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## **Improving Self-Sufficiency in Gabon through Urban and Regenerative Agriculture Development**

### Background & Challenges

Just on the west coast of Africa lies Gabon, a sparsely-populated, former French colony rich in minerals, precious metals, and natural gases. The discovery of oil reserves in 1956 has propelled Gabon into one of the largest exporters of fossil fuels in sub-Saharan Africa. Gabon's gross domestic product (GDP) is one of the highest in its region because of its oil wealth: the industry alone comprises one-third of GDP and 85% of exports. However, this money is concentrated in the hands of a few rich elites—leaving many of its citizens in poverty. Despite strong diversification potential, Gabon focuses its exports on few unprocessed commodities (mainly oil and wood)—creating few opportunities for jobs and perpetuating dependency on imports for necessary goods (Hoogstraten et al.).

Gabon is sparsely populated, with approximately 2.13 million people currently residing in the country. Nearly 90% of people reside in urbanized areas, while the remaining 10% of the population lives in rural villages. The large discrepancy between the rural and urban populations is due to a rural exodus (migration), with Gabonese people seeking more lucrative economic opportunities in urbanized areas (Belebema 5). The poverty rate for the general population is 32.4%, and 35.7% of the young population (ages 15-24) is unemployed (CIA Factbook).

Since the 1990s, Gabon's governing system has taken a more democratic approach: the nation is ruled as a republic with a presidential form of government. Presidents themselves have life terms (previously they only lasted 7 years), and have the power to appoint a cabinet, ministers, and judges for a Supreme Court. The government also consists of a bicameral legislature, with a National Assembly and a Senate. Unlike the President, legislative officials serve limited terms of about 5 years. The 2016 election under this system demonstrated relative political instability in the system because of falsified votes and suspiciously high turnout in some provinces. Thousands were arrested and the opposing party's headquarters were bombed for protesting and disputing the results (Hoogstraten et al.).

Rapid urbanization, along with Gabon's lucrative mining industry, has caused little cultivation of rural land regardless of government efforts to increase the agricultural sector. The oil industry has overshadowed potential to further increase agricultural exports. Currently, only 19% of Gabon is used as farmland. And though some commercial farms have developed in Gabon, much of the farming relies on about 70,000 small families who each grow crops on 0.2 hectares of land—or about 20,000 square feet. Because of the low agricultural productivity on these farms, Gabon is heavily reliant on food imports in order to feed the country. Little (or non-existent) governmental support for market gardening perpetuates the lack of improvement in the farming industry (Graeme 24). Regardless, crops grown on Gabonese farms include rubber, starches such as cassava, yams, tuber vegetables, plantains, and sugarcane.

The typical family size in Gabon consists of about four members, though strong bonds to family members often means extended family lives with one another in the same household. In more remote areas, traditional housing is constructed with materials such as bricks, bamboo, and palm fronds. Rural and urban homes are both often made of tin roofs, but dwellings in the city are constructed with cinder-block whereas rural homes are made of timber wood. Space within the home is designed to be communal; children oftentimes share beds, and private rooms for each individual are rare. Most houses will have

communication devices such as radio and television, but few have access to refrigerators—potentially impacting the storage and ability to retain fresh food.

Especially for rural populations, Gabonese people lack guaranteed access to basic necessities; however, education is compulsory by law. Generally speaking, Gabon maintains a relatively high literacy rate, with 84.7% of the population being able to read and write (CIA Factbook). Gabon requires education for children ages 6-16; the schooling system is modeled off of the French's, with 13 years of schooling and a culminating baccalaureate exam. Most children finish primary school (or the first 6 years of schooling), though only 20% of children continue onto secondary school. Boys are more likely to finish secondary school because they are not confined to the same domestic obligations expected of girls. Rural children also face a disparate quality of education relative to urban people, as village schools lack books, teachers, and other supplies. Healthcare is expensive and much of the medical costs are dependent on the patient to pay. Because of their distance from the city and lack of funds, rural people often do not have access to medical care. Instead, they visit a local healer (called a *nganga*) or a town doctor to cure their ailments. Regardless, diseases such as HIV/AIDS, malaria, and ebola from infected animals continue to kill and plague the rural population.

