

Leveraging Globalization to Revive Traditional Foods

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Abstract

Traditional foods are important to the sustainability of their native regions because they are often keystone assets to food security, economic stability, and quality nutrition. Globalization of agricultural markets, changing lifestyles, and rural-to-urban migration has contributed to the gradual loss of traditional foods in developing countries. The transition from traditional foods to imported refined carbohydrates, sugars, and edible oils has promoted nutrient deficiency, economic instability, and food insecurity. While the effects of globalization have been largely negative for indigenous foods, globalization is inevitable and has potentially useful aspects. Local champions and international supporters can leverage specific technologies and market patterns brought about or influenced by globalization to revive culinary traditions, strengthen local food systems, and bolster indigenous livelihoods. Such approaches include helping farmers benefit from technological advances in efficiency and economy of scale, biotechnology, post-harvest processing, and smart infrastructure combined with ethically-conscious food sourcing. Trends such as human migration, exotic food fads, interest in nutritious and organic foods, the rise of social media, and agricultural extension and education can also support improvements in local agricultural products and their globalizing markets. Collectively, these efforts can help revive sustainable traditional food production and enhance the lives and livelihoods of indigenous communities.

Keywords: agricultural technology, globalization, indigenous foods

1. Introduction

1.1 Roles of Traditional Foods

Traditional foods can be defined as long-established, culturally important staple crops and foodstuffs. These crops are often simple to cultivate and are usually cornerstones of the native diet, providing essential proteins, vitamins, minerals, and amino acids. Their critical nutritional value has made these foods extremely important to communal and societal norms and allowed them to stand the test of time (Trichopoulou, Soukara, & Vasilopoulou, 2007). Additionally, traditional crops are often best adapted to their local environments, exhibiting tolerance to native biotic and abiotic stressors in their respective climates and conditions. Traditional foods are often important to the local economy and nutrition, providing food security, economic stability, and high nutritional quality to those that grow and/or consume them.

Despite their importance, though, traditional foods have been disappearing as a result of globalized phenomena. Different social and political movements, including colonization and the Green Revolution, have drastically changed agricultural practices by placing higher value on the production of export crops. These changes continue today with trade practices, urbanization, and global diffusion of western tastes and foodstuffs. Despite some negative consequences of globalization, the most productive and advantageous response now is to harness global trends for the revival of indigenous foods and livelihoods. Promising opportunities include those focused on improved agricultural production, post-harvest processing, and infrastructure as well as novel biotechnologies and industrial food systems. Modern technologies can improve farming efficiencies and yields, and methods such as drying and canning can protect and add value to food supplies. Global market trends also support the introduction and acceptance of indigenous crops by broader consumer populations. These trends include increasing human migration, popularity of exotic and organic foods, and prevalence of social media—all of which can facilitate the integration of indigenous foods in the global marketplace.

This article presents opportunities for leveraging globalization to revive and sustain traditional foods. It is designed to be of use to innovators and investors interested in market-based sustainable agricultural, environmental, and nutritional possibilities. This paper begins by describing the factors contributing to the disappearance of traditional foods and to the resulting problems. It then takes an example-centric approach to the discussion of how modern agricultural technologies and global markets can be leveraged to revive traditional foodstuffs.

1.2 Why Are Traditional Foods Disappearing?

Colonization and the Green Revolution (c. 1940-1960) are the two major causes of the disappearance of traditional foods. Colonizing powers focused exclusively on export crops, which led to a collapse in crop biodiversity and the loss of indigenous agricultural knowledge (Weis, 2007). Following the colonial era, the Green Revolution's singular focus on favorable environments left many resource-poor regions trapped in poverty even while overall crop production rose exponentially. For instance, innovations like high-yield variety (HYV) crops and advanced fertilizers result in much smaller yield gains in marginal farming environments than the favorable environments they were created to benefit. Fertilizer and HYV wheat can result in 40% yield gains in well-irrigated areas, whereas such investment often only brings 10% gains on more marginal farming lands (Pingali, 2012). This disparity along with high-capital foreign investment helps large commercial farms retain favorable land, displacing small-scale farmers.

From the Green Revolution on, a series of trade agreements and policies continued to foster the replacement of traditional foods with a more Westernized diet. Today, farmers around the world are moving toward a more commercialized, industrialized, and foreign-driven agricultural system. Instead of focusing on the growth and production of native food crops, developing nations around the world have prioritized cash crops intended for export. Additionally, at least 19 countries are using significant land resources to produce biofuels, further limiting indigenous foods production (Motes, 2010). In addition to these land use and economic changes, urbanization has also affected the production of indigenous crops. The movement away from the traditional croplands has disconnected city-dwellers from native agriculture while promoting a more westernized diet and raising the demand for related crops.

