income communities that have less funds to invest into "innovative services and urban greening," both which help reduce pollution.[1]Additionally, low income communities are located in industrial areas and road thoroughfares. Low income communities are more exposed to unhealthy air which leads to adverse health effects. African Americans suffer the most from unhealthy air quality because statistically they usually live in low income neighborhoods due to historical effects of slavery, redlining, and white flight. [2]A study was done which found that "Mean pollutant levels tended to be higher in lower-income neighbourhoods."[3] While pollution is an issue that affects our whole nation it is important to recognize the disproportionate harm to low income communities. This issue does not just affect a few low income communities but

---

[1] Pyzyk, K. (2018, December 04). Study: Low-income neighborhoods disproportionately feel environmental burdens. Retrieved February 12, 2021, from https://www.smartcitiesdive.com/news/study-low-income-neighborhoods-disproportionately-feel-environmental-burde/543498/

[2] Ash, Michael, and T. Robert Fetter. "Who lives on the wrong side of the environmental tracks? Evidence from the EPA's risk‐screening environmental indicators model." *Social Science Quarterly* 85.2 (2004): 441-462.

[3] Finkelstein, Murray M., et al. "Relation between income, air pollution and mortality: a cohort study." *Cmaj* 169.5 (2003): 397-402.

almost all low income communities throughout the United States. Research was found using data from all 50 states that “emissions per capita decrease with increasing per capita income for all seven major classes of air pollutants”.[4] Low income community members experience helplessness regarding this issue because of their lack of monetary agency to move to other places with healthier air quality. Our constitution promises “life, liberty, and the pursuit of happiness” in which we are not complying with if we choose to ignore this known fact of unhealthy air quality being more common in low income neighborhoods.

This paper will attempt to find a solution to reduce pollution in low income communities, “environment-health-poverty-traps,” in order for working class members to have a healthy life.[5] This will be navigated through researching economic investments for urban greening in low income communities, examining location and where there are healthier cities, and researching the history of environmental disparities on under resourced communities.

**Pollution and the long lasting effects of Redlining**

Redlining was a behavior practiced in the 1930’s until the 1960’s. Redlining refers to “banks in the U.S. denied mortgages to people, mostly people of color in urban areas, preventing them from buying a home in certain neighborhoods or getting a loan to renovate their house”.[6] This resulted in policy enforced segregation, in which segregated towns and cities are still prevalent today. This is because of the long lasting effects redlining had;it created damage and

---

[4] Carson, Richard T., Yongil Jeon, and Donald R. McCubbin. "The relationship between air pollution emissions and income: US data." *Environment and Development Economics* (1997): 433-450.
[5] Yang, Tingru, and Wenling Liu. "Does air pollution affect public health and health inequality? Empirical evidence from China." *Journal of Cleaner Production* 203 (2018): 43-52.
[6] Brooks, Khristopher J. “Redlining's Legacy: Maps Are Gone, but the Problem Hasn't Disappeared.” *CBS News*, CBS Interactive, 12 June 2020, www.cbsnews.com/news/redlining-what-is-history-mike-bloomberg-comments/.

segregation, that the government never addressed. Additionally, it added to the wealth gap between people of color and White people, which is why most of these low income communities are demographically people of color.

Asthma is one of the most common adverse health effects from redlining. A case study was done to outline the relationship and effects of redlining and asthma. This case examined eight cities: Fresno, Los Angeles, Oakland, Sacramento, San Diego, San Jose, San Francisco, and Stockton. All these cities experienced redlining to a different extent. The case found that "historically redlined census tracts have significantly higher rates of emergency department visits due to asthma, suggesting that this discriminatory practice might be contributing to racial and ethnic asthma health disparities."[7] While this study does not focus on air pollution, it does establish that there is a correlation and relationship between redlining and its effects and community members of these very same areas having a higher possibility of getting asthma. There are many factors to developing asthma, air pollution being one. Air pollution contributes to the higher chance of underprivileged communities getting asthma. Redlining has not only historical implications but health effects decades after causing people of color in these neighborhoods, cities, and areas to be more vulnerable.