Road infrastructure and access to transportation is not accessible to the majority of the Gabonese population. Wealthy people and government officials have access to their own cars, bicycles, and motorcycles. For most people, walking is the primary mode of travel. That being said, taxis and buses are available in cities for more long distance travel. With the exception of the capital and major cities, roads are often unpaved and hard to travel through during rainy seasons. One railway system (the Trans-Gabonais railway) provides a route between Libreville and Franceville, which is often used by cargo trains to import goods. Because all imports pass through the capital before moving to interior towns, the cost of bringing imports outside of the capital becomes more expensive than imports remaining in the capital (CultureGrams 250-252).

In regards to the agricultural sector, food is heavily imported because insufficient amounts of produce are cultivated domestically. Agriculture makes up about 5% of the national GDP (Gabon - Agriculture). Typical foods consumed by families include staple crops such as cassava, rice, and plantains; tropical fruits like mangoes, papaya, pineapples, and batangas are also common. France's influence is still seen in Gabonese diets, as beignets (fried dough topped with sugar), croissants, and butter are popular breakfast items, especially in the city. Lunch is the main meal of the day for both urban and rural populations. Dinner is often a light supper for villagers, while city dwellers typically eat larger portions. Meals consist of a staple crop such as cassava (i.e baton de manioc), rice, or plantains served with cooked meat or fish. Rural populations will also hunt wild animals such as snakes, pangolins, or monkeys for subsistence. Water is the most common drink, though beverages such as palm wine, beer, and soda are also common (CultureGrams 251).

Gabon's reliance on oil exports, combined with corruption from government officials and foreign stakeholders, ultimately limits economic development and thus drives the majority of food insecurity. Price fluctuations of oil directly affect the wellbeing and security of the poorest populations. Because so much of the country relies on imports for food, there is a small urban population that relies upon themselves for subsistence—10% of city dwellers practice some form of agriculture, which is disproportionately low compared to surrounding west and sub-Saharan African countries. That being said, the present government has advocated support for diversifying the economy and improving the state of agriculture in the country. The Gabonese government launched the Emergon Gabon Strategic Plan in efforts to both preserve the nation's natural wealth and diversify the economy. One of the focuses of this plan is the "Green Growth" pillar, which seeks to expand the agricultural sector and use it as a means to drive inclusive growth. More specifically, goals established include growing enough produce for the country's food needs, lessening the quantity of food imports (or achieving more favorable balance), and

creating more jobs through local production (Agomba 2). Recently, the Food and Agriculture Organization of the United Nations has developed programs to improve arable land and encourage city populations to grow urban gardens, ensuring greater food security despite economic losses from the COVID pandemic (“An Innovative Program”). Trends have been promising for developing an agricultural sector in order to ensure sufficient quantities of food and improved quality of life.

### Proposed Solutions

Gabon’s proximity to the equator makes its climate ideal for developing an agricultural industry: the amount of rainfall ranges from 120 inches at Libreville (a major city) to 150 inches on the coast, with the majority of it falling between October and May. Humidity remains high throughout the year, and the average temperature stays consistent at around 80 degrees F every day. Seventy-five percent of the country is covered by lush rainforest, which is home to over 3,000 species of wildlife. Most important of these species is the okoume, or a hardwood tree that constitutes the majority of Gabon’s timber exports. (Hoogstraten et al.) (CIA Factbook). In developing plans to expand agricultural growth throughout the country, Gabon should consider using both urban and regenerative farming techniques in order to improve crop yield, food security, and economic self-sufficiency while maintaining natural biodiversity.

Urban agriculture constitutes any production of crops or livestock within cities. With a disproportionate amount of the Gabonese population living in or relocating to urban areas, urban poverty has become more of a prevalent issue, and thus urban gardens could hold the key to alleviating food insecurity. The establishment of city farms, specifically at the local level, has the potential to better ensure food security amongst the poor. Urban agriculture can ensure access to more nutritious foods within a household, but also a source of income especially if surplus produce is sold in local markets (Zezza and Tasciotti 266).

