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Guyana, Climate Change

### **Guyana: Sustainable Growth in the face of Climate Change**

Climate change is a pressing global issue, with many offering solutions as to how to fix it. The country of Guyana can show us two important things; why we need to solve this issue, and how difficult it may be to implement. Guyana is at grave risk from rising seas and rain-induced flooding, which drove it to be a dedicated climate change advocate. Recently, however, Exxon Mobil found oil in the region, which raises doubts about the ability of the country to maintain its climate forward position.

Guyana is a small country formed out of the Trans-Atlantic Slave Trade. Its position in the northern part of South America, with access to the Atlantic Ocean, made it valuable for Dutch and later British colonizers. Due to this colonization, it is now the only South American country that lists English as its official language. The slave trade also resulted in a surprisingly diverse country. 44% of the population is Indo-Guyanese, 30% of the population are Afro-Guyanese, 17% are of mixed heritage, and 9% are indigenous to the country (Domonoske).

This diversity extends to the geography of Guyana as well. The country is around the same size as Idaho but surprisingly boasts 3 different geographic regions. The coastline of Guyana is low-lying, so low that man-made sea walls and canals have been constructed to prevent flooding. The largest portion of the country consists of rainforests, which is where most of the crops are grown. Unfortunately, even with this grand geography, only around 2% of the country is arable land, and only 0.1% of it is being used for permanent crops (*Guyana Geography*). This is due to an impressive conservation effort of the rainforest within the country, which now covers 82% of the nation (Arsenault).

In terms of food, root vegetables like cassava and sweet potatoes are staples within the household. Seafood coming from the coast is also a common part of the diet. Rice is the most common grain that is grown throughout the country. The challenge with all these sources of food is that they are all susceptible to rising water levels and erratic weather patterns caused by climate change. Increased rainfall has also caused rice fields and infrastructure to flood. Without proper intervention, climate change threatens to completely destabilize all food production in the country and make it uninhabitable.

These threats will affect each group within the country in a different way, but we can see a general trend between indigenous people and the people living in the more urban parts of the country. The poverty rate across the country was measured at 41.2% in 2017 and is above 50% in rural communities. The poorest people in the country are young people. 47.5% of kids who are younger than 16 are living in poverty and

within the 16 to 15 age group, the number is still high at 33% (Jaayfer). The house size in Guyana varies by region; 3.7-5.5 people per house depending on where you are. (*Guyana Housing Census 28*)

Most indigenous people in the country live inside thatched roof homes in the rainforest. Indigenous households are further plagued by poverty. They earned somewhere between GY\$10,000 and GY\$40,000, which is roughly equivalent to \$47-\$191 per month. Additionally, unemployment runs rampant throughout these tribes, especially among the 18-25 age group. The biggest reason is a lack of job availability and illness. The training of human capital among these populations is also severely lacking. Education beyond a primary level is cited as a main concern for the Guyanese people as many of them can't find meaningful education to fulfill better jobs. Access to clean water is also an issue. With no access to a communal treatment system for water, many water sources go untreated. There is no electricity or internet, and there are also concerns about adequate health care (Bollers et. al 43-48).

Even when people get an education and proper resources, they aren't staying in Guyana. This phenomenon called "brain drain" plagues the entire country, and is contributing to major economic instability. Only around 14% of graduates are staying in the country ("*Guyana's brain drain*"). Indigenous people will move out into more urban centers and people already in the urban centers leave the country. This isn't a good sign for the economy as it cannot grow without adequate training for workers. These problems compounded with climate change have made the situation in Guyana dire.

To combat some of these problems, the Guyanese government has turned to oil. Exxon Mobil found oil in Guyana's seas which promises massive economic growth, but this choice will force Guyana to contradict previous climate initiatives. Guyana has been a strong climate change advocate. Their forest sustainability was so successful that Norway paid a lump sum of 9.1 billion dollars over 5 years under a forest protection deal that ended in 2019. While this is a generous amount of money, it seems to pale in comparison to the amount that is being generated by the current deal with Exxon Mobil. The deal, named the Production Sharing Agreement (PSA), is structured in such a way that Guyana receives royalties on all oil profits made in Guyana. In April of 2022, around 4.3 billion dollars were deposited into a natural resource fund from these royalties (*Guyana Chronicle*). Early estimates put the total money that would be generated at around 10 billion dollars, but at this rate, we should see numbers even higher. This money has multiplied the national budget: in 2021 the national budget was around 1.837 billion. The deal was signed under the belief that this money would be reinvested back into Guyana, but some officials worry about the nature of the agreement. Leveraging how much Guyana needs the money, Exxon negotiated very favorable terms for themselves. The deal forces Guyana to have an extraordinary reliance on Exxon, which raises concerns that the money will be put towards policies benefiting Exxon over Guyana. It also gives Exxon a higher share of the money in the short term, with Guyana making more money later on throughout the contract. If the world decreases its usage of oil, Guyana could be left out to dry (Domonoske).

In the above scenario, less global oil usage has major economic consequences, but alternatively increased oil usage is something Guyana can't afford. Water levels are rising faster than the global average in the region. One of the only protections Guyana has is a sea wall originally constructed back when the Dutch colonized the country hundreds of years ago. These rising sea levels are contaminating water wells with salt water, further contributing to food insecurity. Furthermore, increased rainfall is also a threat. Indigenous farmers have trouble farming when rainfall patterns aren't normal. Drainage systems cannot cope with this influx of water. Recently, during a period of prolonged rainfall, the water didn't drain for weeks. Rice fields became lakes 6 feet deep, livestock died, and fruit fields drowned. Any progress to help Guyana would have to upgrade these systems (Domonoske).

