Zane Tickoo New Canaan High School New Canaan, CT Topic: Brazil, Education

Advancing Food Literacy for an Equitable, Sustainable, and Hunger-Free Food System in Brazil: A Pilot Program of Urban School Gardens

As Miguel digs into his serving of rice and beans in the school cafeteria, his eyes light up. It's his first - and only - warm meal of the day.

For Miguel and many students across Brazil, school lunches are a lifeline. The government-subsidized National School Feeding Program (PNAE—Programa Nacional de Alimentação Escolar) is a universal school lunch program offered in all schools and vocational training programs across Brazil. In 160,000 pre-, primary, and secondary schools, these school lunch programs feed over 44 million students, many of whom regularly face hunger and food insecurity at home. Nearly a third of Brazilians experience some level of food insecurity—including limited access to food, poor quality of foods, and a lack of variety of foods (Malleret, 2024). Professor and researcher Catarina Machado Azeredo and her colleagues at Universidade Federal de Uberlândia found that Brazilian children often experience a high prevalence of inadequate food intake and rely on ultra-processed food (UPF) to curb their hunger (Azeredo et al., 2018). So, even with PNAE efforts, there remains a disconnect between Brazil's vast agricultural abundance and the startling hunger rates amongst its citizens—a chasm that can be bridged through food literacy.

As the fifth largest country in the world and the largest in terms of arable land, Brazil possesses the agricultural capacity to feed its population a diverse and healthy diet (United States Department of Agriculture, Economic Research Service, 2022). Brazil is the world's largest agricultural net exporter and a top-five producer of over 34 agricultural commodities, including beef and soya beans (Encyclopaedia Britannica. n.d.). Nevertheless, dietary practices within communities in Brazil do not reflect the diversity and nutritional density of food the country produces. While Brazil's Amazon rainforest offers a diverse range of foods suitable for nutritious meals, including fish, fruits, nuts, and vegetables, many nearby schools serve lunches comprised of processed sausages and industrialized products (Thomas, 2023). Even outside of school, typical diets are predominantly made up of foods with poor nutritional quality and diversity (Carrijo et al., 2018). Children, adolescents, and young adults also report that a high percentage of their diet comes from UPF. Unsurprisingly, the UN Food and Agriculture Organization reports that nearly 5% of the Brazilian population, or roughly 10 million individuals, is undernourished (Azeredo et al., 2018).

Adding to this issue is the fact that the majority (87.8%) of Brazil's nearly 219 million citizens live in crowded urban areas around the Atlantic Coast (Brazil - World Factbook, 2024), leading to a dearth of resources. This region is characterized by favelas (shantytowns in or near large cities) where an estimated 35 million residents lack access to clean drinking water (Brazil Housing Poverty, n.d.). Without clean water and reliable infrastructure like refrigeration and sanitation services, significant challenges exist when buying, storing, and preparing a variety of nutritious foods (Marshall, 2024).

Given that the monthly minimum wage in Brazil is US \$277 and 37% of the population earns less than half that amount (Audi, 2023), it is unsurprising that a typical diet for an average family of four in Brazil contains high levels of cheap processed food. A quarter of the country's adult population gets up to 50% of its daily calories from UPFs, primarily mass-produced bread, cakes, and pies, as well as margarine, salted crackers, cookies, sugary beverages, and meat products like hot dogs (Bendix, 2022). The reliance on UPF means that while many Brazilians manage to curb hunger, they are not meeting basic nutritional thresholds. Brazil's quality food is simply not reaching all communities equally; low-income communities struggle to find healthy foods at accessible prices locally (Marshall, 2022).

Food systems, which include the cultivation, distribution, and accessibility of foods, are a significant driver of food disparities like this in Brazil and other countries. Educating people, especially at a young age, about their local food systems is imperative for empowering them to demand and work towards improved food access, diversity, and sustainability, locally and nationally. Food education, which enhances food literacy, is intrinsically linked to food security. Food literacy encompasses knowledge about nutrition, cooking skills, budgeting, and accessing healthy foods (Raffray, 2012). It empowers communities to learn how to produce and access healthy, nutritious foods, granting them sovereignty over food and health. By harnessing this knowledge to better control their food's production, cultivation, and processing locally, people can more effectively curb hunger—a far more sustainable lifeline than highly processed school lunches.