1.3 Why Should We Care about the Disappearance of Traditional Foods?

The disappearance of traditional foods has led to nutrition deficiency in some of their origin countries. The current agricultural system makes refined carbohydrates such as refined wheat, rice, sugar, and edible oils more readily available and affordable than traditional food products. Although these carbohydrates and edible oils are allowing people to become more energy secure (Johns & Sthapit, 2004) they are also displacing nutritious beans, legumes, fruits, and vegetables. Additionally, due to various global tariffs and agricultural subsidies, it has become cheaper to purchase imported "junk food" than to purchase nutritious domestic produce. This diet transition is contributing to the rise of type 2 diabetes, cardiovascular disease, obesity, and other chronic noncommunicable diseases (Johns & Sthapit, 2004).

In addition to the health risks, the loss of biodiversity hinders ecological systems and puts farmers in precarious situations. When plants are all of the same variety, there is a much greater risk of losing the entire monoculture to pests, diseases, or drought. Climate change may also cause many agricultural challenges, such as the rise in extreme precipitation events like droughts and hurricanes. Developing countries are predicted to bear the brunt of most of the problems caused by climate change, and it is also speculated that climate change will widen the gap in cereal production between developed and developing countries (Keane, Page, Kergna, & Kennan, 2009). In order to address these challenges, it is important to grow traditional crops and provide crucial biodiversity.

2. Leveraging Modern Technology to Revive Traditional Foods

Globalization has contributed to the disappearance of indigenous foods, but modern agricultural technologies supported by globalization have the potential to bring them back. Technological innovations present a plethora of new opportunities to address nutrition poverty in the developing world. With the multi-faceted problems of malnutrition and environmental degradation, it is necessary to parse through the various agricultural technologies and identify ones that are economically appropriate as well as sustainable and efficient. Strengthening food value chains (FVCs) with agricultural technologies can reduce food spoilage as well as improve the efficiency and yield of farmland. The types of technologies shown in Figure 1 can strengthen each of the six FVC phases: production, processing, storage, marketing, distribution, and consumption (Callan, Sundin, Suffian, & Mehta, 2014).

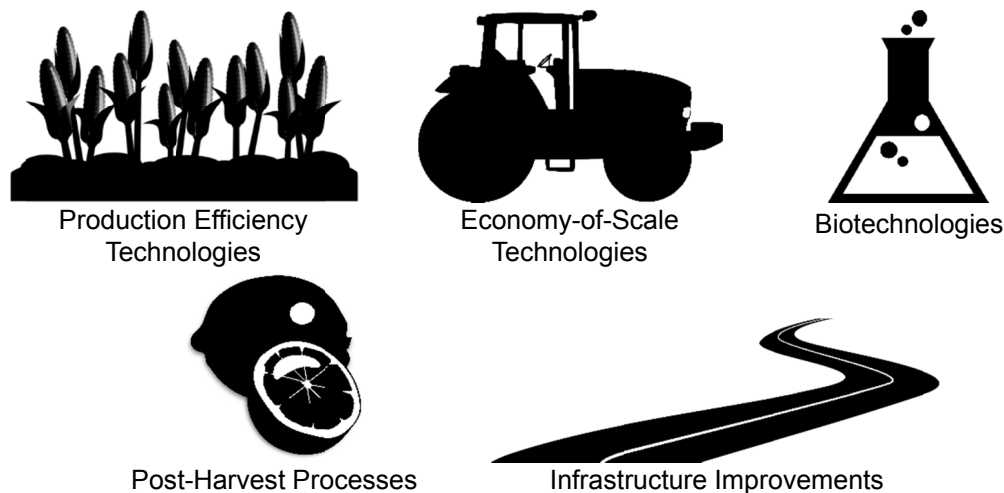


Figure 1. Types of agricultural technologies that can be leveraged to revive traditional foods

2.1 Production Efficiency Technologies

Modern agricultural technologies, including advanced insecticides, improved plant varieties, and more efficient planting tools, can and have improved the efficiencies of small-scale farming operations. For instance, greenhouses have enhanced agricultural production by allowing for year-round crop growth. Use of these structures allows farmers in a variety of climates to increase their revenues by thousands of dollars per year. Until recently, however, greenhouses were not an economically viable option for small-scale farmers in the developing world. Novel affordable greenhouses provide the opportunity to grow traditional foods, thereby improving the local economy (Suffian, De Reus, Eckard, Copley, & Mehta, 2013).

