

Destiny Nguyen

John Bowne High School

Queens, NY, USA

Vietnam, Plants

## **Plants and People: Vietnam Continues to Grow**

### **Background: Vietnam**

Vietnam, a country of 98.86 million residents, continues to develop economically and socially, while still having food insecurity. The nation made significant progress in reducing malnourishment among the population, with undernourishment at just 5% in 2021 (Maps of Vietnam | Urban vs Rural Population | Indochina Research). Unfortunately, rural communities and ethnic minorities remain deprived of adequate food supply. These difficulties result from environmental problems such as climate change and social factors, which include inequalities in resource distribution and infrastructure development. Problems such as policy and economic factors also play an important role in these difficulties, by promoting unfairness in agricultural policies in irrigation development, as well as trade agreements to increase agricultural exports without comparing both small and large-scale farmers.

Fortunately, crops that are grown for people to eat are incredibly vital in Vietnam, as they improve agricultural production on a vast scale, food production, economy, and employment. Therefore, it allows plants to become the prime factor in Vietnam's development and wealth. Through Vietnam's rich agricultural origin and various plant resources, the people of Vietnam can not only solve the problem of food security but also tackle modern environmental and social issues critical today.

Agriculture has always been essential to Vietnam's culture and economy. Approximately 39.29% of the country's land is devoted to agricultural use (Vietnam - Agricultural Land - 2022 Data 2023 Forecast 1961-2020 Historical), emphasizing the importance of farming in both rural and urban communities. Much of the lands are used for crops and gardens, which can widely vary in production and efficiency. One of the most popular grown crops in Vietnam is rice because it is versatile for many cuisines such as sticky rice and fried rice (Britannica). In addition, other cuisines involving crops include: Phở, Bánh Mì, Com Tấm, and Bánh Xèo (21 Must-Try Vietnamese Dishes). As a result, farmers commonly cultivate rice in the fertile deltas of the Red River and the Mekong River because the land is known for being highly productive, leading to high crop yields (Britannica). This provides many sources of food not only for Vietnamese families but also for many other countries through exportation. Other important crops like cassava, maize, and sweet potatoes are also considered vital in Vietnamese cuisine and culture, however, these crops are more vital in other countries' traditional dishes (Britannica).

In many countries worldwide, Vietnam is highly regarded for its agricultural production, which led the country to become an important exporter of crops such as rice, cassava, and sweet potatoes. Therefore, besides China and Mexico, Vietnam is considered the most important agricultural exporter to the United States and other nations (OEC). Furthermore, Vietnam also produces many electronics and devices, as "the top exports of Vietnam are Broadcasting Equipment (\$58.5B), Telephones (\$24.4B), Integrated Circuits (\$16.9B), Office Machine Parts (\$16.7B), and Textile Footwear (\$13.2B), exporting mostly to United States (\$117B), China (\$58.7B), South Korea (\$25.2B), Japan (\$25B), and Hong Kong (\$12.7B)" (OEC). While government investments in agricultural research have been essential in maintaining Vietnam's exportation profile. Policies after Đổi Mới in 1986 for creating new programs for training of

credit and infrastructure, was increasingly being implemented to support rural cooperatives that have been providing small-scale farmers with better access to markets and credit (Nguyen Thi). Proving that Vietnam's important role in contributing to household food security and exportation needs, reveals the importance of crops in Vietnam's economy and world crisis.

The tropical conditions and mild temperatures within Vietnam, help the country create an environment in which it is possible to grow a continuous production of a wide variety of crops (Climate Change Knowledge Portal). However, there are environmental challenges such as climate change and saltwater intrusion that are currently affecting agricultural productivity in Vietnam. These challenges include rising sea levels, changes in weather patterns, and droughts which have degraded the soil and reduced crop yields, resulting in it becoming a critical threat to food security (Asian Development Bank).