A study of Brazilian adults—including healthcare providers—highlights the country's need for greater food literacy. In the study, a significant portion of healthcare providers considered numerous processed foods like gelatin, cereal bars, and processed turkey breasts healthy, indicating a culturally influenced rather than scientific perception of foods (Zeminian et al., 2024). Since primary healthcare professionals often provide food and nutrition advice to their patients, a lack of food literacy can lead to harmful beliefs about the effectiveness of nutrition interventions. Furthermore, Brazil's food literacy is hampered by a lack of pertinent information for consumers. For example, Brazil has relatively low standards for "front-of-pack nutritional labeling," which informs consumers of a product's added sugars, saturated fats, or sodium content (Mais et al., 2022). A 2022 study applying Mexican and Brazilian labeling standards to 3,335 food products found that almost all products warrant a warning label under Mexican law, while only about half warranted the same warning under Brazilian standards (Tomaz et al., 2022).

The lack of food literacy in Brazil's population is surprising, given the country's groundbreaking food policy initiatives in other areas. Brazil's "Zero Hunger" strategy, established in 2003, consolidates various existing government programs under a single policy directive to strengthen family farming, improve food access, generate income, and enhance social participation. The strategy aims to reduce food prices and protect excluded populations, thereby increasing demand and providing better outlets for local farming, with subsequent laws like the National Law on Food and Nutrition Security (LOSAN) ensuring the right to adequate food. However, food education and literacy were missing from the strategy until recently (Raffray, 2012).

In the past few decades, Brazil attempted to improve food literacy through its government-subsidized PNAE initiative. The program required complementary educational programs like food education and cooking classes alongside the school lunch program, but these programs have yet to be uniformly

implemented (Sidaner et al., 2013). A 2021 study found that 9.3% of Brazilian schoolchildren reported they had never had access to any information about proper nutrition (Farias et al., 2021). Additionally, most respondents in the study reported difficulties in understanding, evaluating, and applying healthy eating information even after receiving routine educational information, highlighting the need for effective programs.

Introducing effective food literacy to children is critical. Eating habits begin developing during childhood, making it a pivotal time for promoting healthy habits. Furthermore, as children mature and develop more complex cognitive abilities, continuing food literacy education will help them navigate a complex food system (Ares et al., 2024). In 2023, Brazilian President Luiz Inácio Lula da Silva took a step in the right direction by signing a decree outlining a comprehensive framework for promoting healthy eating habits in school environments nationwide. The decree mandates the integration of food and nutrition education into school curricula, limits the sale and donation of ultra-processed foods and beverages within school premises, and restricts the marketing of unhealthy food and beverage products in the vicinity of schools. While promising, the decree does not have regulatory power. It only guides future discussions and encourages local and state governments to build upon the principles above when enacting specific policies tailored to their unique contexts (A Landmark Decree Ushers in a New Era for School Food in Brazil, 2023).

Other countries have seen success by implementing similar education laws to complement their school lunch programs. Japan, for example, passed the Shokuiku Law, mandating the integration of food education into the national curriculum at all levels of schooling (Reiher, 2012). A 2019 review of the Shokuiku Law's effectiveness by Hunter College NYC Food Policy Center found that the law has had a positive impact on students, teachers, and families, including increased interest in nutrition and awareness about food access (Apel, 2019).

However, implementing the Shokuiku Law has had its challenges. Acquiring materials, training teachers, and developing the curriculum are all resource-intensive. The outcomes amongst schools also differ with school quality. Furthermore, because the initiative is government-funded, there is a risk to its continuity across regime changes (Harlan, 2013). Similar issues are evident in Brazil. The country's economy, often characterized by volatility and inequality, directly affects the government's ability to reliably allocate resources for social initiatives. Additionally, Brazil's frequent shifts from progressive to conservative regimes can impact social spending, either bolstering or undermining social program initiatives.