**A. Surroundings of Low Income Communities**

As mentioned before, low income communities tend to be located in industrial areas and road thoroughfares. This is not just a mere coincidence, but a pattern among under-resourced communities throughout America. This contributes to the disproportionate air pollution of low income communities. Low income communities have more proximity to pollution sources. It was

[7] Brooks, Khristopher J. "Redlining's Legacy: Maps Are Gone, but the Problem Hasn't Disappeared." *CBS News*, CBS Interactive, 12 June 2020, www.cbsnews.com/news/redlining-what-is-history-mike-bloomberg-comments/.

found, “that in the urban United States as a whole, block groups with more African Americans have higher levels of exposure to toxic pollution from TRI facilities … we find that within these cities, Hispanics, as well as African Americans, tend to live in more polluted areas.”[8] TRI facilities refers to toxic release inventory facilities in which people of color tend to live in close proximity to. This study establishes that there is a correlation between low income communities, which tend to be made up of Hispanics and African Americans, and more air pollution within these communities. This is because of the location as mentioned. Low income communities have highways near them which produce a lot of air pollution since a large amount of cars travel through there. Additionally, they are located near or in industrial areas because low income community members tend to work in these areas. These areas are the most vulnerable to industrial areas being built in because of the lack of awareness and agency to turn down industrial companies being built in these neighborhoods/communities.

**Health Risks**

The conversation of change on pollution reduction on low income communities is not to exclude high income communities that also suffer from pollution. Pollution is inevitable to experience; however, low income communities are experiencing it at an accelerated rate which results in detrimental health effects. Detrimental health effects include “diabetes mellitus,

[8] Ash, Michael, and T. Robert Fetter. "Who lives on the wrong side of the environmental tracks? Evidence from the EPA's risk‐screening environmental indicators model." *Social Science Quarterly* 85.2 (2004): 441-462.

hypertension, heart failure, and chronic obstructive pulmonary diseases".[9] The distribution of power affects the air quality from place to place in America.[10]

These health effects "accounts for an estimated 4.2 million deaths per year due to stroke, heart disease, lung cancer and chronic respiratory diseases".[11] These statistics account for worldwide deaths. The Asthma and Allergy Foundation (AAF) has reported that "more than 4 in 10 Americans live in areas where air pollution levels threaten health".[12] 40% of the population in America are at risk of facing adverse health effects because of where they live. The AAF also reports that communities of color, usually low income neighborhoods, are the most vulnerable. These statistics are shockingly high for the United States being one of the most developed countries. The United States is among the most developed nations, the home of creation of the IPhone, Tesla, Microsoft and yet 40% of the population is at risk of detrimental health effects.

Additionally, these adverse health issues that develop because of air pollution are detrimental that shorten life spans. These diseases that develop like lung cancer and diabetes mellitus affect how one lives. Often making day to day activities more difficult and ultimately shortening the lifespan of individuals because of the lack of access to clean air. Where agency

---

[9] Forastiere, Francesco, et al. "Socioeconomic status, particulate air pollution, and daily mortality: differential exposure or differential susceptibility." *AmeriNardone, Anthony, et al. "Associations between Historical Residential Redlining and Current Age-Adjusted Rates of Emergency Department Visits Due to Asthma across Eight Cities in California: an Ecological Study." The Lancet Planetary Health, Elsevier, 27 Jan. 2020, www.sciencedirect.com/science/article/pii/S2542519619302414.*
*can journal of industrial medicine* 50.3 (2007): 208-216.

[10] Torras, Mariano, and James K. Boyce. "Income, inequality, and pollution: a reassessment of the environmental Kuznets curve." *Ecological economics* 25.2 (1998): 147-160.

[11] "Ambient Air Pollution." *World Health Organization*, World Health Organization, www.who.int/teams/environment-climate-change-and-health/air-quality-and-health/ambient-air-pollution#:~:text=Ambient%20air%20pollution%20accounts%20for,cancer%20and%20chronic%20respiratory%20diseases.

[12] Services, AAFA Community. "Air Pollution Harms the Health of 4 in 10 Americans." *Asthma and Allergy Foundation of America*, community.aafa.org/blog/air-pollution-harms-the-health-of-4-in-10-americans.

lies monetarily dictates who has healthy air and who does not. There is a clear correlation that would be unfair and unjust to deny.

**The Poor and Lack of Capital and Choice**

The lack of capital and choice has been touched upon throughout this paper and how it affects the disproportionate amounts of air pollution in low income communities. Low income communities do not have the same amount of capital to invest within their own communities as affluent communities do. This is because of the role property taxes play in determining the amount of funding cities and districts within these cities receive. Additionally, most community members within under-resourced communities tend to not have a college education. Most community members of underprivileged areas are not aware of the detrimental health effects they will experience because of air pollution. The lack of capital, which leads to this lack of awareness, leads to the lack of choice low income communities are put in. Corporations which contribute to air pollution seek vulnerable communities who fit this criteria of lack of capital, awareness, and agency.