The biggest problem that faces Guyana is trying to balance both needs. Guyana needs the money desperately, but if the money is coming from oil the climate change effects may hamper the long-term success of this investment. The solution to this is not to immediately turn down this oil money, but rather to give other investments and avenues to diversify the Guyanese economy away from long-term reliance on oil money. To help situate the economy for the future, in this paper we will look at different ways to improve agriculture production to increase jobs, increase economic stability, and bolster climate protection.

One of the most promising solutions is Foreign Direct Investments (FDIs), specifically in agriculture. An FDI is as simple as the name implies; it is an investment directly into a company in another country to bolster its economy. The reason this solution could have success is that it diversifies the Guyanese economy away from needing oil. Oil investments can also be used as leverage. Oil investments signal more money from the country which can potentially encourage further investments. FDIs can increase welfare by giving the country better access to modern technology, education, infrastructure, and healthcare (Djokoto). In Guyana specifically, FDIs seem to fit perfectly to help solve the myriad of issues plaguing the country. Most farming is done on a small scale without heavy farming equipment. As agriculture is one of the biggest sectors for Guyana, this investment in heavy farming equipment is necessary, especially for the native people. Heavy equipment alongside better farming practices could significantly increase productivity and profit. This investment would not only improve current farming methods but also create new farming jobs. As stated earlier, unemployment is mostly due to low job availability. Creating high-paying jobs not only helps the unemployed but also keeps educated workers in the country. "Brain Drain" could realistically counteract any progress made if everyone leaves, so creating reasons to stay within the country is essential.

These investments could do a lot to improve the actual farming practices as well and could in theory help stop food insecurity within Guyana. Care needs to be taken that these practices do not encourage deforestation of the rainforest that has been conserved so well. This means that efforts need to be made to maximize the utility of the 2% arable land available. Multiple investments could be made here, one of the most promising being greenhouses. These circumvent issues with erratic rainfall patterns by regulating the environment for the crops. In India, these greenhouses yield five to eight times the surrounding fields.

Greenhouses are a promising solution for bigger agriculture production but may be unavailable for some small native farmers. Those farmers would benefit from practices such as conservation tillage and integrated pest control that have increased yields by an average of 80% in certain countries, according to a study done by the American Chemical Society. This study also concludes that these practices would use less water and fewer pesticides, which are two things that would help Guyana due to erratic weather patterns (*American Chemical Society*). Recent studies have shown better farming practices increased the nutritional content of food, which could help with malnutrition. In Tanzania, researchers showed how sustainable farming practices increased biodiversity and contributed to a better diet. They also concluded that better mental health outcomes came from this farming (Kulkie).

These improvements to funding in agriculture would coincide with other efforts already happening in Guyana. As recently as July 2022, the Ministry of Agriculture invested \$37 million in the New Guyana Marketing Corporation, which specializes in agro-processing (*Department of Public Information*). This would make it even easier to export the agriculture produced by these FDI investments. Balancing the capacity to produce with the capacity to send those products to buyers is very important. With increased revenues, it seems likely that these investments will continue.

The aim of these investments is, in combination with the royalties, to have enough money to bolster the economy. This will only be successful however if, in the long term, Guyana can live through the effects of climate change. This makes additional expenditure on flood prevention and climate mitigation key. As outlined in their 2020 budget there are plans to upgrade the sea wall. This could and should be considerably ramped up, to make sure flooding crises don't continue. Additional funding is also needed for the Guyana Flood Risk Management Project, which would fund vital initiatives to prevent flooding. This includes upgrading the Liliendaal and Ogle drainage basins, strengthening flood forecasting, and providing better monitoring of existing flood prevention systems (*Strengthening Guyana*). Outside help could also be recruited, especially from the Dutch who have consulted with many coastal countries on how to implement flood prevention systems.

Another climate change prevention technique that could be utilized is the restoration of mangrove forests. These forests help filter sea water out from the land, and help reduce flooding overall. This is a natural solution that would be less invasive and cost less than maintaining the sea wall. The DHI group outlines how projects like this would work. It would need to be monitored and protected from Illegal logging, but overall could do great work to keep coastal flooding at bay (*DHI Group*).

In general, this oil money needs to be spent with caution. Wasting this money would leave the country in a terrible position in the long run. If there is extra money that isn't going into economic investment and climate change prevention, there are other places that could go which would cause major positive impacts. The country has been decreasing the amount spent on education, which decreases resources for children's education. The Global Partnership for Education has been working with the government to increase

learning opportunities regardless of background and increase the quality of education based on location. With more money, we could increase access to technology which is also needed. Current illiteracy is a major cause of unemployment and therefore increasing literacy will also improve food insecurity (Ramtahal). Increased training and education make Guyana a more profitable country to invest in and stay in. Quality of life changes like investment in infrastructure would also be beneficial.

Overall, there are numerous things that the revenue generated with oil drilling could be applied towards. Top priorities would be flood prevention and better farming investment, as these would have the greatest impact. This is all with two major caveats, oil money and foreign aid are sufficient and the global community takes more decisive actions against climate change. Many solutions posed in this paper are preventative measures, and will have some impact, but can't fully solve the main problem. Guyana alone cannot stop climate change and therefore it is incumbent upon the global community to decrease fossil fuel usage. This paper describes only a few stepping stones towards making positive changes in Guyana. The improvement of the lives of indigenous people, flood prevention, and better farming practices all are promising solutions, and we must as a global community do our part to make sure they have their desired impact.

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