Additionally, Vietnam's average farm size is 0.74 acres per farm, which is small compared to the United States with 463 acres of farming land (Montana State University). These small plots highly limit farmers' capability to earn a significant income, as well as discourage them from adopting more expensive and productive agricultural methods to gain more crop yields. This is detrimental, as typical families in Vietnam often have smaller family sizes consisting of 3.6 people, with rural or mountain areas having the largest average household size with 3.8 people (*Press release preliminary results the 2019 Population and Housing Census*). While the government attempted to solve this issue by land initiatives to promote bigger plots, aiming to make these land more productive and resourceful for other agricultural families (Tu et al.). These families also have limited access to basic human needs such as water food, resulting in more competition for cleaner drinking water, forcing them to travel on muddy and slippery roads (News). This also forces them to travel to buy food at local wet markets for daily purchases, as they're vital for communities with limited access to modern retail infrastructure. Wet markets are usually held in larger parts of Vietnam close to roads, or near rivers. Where goods are distributed by different vendors there, usually in permanent or temporary stalls (*Vietnam wet market in rural area: Hanoi Eco Tour*). Most of the goods available for purchase include crops, food, electronics, jewelry, decorations, and etc, all of which are essential for the necessary wellbeing of Vietnamese families. In addition, employment opportunities and wages are typically low, and many of these families rely on their farms or gardens in order to supply their food sources. This difference in land acres between Vietnam and the United States, emphasizes the need for solutions and interventions to support these small farmers.

Furthermore, a mass amount of education and healthcare challenges in Vietnam still remains. Even though in recent times, Vietnam made remarkable progress in the accessibility and quality of education, it still remains a problem for children with disabilities (*Who we serve & why*). Healthcare in Vietnam is still a big issue too, as unmet healthcare needs still persist in rural areas. Approximately 18% of individuals in these areas still experience unmet healthcare needs, with barriers such as the lack of access to medicine and transportation (Kim et al.)

However, these challenges are not solely environmental, as there are social challenges in Vietnam as well. Unlike the urban communities in Vietnam, many rural communities lack access to clean drinking water, education, healthcare, and fully developed infrastructure, which makes it harder to achieve food security (Giang Thi-Huong Le et al.). Additionally, women, in particular, face significant barriers due to traditional gender roles that must be followed. Since family structures in Vietnam are mainly patriarchal, the father or eldest son serves as the primary decision-maker. It results in a highly family-oriented system in Vietnam, causing multiple generations to still reside together under one roof, as well as a strong emphasis on respect for elders and family. Even though women are the primary caregivers to their children and heavy contributors to farming activities, their children must be old enough to support them. This results in them often being heavily responsible for preparing food and maintaining household gardens or fields. However, women frequently experience limited access to resources and decision-making possibilities, deepening their vulnerability to food insecurity (Galanti).

To address Vietnam's food security challenges, many innovative solutions are needed that combine agriculture production, infrastructure development, and community empowerment.

### **Solution: Vietnam**

The best way to combat food security challenges is by combining the framework of a Climate-Resilient, Community-Driven Agricultural System (CRCDA) that allows for multiple approaches to promote food security. Instead of focusing on separate fixes throughout Vietnam, this solution integrates resilient crop breeding, agroforestry, biofortification, rural infrastructure, women's empowerment, reforestation, and better sustainable farming practices. This would address issues related to environmental, social, and economic vulnerabilities, while ensuring that Vietnam can sustainably feed its population as best as possible.

At the foundation of CRCDA is the cultivation of better resilient crops for the changing climate (Aiyana). The production of these crops will help improve food security while encouraging Vietnamese people to help mitigate the impacts of climate change. Additionally, food security would be improved through the growth of drought-tolerant and harsh weather-tolerant varieties of crops that include modified rice, cassava, maize, and sweet potatoes. These resilient crops would help farmers adapt to the changing environmental conditions, in addition to allowing them to earn a reliable income and grow sufficient food for their families. In addition, in order to make these crops more nutritious and beneficial, biofortification could be integrated because it's a solution to combat nutritional deficiencies, as it's a process that increases the nutrient content of crops. For instance, the biofortification of rice with iron and zinc can help enhance the body's immune function and reduce anemia, especially in areas that are more vulnerable to these diseases (Majumder et al.). Likewise, the introduction of new crops like moringa, a plant that is rich in vitamins and proteins, can be beneficial in reducing malnutrition (Islam et al.) This would result in not only the enhancement of the nutritional value of crops, but it would also lead to an increase in the number of crops that farmers and consumers can grow and purchase.