An example of this in play is the state of Tennessee and Illinois. Tennessee has "the most dramatic racial disparity… where the share of people of color in the health risk is 43% compared to their share in the population of 21%." While Illinois has a "share of low-income people in the health risk is 18% whereas their share in the state's population is 11%."[13] Both these states prove this trend of low income communities being more vulnerable to air pollution. A company which contributes to Illinois' disproportionate air pollution is Archer Daniels Midland (ADM), an agricultural processor. These companies prey on vulnerable communities because they create a

[13] Ash, Michael, et al. "Justice in the air: tracking toxic pollution from America's industries and companies to our states, cities, and neighborhoods." *Political Economy Research Institute, Amherst, MA* (2009).

narrative of providing more jobs to these low income communities; however, it comes at the cost of their health. Under-resourced communities have no real choice to reject these companies from being built in their communities because they are not aware of the detrimental effects that are to come and the possibility of job opportunities.

**Conclusion of Scientific Analysis:**

The first section of this policy brief discusses the disproportionate effect of air pollution on low income communities in California. It explores the health consequences of air pollution and looks at the historical, geographical, and monetary factors that make low income communities more vulnerable to air pollution. This brief emphasizes the lack of capital, often leading to lack of choice on low income communities, regarding disproportionate air pollution rates. Under-resourced communities cannot afford urban greening or any effective service that can substantially decrease the rates of air pollution. We must implement a policy that is catered towards equity in order for the most affected to benefit.

**Part 2: Policy Analysis**

Air pollution in California disproportionately affects low income/marginalized communities in California. Air pollution has been especially accelerated by automobiles and their popularity. In part two of this policy brief, we will look at California's response to this issue over the years. Additionally, part two will explore a policy recommendation which consists of 1) promoting urban greening led by community members, and 2) incentivizing corporations in urban areas to shift to green energy across California by offering tax breaks resulting in a decreased rate of air pollution in communities throughout California. Policy intervention is not

needed just for the safety of the earth, but for the health of Californians and repairing the consequences of redlining.

## History of California's Air Pollution Policy

### A. Clean Air Amendment

California has been a pioneer in regulating and researching air pollution from automobiles and is often described for its "auto culture."[14] In the 1940s, Southern California "experienced a brownish, hazy, irritating, and altogether mysterious new kind of air pollution…".[15] This air pollution was later identified as smog that was increasing as a result of motor vehicles. There were several policies implemented to control and regulate air pollution. However, one of the most important being the Clean Air Amendment of 1970, which "significantly increased the extent of federal regulation on [air pollution]".[16] Since California was a "special case" in its detection of smog because of its higher rates, California has had more stringent policy regarding air pollution.

### B. California Air Resource Board (CARB)

Currently, California is making an effort to promote electric vehicles to decrease the contribution of motor vehicles onto air pollution. Until recently electric vehicles have become more popular. However, this effort started back in the implementation of "California Air Resources Board (CARB) adopted in September of 1990 a plan to encourage the development

---

[14] Grant, Wyn. *Autos, Smog and Pollution Control. The Politics of Air Quality Management in California*. 1995.
[15] Krier, James E., and Edmund Ursin. *Pollution and policy: a case essay on California and federal experience with motor vehicle air pollution, 1940-1975*. Univ of California Press, 1977.
[16] Greenstone, Michael. "The impacts of environmental regulations on industrial activity: Evidence from the 1970 and 1977 clean air act amendments and the census of manufactures." *Journal of political economy* 110.6 (2002): 1175-1219.

and use of zero emission vehicles (ZEVs)."[17] According to Calef and Goble, this initiative has led to the incentivization of developing electric vehicles; it has been ineffective in "[putting] a substantial number of [electric vehicles] on the road." However, the process to buy an electric vehicle is less convenient. "On average LEAF and Tesla buyers waited more than 6 months while Volt customers waited just over 2 months"; this same study also notes that households with two or more cars are more likely to purchase an electric vehicle.[18] The process to purchase an electric vehicle is time consuming and costly, making it inconvenient to purchase an electric vehicle. These are two things that low income community members do not have. Households with higher incomes are more likely to own more than two cars making them more likely to purchase/own an electric vehicle. CARB is attempting to increase the ownership of electric vehicles with little success.However, low income community members do not have access to buying electric vehicles and are still located near highways and industrial areas.