One solution to these inefficiencies in the government system is partnerships between government and non-governmental organizations. For example, the U.S.-based Edible Schoolyard Project is an independent organization that partners with public school districts to offer food education programs, including edible gardens, running a teaching kitchen, and field trips and events celebrating local foods, food culture, and food professionals. Their most recent project entails partnering with California's Stockton municipality and will launch projects in every local public school in the locale. The partnership is mutually beneficial, allowing the Edible Schoolyard Project to study the efficacy of large-scale implementation and local government to offer a universal food literacy program. Additionally, the Edible Schoolyard project typically relies on a mix of private donations, government funding, corporate sponsors, and university partnerships to fund its projects. These partnerships also provide access to

professionals with vital expertise in agriculture and education. These benefits will directly impact the Stockton School children. Looking to examples outside of the West, the Slow Food Foundation for Biodiversity (SFFB) partners with government-led national school feeding programs in thirty African countries to build edible gardens on school grounds, illustrating the success of government-NGO partnerships across the globe (https://www.fondazioneslowfood.com/en/). Just like in the Edible Schoolyard Project, SFFB raises funds by grassroots efforts through online advertising, farmers market stands, corporate sponsors, and government funds; as a result, the project is financially viable.

The collaboration between public and private organizations is mutually beneficial. NGOs can circumvent government red tape and make up for shortfalls in local education budgets. Entering into a contract with national and local governments offers NGOs legitimacy and access to projects that have a big impact, as well as creating opportunities to expand their future work (Lui, 2023). Launching a similar collaboration between an NGO and the government could work just as effectively in Brazil to improve school-based food literacy education.

As stated before, Brazil's government is already a leader in school-based food literacy and nutrition programs; it simply struggles to implement programs equitably across all districts. Partnerships with local NGOs already operating in the edible garden and food literacy space could help. São Paulo-based Cidades Sem Fome (CSF), for example, already develops sustainable agricultural projects in urban neighborhoods (https://www.cidadessemfome.org/en). Founded in 2004, CSF teaches individuals to manage organic farming businesses and achieve financial independence by selling their produce to PNAE suppliers ("Toward the Human City", n.d). It also builds gardens in public schools, which provide fresh food for students and create opportunities for children to learn about tending to and harvesting from the gardens. As of 2023, CSF had built 38 school gardens, reaching 14,506 children. In partnership with Brazil's Ministry of Education, they could scale their impact to all of São Paulo's 5,100 schools (OECD/The World Bank, 2022). Operation in CSF's home base of São Paulo could work as a pilot study, and local government and national ministries currently in charge of educational food programming could complement their classroom offerings. CSF could use government and private funding from donations and corporate sponsors to create edible gardens and urban farms in all São Paulo schools while running programs that teach children how to produce and prepare healthy and nutritious food.

The partnership would function on a contract basis. CSF would bid on the contract to run Brazil's school garden and food literacy programs, which would then provide free produce to the government-run feeding program. As a contractor, CSF or similar organizations would have the resources, expertise, and flexibility to implement programs that the local education departments lack the resources to implement (Lui, 2023). Likewise, given CSF's status as a contractor, the Brazilian government will still have significant oversight over the implementation of the project, mitigating the risk of poor implementation by NGOs (Fontes Filho, 2017).

Contracting with CSF would reduce the resource stress of the government in implementing the program under its own central bureaucracy (Fontes Filho, 2017). In fact, it seems that corporations would be keen to participate in such a program. Food giant Nestlé publicly apologized for promoting unhealthy foods in remote communities and has since invested over US \$60 million to develop healthier alternatives and advance food education in these areas of Brazil (Mello, 2019).

By partnering with CSF, Brazil's government would ensure a diversity of products, food sources (from local, small urban farms), access (from farm stands), and food choices (organically grown, natural foods), which are all important considerations in promoting and maintaining a resilient food system for all. With children working on their gardens and parents employed at small neighborhood urban farms, communities would be inspired to explore the benefits of consuming locally grown agriculture over highly processed food products and sustainable food choices to decrease food waste, save money, and reduce hunger in impoverished populations.

This would also benefit CSF, granting it universal access to schools, where it could establish edible gardens and teaching kitchens for all schoolchildren. The crops grown in the school gardens can also be used directly in school kitchens alongside crops grown through CSF's non-school farms, meaning locally grown produce ends up on plates in all communities. The money the government uses to procure food for school lunches would then be paid to CSF projects, creating a virtuous circle.