One example of a nutritional benefit is amaranth, a vegetable indigenous to Africa that grows in humid, tropical environments. Amaranth leaves provide a significant number of Africans with as much as 25% of their daily protein as well as significant quantities of vitamins A and C, calcium, and iron (National Research Council, 2006). Greenhouses can extend the growing season by providing the necessary humid environment, making this crop available more frequently.

2.2 Production Economy-of-Scale Technologies

While commercial agricultural technologies are not directly accessible or beneficial to smallholder farmers, they are still key aspects of many agricultural systems. Large economy-of-scale technologies are likely to extend further into developing markets with any increase in crop demand. Though commercial farming can create detrimental competition for smallholders, large-scale technologies can also help underdeveloped economies leverage industrialized efficiencies and develop transportation infrastructure. Economies of scale can also help revive some traditional foods that might not otherwise gain market penetration. The important caveat is that both foreign and domestic markets practice ethical sourcing and consumption.

For example, teff is a grain harvested in Ethiopia and is used in the indigenous dish injera. Injera is a spongy flatbread that is widely consumed across Ethiopia as an inexpensive traditional addition to nearly all meals. Teff is a reliable and resilient crop, often found free of pests and disease and able to survive unfavorable weather conditions (Hrušková, Švec, & Jurinová, 2012). However, it is difficult to sow efficiently and generally has low yields and slow harvests. These difficulties limit its popularity among farmers, and many Ethiopians have replaced it with wheat or other grains. Modern seed dispersal units could make planting and harvesting teff easier and more productive, thus lowering its price and making it available to a larger market. Adopting this large-scale production technology could help revive the traditional Ethiopian staple, benefitting consumers and communities and potentially leading to innovations for smallholders.

2.3 Biotechnologies

Biotechnology, though controversial, has resulted in large gains for both small-scale and large-scale farmers around the world. Bioengineered seeds in particular have made farming more environmentally friendly and economically efficient due to their increased resistance to pests, disease, and unfavorable climate conditions.

Insect resistance has greatly improved the production of soybeans, corn, cotton, and canola seeds worldwide (Motes, 2010). Further research can and is developing similar improvements for other crops, including sorghum (Kumar, et al., 2011) and potentially millet. However, it is important to note that the use of biotechnology has raised many ethical and practical questions, such as if consuming artificially altered foods will lead to health problems in the future.

Other crops are also promising candidates for biotechnology research. Cowpeas are a grain legume with quality amino acid, vitamin, mineral, and protein content. The crop can resist drought, grows well in soils of poor quality, and provides many of the nutrients missing from African diets (National Research Council, 2006). However, an insect pest known as Maruca pod borer can easily destroy this crop and all other African grain legumes. Farmers can face up to a 100% crop failure during serious attacks (Machuka, 2001). Biotechnology research may be able to create pest-resistant varieties of the cowpea and other grain legumes.

2.4 Post-Harvest Processing Technologies

Significant loss of agricultural productivity also occurs after the harvest. Lack of post-harvest protection is a larger problem for fruits and vegetables, as their sale price is largely dependent on their physical appearance. Pests and pathogens degrade produce appearance, forcing down their market price, which encourages farmers to switch to crops with more consistent selling prices. Post-harvest technologies, such as food dehydrators, can improve storage and marketability.

The longan fruit is an example of an indigenous crop with a great market potential that is not currently being realized (Jiang, Zhang, Joyce, & Ketsa, 2002). This fruit is native to areas of northern Burma and southern China. At ambient temperatures, the post-harvest life of the longan fruit is very short, about 3 or 4 days. However, its shelf life can be extended by canning, freezing, or drying the fruit or by utilizing preservation technologies such as fungicide dips and sulfur fumigation (Jiang, Zhang, Joyce, & Ketsa, 2002). There is a strong market in Asia for the dried fruit in particular, and canning retains much of the fruit's flavor (Jiang, Zhang, Joyce, & Ketsa, 2002).

2.5 Infrastructure Improvements

Transportation and infrastructure are generally expensive and inconsistent in rural areas of developing countries, while urban areas take advantage of better infrastructure to facilitate importation into their larger shipping hubs. However, construction of hard infrastructure like paved roads is connecting rural areas of developing countries to the rest of the world at unprecedented speeds. The global spread of communications technologies are also allowing isolated communities to join global markets and networks with greater ease than ever before (Kramer, Urquhart, & Schmitt, 2009). Development initiatives that improve transportation, electricity, and water access can connect farmers to new markets.