The CARB also has the role of "[pursuing] conformity with these standards by regulating on‐road vehicle emission standards, fuel specifications, some off‐road sources, and consumer product standards."[19] The standards CARB refers to are decreasing air pollution by mandating air quality standards. Additionally, it coordinates with transportation services to make sure they meet the air quality standards. This is incentivized with the threat of denying billions of dollars in federal transportation funds. While there has been advantageous outcomes, "this regional strategy may not be sufficient to mitigate the highly localized impacts of vehicle‐related air

[17] Calef, David, and Robert Goble. "The allure of technology: How France and California promoted electric and hybrid vehicles to reduce urban air pollution." *Policy sciences* 40.1 (2007): 1-34.
[18] Tal, Gil, et al. "Who is buying electric cars in California? Exploring household and vehicle fleet characteristics of new plug-in vehicle owners." (2013).
[19] Faiz, Asif, Christopher S. Weaver, and Michael P. Walsh. *Air pollution from motor vehicles: standards and technologies for controlling emissions*. World Bank Publications, 1996.

pollutants."[20] It has been found that there is a disproportionate relationship between stationary sources of air pollution in low income communities. Although there is policy to combat air pollution in California, current and past policy have not benefited low income communities at the same rate and under-resourced communities continue to have higher rates of air pollution and high adverse health effects because of this.

**Policy Recommendation**

There is a lack of equity among policy to reduce air pollution in California resulting in the lack of aid to the most vulnerable communities. Policy is needed that is catered to the most vulnerable communities in which past policy has overlooked. Urban greening should be promoted at a grander scale in California by providing categorical grants with funds allocated to lower income communities and there should be a shift among corporations located in low income areas towards green energy. It is important to note that categorical grants are issued by congress and have a defined purpose on what the grant can be spent on. This policy would incentivize by offering tax breaks to corporations opting to use renewable energy resulting in the reduction of air pollution. This benefits low income communities because the adverse effects of corporations and factories being near them are lessened while still providing job opportunities to these communities. It also does not incentivize new corporations to build in low income areas but only the existing ones. Urban greening entails creating more parks and planting more trees in these communities, giving space to under resourced communities to have cleaner and healthier air.

[20] Houston, Douglas, et al. "Structural disparities of urban traffic in southern California: Implications for vehicle‐related air pollution exposure in minority and high‐poverty neighborhoods." *Journal of Urban Affairs* 26.5 (2004): 565-592.

A common concern from progressives regarding urban greening is it can lead to gentrification.[21] However, this can be prevented by having these projects led by community leaders; ultimately, "[fostering] open and inclusive decision making in greening projects."[22] Often gentrification results when organizations and corporations outside of the community come in displacing community members. Focusing on community members leading these projects prevents displacement by improving the state of the community for the community members.

**Funding**

Taxes would be increased to fund urban greening led by community members. However, this is a small price to pay given the urgency of the adverse effects of climate change, with air pollution being one of the most common. Additionally, tax increase would not be by a lot given that corporations would be incentivized to shift towards green technology with tax breaks. The only service that would come with a cost would be urban greening. These tax increments are minute compared to the health issues low income community members often face. Hospital bills would amount to be more costly from adverse health effects caused by air pollution and the shortening of people's life than a state tax increase.

**Conclusion**

Air pollution has become one of the most detrimental effects of climate change and low income communities are facing this issue at a disproportionate rate. This is due to California's history of redlining and the vulnerability of these communities because of their lack of capital.

---

[21] Checker, Melissa. "Environmental Justice and Gentrification in New York City." *Environment: Science and Policy for Sustainable Development* 63.2 (2021): 16-27.
[22] Westphal, Lynne M. "Social aspects of urban forestry: Urban greening and social benefits: A study of empowerment outcomes." *Journal of Arboriculture 29 (3): 137-147* 29.3 (2003).

Not only does this affect what their community looks like - grayer skies- but the overall health of community members. While space is being explored in order to inhabit other planets, there is no planet B for low income communities because of the barrier of wealth. These same people face the most detrimental effects of climate change by being exposed to health issues (i.e diabetes, asthma, etc.) at an accelerated rate. The time is now to implement policy that will aid the most vulnerable communities. The combination of a policy that 1) promotes urban greening led by community members, and 2) incentivizes corporations to shift to green energy across California, by offering tax breaks would result in slowing down the rate of air pollution in communities through California. This policy is essential in California in order to address air pollution, our planet, and the poor.