Furthermore, implements of organic fertilizers and crop rotation are recommended as they improve soil fertility while reducing chemical inputs. These sustainable farming methods by the CRCDA will enhance soil fertility and increase environmentally friendly consequences. As a result, all of these methods are in line with Vietnam's sustainable agricultural development goals (UNDP). Which will be regulated by the Vietnamese government, CRCDA, and research institutions.

CRCDA also transforms how farming is practiced, by promoting agroforestry, which involves integrating crops with trees. This method improves soil fertility, reduces erosion, and provides farmers additional income from producing food crops (U.S. Department of Agriculture). In Vietnam, agroforestry systems would help increase food production while helping to repair existing environmental problems such as deforestation and soil erosion. These systems also serve as mitigators against extreme weather conditions, which results in improved climate-resilient farming practices (World Bank). Additionally to trees, reforestation and improved land management practices are also important for agricultural productivity. For example, mangrove forests in coastal areas help prevent erosion, protect land that would have been touched by salt water, and offer other environmental services (van Hespden et al.). These efforts not only support agriculture production but also contribute to Vietnam's fight against environmental challenges. All of this will be supported by Vietnam's Ministry of Natural Resource and Environment and the CRCDA.

For rural areas, collaborative efforts between the CRCDA, government agencies, organizations, and local communities are critical to ensure the widespread education of biofortified crops. These government

agencies include Ministries of Agriculture and Health, school nutrition programs, and public health agencies. The organizations supporting these efforts are Food and Agriculture Organization, World Food Programme, and HarvestPlus. Then finally, local communities can include Health and Nutrition Advocacy Groups, or any local training and support groups. These campaigns can be remarkably effective for the rural population, where nutritional education is often restricted.

Investing in rural infrastructure is another critical component of CRCDA, as it emphasizes the improvement of food security in Vietnam. With more funding, better irrigation systems can be constructed to enhance water efficiency for crops, which guarantees continued crop yields during drought sessions. For instance, with improved infrastructure, dozens of Vietnamese families will be able to live without essential services years after relocation (News). In addition, improved roads and transportation networks would enable rural farmers to access urban markets more easily, allowing them to receive fair prices for their produce, thus reducing post-harvest losses (Wudad et al.). Multiple sources such as the Vietnamese Government, or Ministry of Agriculture and Rural Development, Ministry of Transport, and National Target Program on New Rural Development will help fund this. In addition to international organizations such as the World Bank, Asian Development Bank, and United Nations Development Programme. As all of these organizations will assist in improving food security.

The construction of storage facilities and bigger farmlands by the CRCDA also helps reduce losses of crops and produces more food available for consumption. Additionally, improved housing can also contribute to food security by providing farmers with better living conditions, allowing for more productive crop yield production. In which, these investments benefit producers and consumers (World Bank). These will be run by the CRCDA, Vietnamese Government, or any private Agribusinesses in order to help build and operate large storage facilities.

A critical component of CRCDA is empowering women in agriculture, as it's a key strategy for achieving sustainable food security. When women have access to education, training programs, and decision-making roles, they are more likely to adopt creative farming practices and invest in the well-being of their families. Training programs for women can enable them to manage farms more efficiently and form household income sources. These programs are run by Vietnam Women's Union and the United Nations Development Programme. And successful programs like the Women's Economic Empowerment through Agriculture Value Chain Enhancement (WEAVE) and Oxfam and the Vietnam Women's Union (VWU) both have reported improved gender equity in farming. For example, WEAVE supported ethnic minority women in northern Vietnam, successfully increasing their access to farming technology (OXFAM), while VWU was able to train thousands of women to practice agricultural techniques (T. Nyamayemombe and Naoki).

