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Nigeria, Spoilage and Food Waste

Nigeria: A Better and Sustainable Future

With over 250 dialects and languages, Nigeria is considered to be a country full of diversity and life (Britannica). Not only does Nigeria flourish with diversity and life, they are also blessed with natural resources like oil and gas (Britannica). Despite all these contributing factors, Nigeria is burdened with the lack of food they have and more importantly, the amount of food that is being wasted due to spoilage (World Food Programme). With the help of solar paneled refrigerators, composting and more access to electricity, Nigeria will be able to move forward lessening food scarcity and creating a sustainable future.

As of 2023, Nigeria has 226,280,557 people in which 53.9% of the population is urban, and 46.1% is rural (Worldometer). The Nigerian government, which runs as a democracy, consists of an executive that is run by the president, the legislature with a Senate and House of Representatives, and a judiciary that is headed by a supreme court (Hoffmann and Wallace). With 70.8 million hectares of agricultural land area, the main vegetables planted are maize, cassava, guinea corn, yam beans, millet, and rice (Tsokar). The average size for the farm that grows these crops varies between 1 to 3 hectares (Michael). This is about 8 football fields combined. Nigeria varies with their climate and weather based on the region. For example, the climate in the south is “a tropical monsoon climate, the tropical savanna climate is present in most of the central regions, and a Sahelian hot and semi-arid climate in the north of the country” (“World Bank Climate Change”). This leads to a decline in precipitation from the south to the north (“World Bank Climate Change”).

A typical family size in Nigeria is 5.06 persons but depends on the area they live in (Reports). Rural areas have an increase with the average of 5.42 and urban areas have less with an average of 4.5 individuals (Reports). “Staple foods of the Nigerian diet contain yams, cassava, plantains, and rice. Common dishes include pounded yam, jollof rice, and okra. Nigerian meals traditionally are paired with a sauce made with fish, meat, or chicken” (AFS-USA). Agriculture in Nigeria plays a major role in their economy, taking up 35% of the country's population that is engaged in farming. As a result, many Nigerian dishes are made from locally sourced ingredients (Slattery). More than 60 million people in Nigeria do not have access to basic clean water supply (“Water and Climate Change"). With that being said, an unreliable and expensive energy supply greatly affects rural and peli-rural areas (Pelz). As a result, continued conflict, climate change, inflation and rising food prices are major events affecting Nigeria the most (“25 Million Nigerians”).

One of the biggest problems Nigeria faces is food scarcity due to the amount of fresh food being wasted. Nigeria accounts for 40% of their food being wasted (Haruna). Because of this, 31 percent of the country’s total land use accounts for 5 percent of its greenhouse gas emissions (Alagboso). This created a chain of problems that led to bigger issues like “poverty, environmental degradation, and life-threatening diseases that unleashed a high economic burden on the country” (Haruna). With that being said, the

reasons for a decline in the “food supply and security are pests and diseases, a lack of processing facilities, and inefficient transport systems that are human-made” (Haruna). Since food loses its nutritional value immediately after it has been harvested, they need to be stored and transported in a cooled area in order to slow down the rotting process (Alagboso). With the lack of these refrigerated areas, ninety-three million small farmers in Nigeria have lost their products (Alagboso). A big factor in Nigeria's food scarcity is the environmental factors of where these products are being produced. Examples of these include climate change,water, land, and biodiversity. This creates problems such as soil erosion, water management, soil quality, and air and water pollution (Haruna). “Around 470 million smallholder farmers and supply chain actors lose an average of 15 percent of their income to food spoilage. Spoilage limits how much of their harvest they can sell, and in times of surplus the risk of spoilage may prompt farmers not to harvest at all to spare themselves the hard labor required for diminishing returns. Another consequence is that the inputs — including labor, water, seed, fertilizer — and their environmental costs are lost along with the product” (“Food Waste and Spoilage”). Because of the lack of electricity, powering a fridge will be difficult for families, farmers, and vendors to keep food fresh. One of the main reasons why there is an increased amount of spoilage and waste is because of the extreme climates in Nigeria where people have no way to keep the heat from spoiling the foods (Shraddha).