Benefits of popularizing urban agriculture goes beyond the scope of ensuring greater access to food. In other regions of the world, urban agriculture programs improved access to a varied set of crops, and doubly could serve as a youth development program in children’s education. For example, in New York, USA, local gardening programs were found to help develop a sense of self and a stronger bond to the community (Hung 62). Similarly, teaching urban agriculture practices within the Gabonese educational system not only potentially encourages the children to further pursue urban agriculture (in favor of the conventional white-collar, energy related jobs), but also augments their own connection to the food system and sustainability. If the Gabonese Ministry of Education integrates agriculture topics and activities into the school curriculum, the widespread exposure to urban growing methods could help diversify the job market should students become interested in growing and improving self-sufficiency within a city. Encouragement of the large young population into the agribusiness sector will be crucial in Gabon’s goal to grow GDP beyond the petroleum sector. While urban agriculture is unlikely to significantly contribute to industrial exports in Gabon, it does have the potential to encourage careers in agriculture, as well as lessen the reliance on expensive imports of food delivered through the poor road infrastructure.

In other regions of the world, various forms of urban agriculture have been adopted for both entrepreneurial and personal usage. To best minimize upfront cost and steep educational learning curves, soil-based gardens such as community plots should be established. Additionally, soil toxicity testing is imperative to ensuring that crops do not grow in exposure to dangerous heavy metals such as lead. Abandoned lots, landfills, or industrialized sites (that could be repurposed into community garden space) may contain toxic heavy metals. One way to track this is through the usage of x-ray fluorescence (XRF) detectors; these devices are commonly owned by laboratories and universities, but government facilitation (e.g. through Gabon’s Agricultural and Forestry Research Institute) that mediates the usage and loaning of these tools to farmers could be a crucial step in the development of these community gardens. XRF tool

usage could be funded or regulated by the government's sustainability research and development (Latimer et al. 30).

Urban agriculture development directly targets the urban populations; for rural populations, further education in regenerative agriculture techniques could help to increase agricultural output and restore soil destroyed by techniques such as slash and burn agriculture. Regenerative agriculture seeks to integrate native vegetation and animals into the agricultural system, resulting in better crop nutrition and less destruction of the surrounding environment. This technique also rejects the usage of synthetic fertilizers, hormones, and pesticides— or any substance that would inhibit healthy ecological interaction (Giller et al. 14).

One of the main advantages to regenerative agriculture is its sustainability, especially when compared to more monocultural and high-input (industrialized) farming. Regenerative agriculture has major implications for protecting biodiversity in its surrounding areas. Through techniques such as crop rotation, nutrient cycling, and circular usage of waste/production products (i.e. livestock manure as plant fertilizer), rural populations do not have to rely upon expensive and non-sustainable agricultural techniques common to the Western world, such as pesticide usage and the growth of one particular crop in a certain area. In the long-term, soil health and arable land can be maintained through farmer education and consideration of surrounding environmental systems, while also improving economic productivity (Francis et al. 65).

Though detrimental agricultural techniques have been practiced, the nation's sparse rural population has limited the extent of said damage. Adoption of regenerative agriculture as a technique on already-healthy soils—rather than as an attempt to restore damaged, mistreated lands—will ensure that these lands retain their biological state. Additionally, regenerative agriculture will ultimately help increase yield; thirty percent of crop is lost post-harvest because of traditional, non-intensive methods of production. Vested education and focus on regenerative techniques will help to nourish and enhance food security for the general Gabonese population, best develop and utilize the arable lands for cultivation, and increase agricultural contribution to the GBP (Agomba 6).

Gabon's high GDP and status as a "middle income" country stands in direct contrast to the quality of life its citizens experience. With large amounts of arable land, favorable climate, high levels of literacy, and high rates of unemployment—especially among young adults—the nation has untapped potential in expanding its economic state, especially in the agricultural sector. Promoting development and careers in agriculture, especially through youth programs and the establishment of community gardens, will help ensure food security at the local scale and ease the dependency on produce imports in order to feed the urban population. Focus on regenerative agriculture techniques in rural areas will vastly improve economic productivity while maintaining ecological biodiversity and health in rural areas. Finally, Gabon's challenges in food security and poverty (from its dependence on oil exports) can ultimately be mitigated by mobilizing the youth workforce, especially in the underdeveloped agricultural industry.

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