Finally, CRCDA also integrates community-based initiatives that involve local populations in decision-making processes and can also enhance the effectiveness of food security programs. These initiatives help in spreading traditional knowledge and practices, which ensure that the resolutions developed are culturally acceptable for everyone, and can be easily integrated by communities that aren't just solely in Vietnam. This will be assisted by Microfinance Institution and local programs.

### **Conclusion: Vietnam**

Overall, Vietnam's agricultural success is a clear example of how plants can help with food security and nutrition. Through investment in CRCDA, which combines climate-resilient crops, biofortification, agroforestry, and rural infrastructure, the country can develop a more sustainable and equal food system. In addition, the critical component of CRCDA of combating environmental challenges and empowering women will also help Vietnam achieve food security methods for its population.

These goals can only be attainable through collaboration among governments, organizations, and local communities, and CRCDA. In which the implementation of the solution is key to helping Vietnam use its plant resources to overcome food security challenges. This allows them to become an example to other nations with similar issues. As a result, the country's commitment to better sustainability and practices is a global model to address some of the world's most urgent challenges.

### **Works Cited**

- Aiyana. "Harvesting Resilience: The Fight for Food Security through Climate-Smart Agriculture - Global Center on Adaptation." Global Center on Adaptation, 3 Dec. 2024, <https://gca.org/harvesting-resilience-the-fight-for-food-security-through-climate-smart-agriculture/>. Accessed 23 Jan. 2025.
- Britannica. "Vietnam - Agriculture, Forestry, and Fishing | Britannica." Encyclopædia Britannica, 2019, <https://www.britannica.com/place/Vietnam/Agriculture-forestry-and-fishing>.
- Climate Change Knowledge Portal. "World Bank Climate Change Knowledge Portal." World Bank, 2021, <https://climateknowledgeportal.worldbank.org/country/vietnam/climate-data-historical>.
- Galanti, G.-A. "Vietnamese Family Relationships: A Lesson in Cross-Cultural Care." *Western Journal of Medicine*, vol. 172, no. 6, 1 June 2000, pp. 415–416, <https://doi.org/10.1136/ewjm.172.6.415>.
- Giang Thi-Huong Le, et al. "Education and Healthcare Services for Children and Young People with Intellectual Disability in Vietnam: An Ecological Systems Analysis." *Disability and Rehabilitation*, 15 Aug. 2024, pp. 1–13, <https://doi.org/10.1080/09638288.2024.2390664>. Accessed 8 Sept. 2024.
- Islam, Zahidul, et al. "Moringa Oleifera Is a Prominent Source of Nutrients with Potential Health Benefits." *International Journal of Food Science*, vol. 2021, no. 6627265, 10 Aug. 2021, p. 6627265, <https://doi.org/10.1155/2021/6627265>.
- Majumder, Shuvobrata, et al. "Rice Biofortification: High Iron, Zinc, and Vitamin-A to Fight against 'Hidden Hunger.'" *Agronomy*, vol. 9, no. 12, 25 Nov. 2019, p. 803, <https://doi.org/10.3390/agronomy9120803>.