Works Cited:

"Ambient Air Pollution." *World Health Organization*, World Health Organization, www.who.int/teams/environment-climate-change-and-health/air-quality-and-health/ambient-air-pollution#:~:text=Ambient%20air%20pollution%20accounts%20for,cancer%20and%20chronic%20respiratory%20diseases.

Ash, Michael, et al. "Justice in the air: tracking toxic pollution from America's industries and companies to our states, cities, and neighborhoods." *Political Economy Research Institute, Amherst, MA* (2009).

Ash, Michael, and T. Robert Fetter. "Who lives on the wrong side of the environmental tracks? Evidence from the EPA's risk‐screening environmental indicators model." *Social Science Quarterly* 85.2 (2004): 441-462.

Brooks, Khristopher J. "Redlining's Legacy: Maps Are Gone, but the Problem Hasn't Disappeared." *CBS News*, CBS Interactive, 12 June 2020, www.cbsnews.com/news/redlining-what-is-history-mike-bloomberg-comments/.

Carson, Richard T., Yongil Jeon, and Donald R. McCubbin. "The relationship between air pollution emissions and income: US data." *Environment and Development Economics* (1997): 433-450.

Calef, David, and Robert Goble. "The allure of technology: How France and California promoted electric and hybrid vehicles to reduce urban air pollution." *Policy sciences* 40.1 (2007): 1-34.

Checker, Melissa. "Environmental Justice and Gentrification in New York City." *Environment: Science and Policy for Sustainable Development* 63.2 (2021): 16-27.

Faiz, Asif, Christopher S. Weaver, and Michael P. Walsh. *Air pollution from motor vehicles:*

*standards and technologies for controlling emissions*. World Bank Publications, 1996.

Finkelstein, Murray M., et al. "Relation between income, air pollution and mortality: a cohort study." *Cmaj* 169.5 (2003): 397-402.

Forastiere, Francesco, et al. "Socioeconomic status, particulate air pollution, and daily mortality: differential exposure or differential susceptibility." *AmeriNardone, Anthony, et al. "Associations between Historical Residential Redlining and Current Age-Adjusted Rates of Emergency Department Visits Due to Asthma across Eight Cities in California: an Ecological Study." The Lancet Planetary Health, Elsevier, 27 Jan. 2020, www.sciencedirect.com/science/article/pii/S2542519619302414. can journal of industrial medicine* 50.3 (2007): 208-216.

Grant, Wyn. *Autos, Smog and Pollution Control. The Politics of Air Quality Management in California*. 1995.

Greenstone, Michael. "The impacts of environmental regulations on industrial activity: Evidence from the 1970 and 1977 clean air act amendments and the census of manufactures." *Journal of political economy* 110.6 (2002): 1175-1219.

Houston, Douglas, et al. "Structural disparities of urban traffic in southern California: Implications for vehicle‐related air pollution exposure in minority and high‐poverty neighborhoods." *Journal of Urban Affairs* 26.5 (2004): 565-592.

Krier, James E., and Edmund Ursin. *Pollution and policy: a case essay on California and federal experience with motor vehicle air pollution, 1940-1975*. Univ of California Press, 1977.

Services, AAFA Community. "Air Pollution Harms the Health of 4 in 10 Americans." *Asthma*

*and Allergy Foundation of America*, community.aafa.org/blog/air-pollution-harms-the-health-of-4-in-10-americans.

Tal, Gil, et al. "Who is buying electric cars in California? Exploring household and vehicle fleet characteristics of new plug-in vehicle owners." (2013).

Torras, Mariano, and James K. Boyce. "Income, inequality, and pollution: a reassessment of the environmental Kuznets curve." *Ecological economics* 25.2 (1998): 147-160.

Pyzyk, K. (2018, December 04). Study: Low-income neighborhoods disproportionately feel environmental burdens. Retrieved February 12, 2021, from https://www.smartcitiesdive.com/news/study-low-income-neighborhoods-disproportionately-feel-environmental-burde/543498/

Westphal, Lynne M. "Social aspects of urban forestry: Urban greening and social benefits: A study of empowerment outcomes." *Journal of Arboriculture 29 (3): 137-147* 29.3 (2003).

Yang, Tingru, and Wenling Liu. "Does air pollution affect public health and health inequality? Empirical evidence from China." *Journal of Cleaner Production* 203 (2018): 43-52.