The new farms would also offer employment and volunteer opportunities for community members of all socioeconomic backgrounds, strengthening social cohesion. The participation of local farmers, newly employed garden managers from Brazil's large unemployed population, and schoolchildren would create a cyclical, hyper-local food system that democratizes food production and consumption. Furthermore, children would gain a practical food literacy education.

Increased food literacy—through classroom learning and hands-on participation—would benefit children and adults alike in Brazil. By addressing the link between food literacy and food insecurity through education, communities can work towards a future where everyone has the knowledge and means to nourish themselves and their families adequately. Incorporating learnings from the success of programs in Japan and the U.S., a partnership between Brazil's government and NGOs would also specifically benefit children, as it would foster better nutritional practices, promote regional culinary industries, and educate future family leaders on sustainable food practices—creating lifelines for generations to come.

Works Cited

- Ares, G., De Rosso, S., Mueller, C., Philippe, K., Pickard, A., Nicklaus, S., van Kleef, E., & Varela, P. (2024). Development of food literacy in children and adolescents: Implications for the design of strategies to promote healthier and more sustainable diets. Nutrition Reviews, 82(4), 536–552. <u>https://doi.org/10.1093/nutrit/nuad072</u>
- Appel, D. (2019, November 19). Japan's School Lunch Program Serves Nutritious Meals with Food Education. Hunter College New York City Food Policy Center https://www.nycfoodpolicy.org/food-policy-snapshot-japans-school-lunch-program/
- Audi, A. (2023, June 26). Hunger has a profile in Brazil, a new study finds. The Brazilian Report. https://brazilian.report/liveblog/politics-insider/2023/06/26/hunger-race-gender-study/
- Azeredo, C. M., de Rezende, L. F. M., Canella, D. S., Claro, R. M., Peres, M. F. T., do Carmo Luiz, O., ... & Levy, R. B. (2016). Food environments in schools and in the immediate vicinity are associated with unhealthy food consumption among Brazilian adolescents. Preventive medicine, 88, 73-79. https://pubmed.ncbi.nlm.nih.gov/27050024/
- Bendix, A. (2022, December 30). Highly processed food linked to early death, study finds. NBC News. https://www.nbcnews.com/health/health-news/highly-processed-food-linked-early-death-study-rc na55455
- Brazil—World Factbook. (2024). In The World Factbook. Central Intelligence Agency. https://www.cia.gov/the-world-factbook/countries/brazil/#people-and-society
- Brazil Housing Poverty. (n.d.). Habitat for Humanity GB. https://www.habitatforhumanity.org.uk/country/brazil/
- Encyclopaedia Britannica. (n.d.). Brazil Agriculture. In Encyclopaedia Britannica. Retrieved May 09, 2024, from https://www.britannica.com/place/Brazil/Agriculture
- Farias, P. K. S., Sales, M. S. M., Barbosa, A. C. M., Andrade Filho, G. S., Leite, A. S., de Oliveira, F. B. S., Eleutério, T. P., dos Reis, É. C., Monteiro, E. L. de F., Souto, C. de A., Santos, A. S. F., Sampaio, H. A. de C., & Martins, A. M. E. de B. L. (2019/2020). Food literacy among adolescents from public schools in Montes Claros, MG, Brazil. International Journal of Advanced Engineering Research and Science (IJAERS). https://ijaers.com/detail/food-literacy-among-adolescents-from-public-schools-in-montes-claros-mg-brazil-2019-2020/
- FAO Country Profiles: Brazil. (n.d.). Food and Agriculture Organization of the United Nations. http://www.fao.org/countryprofiles/index/en/?iso3=BRA

