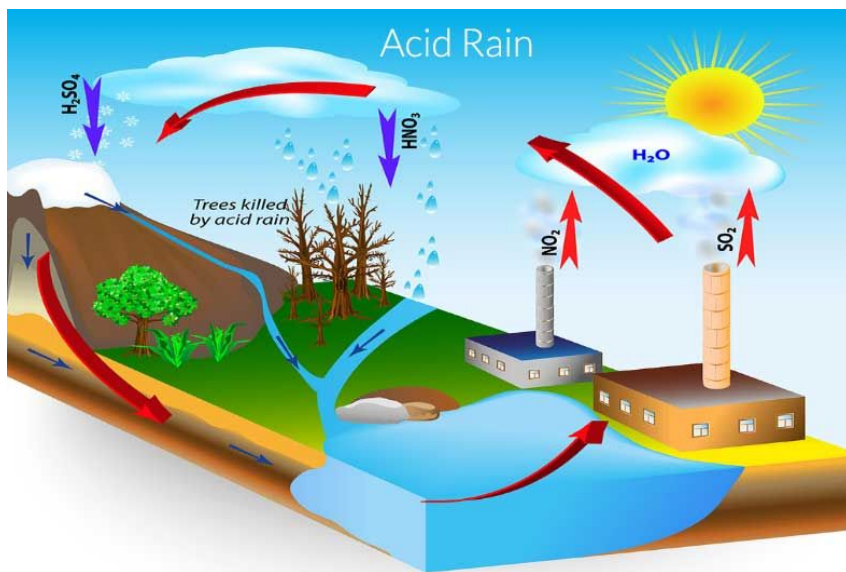


Acid Rain in Nigeria Taylor Camp

Acid Rain Formation:

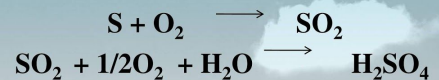
Human activities centered around the exploration of different energy sources release compounds into our atmosphere that produce negative externalities. When power plants burn fossil fuels, they release compounds such as sulfur dioxide and nitrogen oxides. These compounds rise high in the atmosphere where they eventually “mix and react with water, oxygen, and other chemicals to form more acidic pollutants, known as acid rain.” Because sulfur dioxide and nitrogen oxides can dissolve easily in water, these compounds can travel via wind currents and become a part of rain, sleet, snow, or fog.

(Source: https://www3.epa.gov/acidrain/education/site_students/whatcauses.html)

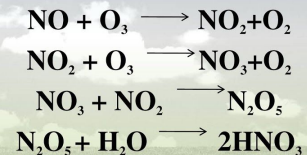


Chemical Processes Involved In acid rain

Formation Of Sulphuric Acid



Reaction Involving Formation Of Nitric Acid



(<http://blog.sciencescore.com/what-causes-acid-rain/> & <https://www.learnpick.in/prime/documents/ppts/details/4142/acid-rain>)

Background/History in Nigeria:

Since the installation of the Erhoike Flow Station in the Delta State in 1963, communities throughout the “Delta, Bayelsa, Rivers, and Akwa Ibom states in the Niger Delta Region” have experienced life changing side effects that are not only health concerns. When the oil and gas exploration began in Nigeria, the people believed it would be a good addition for their community to strive, but sadly, they were wrong. Even though the oil and gas production sites provide some necessary amenities, the side effects are far too great for the people to remain supportive of these stations.

(Source: <http://allafrica.com/stories/201804060107.html>)

Amenities:

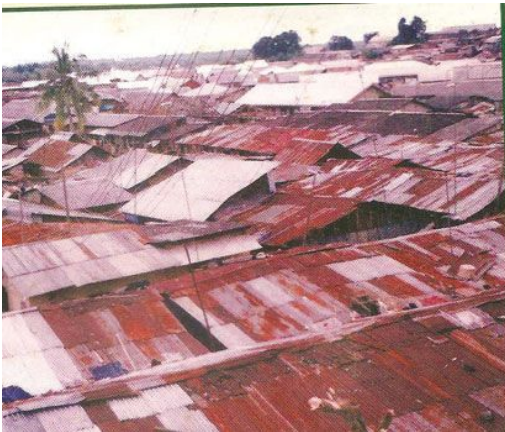
- Source of Light: the gas flaring from the production plants provides light to nearby communities that do not have electricity
- Source of Work: having a oil and gas plant nearby means more available jobs for the residents of the communities to work to raise their standards of living

(Source: <https://www.vanguardngr.com/2018/04/gas-flare-acid-rain-still-haunt-niger-delta/>)

Community Effects:

- Corroded Roofs: the acid rain eats away at the buildings in the area causing residents to need to replace their roofs as little as four months after installation
- Crumbling Structures: when the roofs give away, the acid rain then falls to the rest of the building and causes the other parts to corrode
- Polluted Water Sources: no electricity means no running water and because of the acid rain in the area, the community drinking water becomes heavily polluted
- Reduced Biodiversity: the polluted land and water in the area results in the death of a number of different species in the area, primarily fish
- Reduced Agricultural Yields: acid rain falling on agricultural land results in a reduction in the nutritional value of the crops as well as the amount of the crops produced

(Source: <http://pubs.sciepub.com/jgg/2/3/6/index.html>)



Health Effects:

- There have been many different studies that link “elevated levels of fine particles [with] increased illness and premature death from heart and lung disorders, such as asthma and bronchitis.”
- (Source: <http://www.rst2.org/msu-library/wp-content/uploads/2016/02/ef4.pdf>)
- Many women in the Niger River communities have experienced premature labor on top of these other health concerns that become even more apparent in children.
- (Source: <http://allafrica.com/stories/201804060107.html>)

Government Help?

- When the side effects of acid rain became so great, residents began forming activist groups to petition to end the gas flaring
- Gas flaring became illegal in Nigeria in 1984 but it is cheaper for the oil and gas companies to pay the fines rather than to stop the gas flaring
- Due to this lack of government funding and support, communities have been feeling the negative externalities of the power plant and will continue to until the government intervenes
- (Source: <http://platformlondon.org/2010/03/25/gas-flaring-linked-to-acid-rain-climatologist-warns/>)

Other Sources:

- <https://www.epa.gov/acidrain/effects-acid-rain>
- https://www.researchgate.net/profile/Orish_Orisakwe/publication/23224988_Acid_Rain_Phenomenon_in_Niger_Delta_Region_of_Nigeria_Economic_Biodiversity_and_Public_Health_Concern/links/53d803750cf2a19eee7fef3a/Acid-Rain-Phenomenon-in-Niger-Delta-Region-of-Nigeria-Economic-Biodiversity-and-Public-Health-Concern.pdf