- “Maps of Vietnam | Urban vs Rural Population | Indochina Research.” Indochina Research, 23 Aug. 2021, <https://indochina-research.com/maps-of-urban-and-rural-vietnam>. Accessed 23 Jan. 2025.
- News, Viet Nam. “Dozens of Vietnamese Families Still Living without Essential Services Years after Relocation.” Asia News Network, 2023, <https://asianews.network/dozens-of-vietnamese-families-still-living-without-essential-services-years-after-relocation/>. Accessed 23 Jan. 2025.
- Nguyen Thi, Hai Ninh. “Policies Supporting for Agricultural Cooperatives in Vietnam: An Experience from Agricultural Cooperatives in the Red River Delta.” *Technium Social Sciences Journal*, vol. 25, Nov. 2021, pp. 126–33, <https://doi.org/10.47577/tssj.v25i1.4967>. Accessed 12 Dec. 2021.
- OECD. “Vietnam (VNM) Exports, Imports, and Trade Partners.” OECD, 2022, <https://oec.world/en/profile/country/vnm>.
- OXFAM. “Women’s Economic Empowerment through Agriculture Value Chain Enhancement (WEAVE) | Oxfam in Vietnam.” *Oxfam in Vietnam*, 2016, [vietnam.oxfam.org/what-we-do-gender-equality-and-women%E2%80%99s-agency/women%E2%80%99s-economic-empowerment-through-agriculture-value](http://vietnam.oxfam.org/what-we-do-gender-equality-and-women%E2%80%99s-agency/women%E2%80%99s-economic-empowerment-through-agriculture-value).
- “Press Release Preliminary Results the 2019 Population and Housing Census.” General Statistics Office of Vietnam, <https://www.gso.gov.vn/en/data-and-statistics/2019/10/press-release-preliminary-results-the-2019-population-and-housing-census/>. Accessed 3 Feb. 2025.
- T. Nyamayemombe, Caroline, and Ito Naoki. “Building a Climate-Resilient Viet Nam: Strengthening Women’s Role in Agriculture and Leadership.” *Viet Nam*, 2025, [vietnam.un.org/en/296121-building-climate-resilient-viet-nam-strengthening-women%E2%80%99s-role-agriculture-and-leadership](http://vietnam.un.org/en/296121-building-climate-resilient-viet-nam-strengthening-women%E2%80%99s-role-agriculture-and-leadership). Accessed 2 Aug. 2025.
- Tu, Vo Hong, et al. “Land Accumulation: An Option for Improving Technical and Environmental Efficiencies of Rice Production in the Vietnamese Mekong Delta.” *Land Use Policy*, vol. 108, Sept. 2021, p. 105678, <https://doi.org/10.1016/j.landusepol.2021.105678>.

U.S. Department of Agriculture. “Agroforestry.” USDA, 11 Dec. 2024,

<https://www.usda.gov/forestry/agroforestry>.

UNDP. “Viet Nam’s Steps toward Sustainable Agriculture and Food Systems at COP28.” UNDP, 2023,

<https://www.undp.org/vietnam/news/viet-nams-steps-toward-sustainable-agriculture-and-food-systems-cop28>.

van Hespren, Rosanna, et al. “Mangrove Forests as a Nature-Based Solution for Coastal Flood Protection:

Biophysical and Ecological Considerations.” *Water Science and Engineering*, vol. 16, no. 1, 28

Oct. 2022, <https://doi.org/10.1016/j.wse.2022.10.004>.

“Vietnam - Agricultural Land (% of Land Area) - 2022 Data 2023 Forecast 1961-2020 Historical.”

Trading Economics,

<https://tradingeconomics.com/vietnam/agricultural-land-percent-of-land-area-wb-data.html>.

Viet Nam 2021-2025: Agriculture, Natural Resources and ..., Asian Development Bank,

<https://www.adb.org/sites/default/files/institutional-document/763181/viet-nam-2021-2025-agriculture-sector-assessment-strategy-road-map.pdf>. Accessed 3 Feb. 2025.

“Vietnam Wet Market in Rural Area: Hanoi Eco Tour.” Hanoi Eco Tour, 16 Aug. 2023,

<https://hanoiecotour.com/vietnam-wet-market/>.

Wudad, Abdo, et al. “The Impact of Improved Road Networks on Marketing of Vegetables and

Households’ Income in Dedo District, Oromia Regional State, Ethiopia.” *Heliyon*, vol. 7, no. 10,

1 Oct. 2021, p. e08173, <https://doi.org/10.1016/j.heliyon.2021.e08173>.

“21 Must-Try Vietnamese Dishes.” Vietnam Tourism,

<https://vietnam.travel/things-to-do/21-must-try-vietnamese-dishes>.