- Fontes Filho, J. (2017). Role and limitations of NGOs in partnership with the state. Revista Estudios de Políticas Públicas, 3(1), 1-10. http://agora.edu.es/descarga/articulo/6067335.pdf
- Harlan, C. (2013, January 23). On Japan's school lunch menu: A healthy meal, made from scratch.
 Washington Postt.
 https://www.washingtonpost.com/world/on-japans-school-lunch-menu-a-healthy-meal-madefrom
 -scratch/2013/01/26/5f31d208-63a2-11e2-85f5-a8a9228e55e7
- Landmark decree ushers in a new era for school food in Brazil (2023). Advocacy Incubator, 21 Dec. 2023,https://www.advocacyincubator.org/news/2023-12-21-a-landmark-decree-ushers-in-a-new-e ra-for-school-food-in-brazil
- Liu, L. (2023). Nonprofit Law in Brazil. Council on Foundations. https://cof.org/content/nonprofit-law-brazil
- Mais, L. A., Borges, C. A., Khandpur, N., Duran, A. C., & Martins, A. P. B. (2022). Brazil's nutrition labeling regulation: Challenges ahead on the path to guaranteeing consumer's right to adequate information. Frontiers in Nutrition, 9, 921519.https://doi.org/10.3389/fnut.2022.921519
- Malleret, C. (2024, February 27). 'Fight waste to fight hunger': Food banks embrace imperfection to feed millions in Brazil. The Guardian. https://www.theguardian.com/global-development/2024/feb/27/fight-waste-to-fight-hunger-foodbanks-embrace-imperfection-to-feed-millions-in-brazil
- Marshall, E. (2024, April 4). Healthy food is hard to come by in Brazil's favelas. The Brazilian Report. https://brazilian.report/society/2024/04/04/healthy-food-hard-to-come-by-favelas/
- Mello, G. (2019, May, 17). Nestle to boost healthy food products in Brazil, eyes partnerships.Reuters.https://www.reuters.com/article/us-nestle-brazil-health-idUSKCN1SN1SU/# :~:text=Nestle%20to%20boost%20healthy%20food%20products%20in%20Brazil%2C%20eyes %20partnerships,-By%20Gabriela%20Mello&text=SAO%20PAULO%20(Reuters)%20%2D%20 Nestle,its%20food%2C%20a%20spokesman%20said.
- OECD/The World Bank. (2022). How learning continued during the COVID-19 pandemic. OECD Publishing.<u>https://www.oecd.org/en/publications/how-learning-continued-during-the-covid-19-pandemic_bbeca162-en.html</u>
- Raffrey, M. (2012). "Brazil's "ZERO HUNGER" Strategy." www.inter-reseaux.org/wp-content/uploads/Note_FaimZe_ro_Sept2012_EN_vp.pdf
- Reiher, C. (2012). Food pedagogies in Japan: From the implementation of the Basic Law on Food Education to Fukushima. Australian Journal of Adult Learning, 52(3), 507-531. https://files.eric.ed.gov/fulltext/EJ1000192.pdf

- Sidaner, E., Balaban, D., & Burlandy, L. (2013). The Brazilian school feeding programme: An example of an integrated programme in support of food and nutrition security. Public Health Nutrition, 16(6), 989-994. https://doi.org/10.1017/S1368980012005101
- Thomas, J. A. (2023, December 6). To feed its own people, Brazil embarks on long road to turn its back on intensive agriculture. Reuters. https://www.reuters.com/sustainability/feed-its-own-people-brazil-embarks-long-road-turn-its-bac k-intensive-agriculture-2023-12-07/
- Tomaz, L. A., Pereira, C. G., Braga, L. V. M., Prates, S. M. S., Silva, A. R. C. S., Soares, A. P. da C., Faria, N. C. de, & Anastácio, L. R. (2022). From the most to the least flexible nutritional profile: Classification of foods marketed in Brazil according to the Brazilian and Mexican models. Frontiers in Nutrition, 9.
 https://www.frontiersin.org/journals/nutrition/articles/10.3389/fnut.2022.919582/full
- "Toward the Human City", n.d. https://towardsthehumancity.org/initiative-19-cidade-sem-fome-saopaulo
- United States Department of Agriculture, Economic Research Service. (2022, September). Brazil's momentum as a global agricultural supplier faces headwinds. https://www.ers.usda.gov/amber-waves/2022/september/brazil-s-momentum-as-a-global-agricultu ral-supplier-faces-headwinds/
- Zeminian, L. B., Corona, L. P., da Silva, M. C., Batista, I. do N., & da Cunha, D. T. (2024). Do Primary Health Professionals in Brazil Have a Misperception about Food? The Role of Food Literacy as a Positive Predictor. Nutrients, 16(2), Article 2. https://doi.org/10.3390/nu16020302