One solution to keep Nigeria’s food fresh from these conditions are solar paneled fridges and cooling areas. Organizations like All-On and Cold-Hub have funded projects like this in the past. Cold-Hub has created solared powered walk-in cold rooms for fresh produce which can keep them good for up to 21 days, lowering post harvest loss by 80% (“Solar-Powered Cold Storage”). Fundraisers and charities can play a big role in founding money to create these items. Tech companies can also donate solar panels and parts to build fridges and cooling stands. “With limited budgets for rural electrification, governments are attempting to bridge this investment gap with innovative public, private, and blended investment arrangements. Public finance tools can include grants and subsidies for mini-grid projects… In Kenya, the government provides subsidies to incentivise private mini-grid developers, who can then go on to bid for additional project funding from development banks” (Zajicek). The Renewable Energy Master Plan (REMP) also seeks to increase the supply of renewable electricity. Renewable electricity would then account for 10% of Nigerian total energy consumption by 2025 (“Nigeria Renewable Energy”). Solared powered cooling stations and refrigerators can be considered sustainable because not only is it a solution to preventing waste, the solar panels are good for the environment. “Generating electricity and heat by burning fossil fuels – coal, oil, or gas – causes a large chunk of the greenhouse gasses, such as carbon dioxide and nitrous oxide, that blanket the Earth and trap the sun's heat” (United Nations). With the materials and money to fund the creation of solar power fridges and cooling stations, families, farmers, and vendors will have a safe place to store their food, preventing waste.

In addition to solar paneled refrigerators and cooling areas, composting is another way to help reduce food wastage in Nigeria. Composting is one of the many ways to benefit the food community in Nigeria and can help with their waste problem. “Composting is the natural process of recycling organic matter, such as leaves and food scraps, into a valuable fertilizer that can enrich soil and plants”(Hu). This process leaves the soil rich with nutrients allowing vegetables to flourish (Hu). The result of composting can help Nigeria since “the food waste compost fertilizers can decrease the solidity of soil and bulk density by enhancing the soil's porosity and aeration. It can also improve saline water leaching and decrease soil acidity, as well as soil's humus content and allows for beneficial microbes to grow. The food waste

fertilizer is also environmentally friendly and cost-effective" ("Safeguarding Food Security"). One company in particular, Lomi, can help Nigeria with composting. Lomi is a company that specifically focuses on sustainability when in the kitchen. They create composters that target food scraps and turn them into nutrient rich fertilizer ("Discover"). Customers who tried it out mentioned that it is easy to use and can break down a variety of items (Nast). This can be useful in Nigeria by taking leftover food or spoiled food and instead of wasting it, farmers and families can turn it into dirt. This ensures that less food is being wasted and whatever is wasted is going back to the gardens to produce more.

Furthermore, generating electricity can help reduce food wastage in Nigeria by powering up storage containers. In Nigeria, temperatures that can reach around 40°C (104 f) make food storage difficult for farmers, food shops and homes (Cheary). Most refrigerators and storage need electricity but according to 2021 World Bank figures, "more than 40% of the country's population have no access to modern energy" (Cheary). Harsh weather also makes it difficult to generate a stable power grid to gain electricity ("Electricity Is Key"). Many farmers use electricity to power tools that help harvest and grow crops ("Electricity Is Key"). By generating more electricity, farmers will save more money without the added stress of taking out loans and investments (Access). Programs like Cooling as a Service (CaaS) focuses on "enabling customers to base their decision on lifecycle cost rather than on the purchase price of cooling equipment" (Access). Not only does this program help provide the equipment for farmers, they also provide them with the needed electricity to power these tools (Access). This can help Nigeria worry less about the cost of electricity and more on growing their crops and preventing food waste. This program also provides funding for cooling stations such as refrigerators and storage containers reducing the chances of food wastage (Access). With the installation of electricity, farmers and families can take that step to ensure that very minimal to no food will be wasted.

In summary, fixing Nigeria's food scarcity problem will need solar panel fridges, a composting system, and more electricity to power fridges and storage containers. With the help from foundations, charities and the government, Nigeria can lessen their food waste and spoilage and further improve their problem with food scarcity leaving the future generations in good hands.

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