Improved infrastructure could directly improve the sale of the butterfruit, a well-known and popular fruit in Central and West Africa (National Research Council, 2008). Its pulp packs high nutritional content including protein, energy, and amino acids. It also combats micronutrient deficiencies by providing phosphorus, potassium, calcium, and magnesium (National Research Council, 2008). In the areas of high heat and humidity where the butterfruit is grown, its shelf life can be only a week or less. Better infrastructure can help get the fruit to market sooner, making it a more viable and attractive crop for consumers and farmers alike.

3. Leveraging Globalized Markets to Revive Traditional Foods

Increasing migration, trade, and communication trends in the global society can be advantageously leveraged to revive traditional foods. Human migration spreads knowledge, customs, and cultures in ways that can also promote the spread of traditional foods. Trends in the global market such as exotic food fads and the growing demand for nutritious and organic foods open niches for traditional crops in entirely new locations. As summarized in Figure 2, unprecedented methods and rates of worldwide communication create many novel opportunities to spread awareness, knowledge, and education pertaining to traditional foods and agricultural systems.

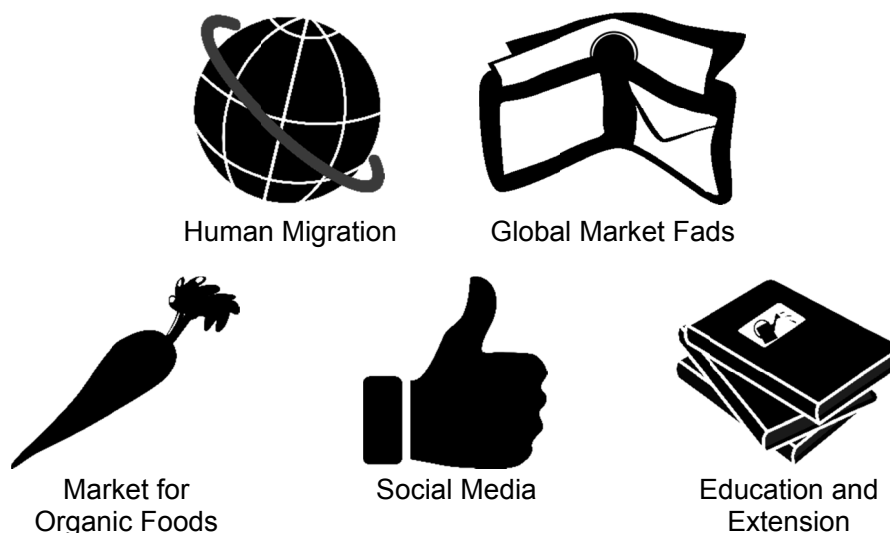


Figure 2. Ways in which globalized interaction can be leveraged to revive traditional foods

3.1 Human Migration

Heavy human migration from rural areas to urban centers as well as from developing to developed countries is occurring globally. As people travel, some traditional foods travel with them. For instance, as migration from African countries has increased, exports from Africa have as well (Willer & Lernoud, 2014). This rise in exports can benefit smallholder farmers if new technologies allow them to price their crops competitively in the global market.

An example of a traditional African crop that traveled out of Africa with modern globalization is sorghum, the second most important cereal crop in Africa. Sorghum is incredibly versatile: indigenous uses include being cooked like rice or made into porridge, beer, flatbreads, or popcorn. It has now been adopted and adapted in Latin America, specifically in Mexico, where it has a new role primarily as animal feed (Stone, et al., 2011). The demand for sorghum as an ingredient in beer, instant porridge, and vegetable oil is also growing. Sorghum's use in adhesives, waxes, and dyes provides other markets for farmers to leverage. Beyond sorghum, countless additional crops have also spread globally and expanded both their indigenous and other uses. Another native African, yam, is already well known beyond Ghana, but has still seen in a modern rise in production and export, from a total production of 877,000 tons in 1990 to 5,960,490 tons in 2010. Smallholder farmers are the main drivers behind this production jump (Anaadumba, 2013).

3.2 Global Market Fads for Exotic Foods

Changes in food consumption usually occur because of lifestyle changes surrounding income, urbanization, demographics, transportation, and quality and safety perceptions (Regmi, 2001). When people generate larger incomes, they desire diets that are more expensive. Globally, this trend results in a booming demand for exotic foods. Developed countries in particular are catalysts of these exotic food fads. Wealthier people living in developed countries are the quickest to join the newest global trends, such as the fad of the paleo and gluten-free diets. These diets use ancient grains like quinoa and chia that were once very popular in their native countries but were overshadowed by modern grains and cereals. These trends spur rapid increases in associated product launches. For instance, launches of foods labeled 'Japanese' grew 230% from just 2009 to 2010 and 'Thai' grew 68% (Mintel, 2011). While this sort of growth is certainly not sustainable long-term, it points to clear untapped niches in the ethnic food markets.

As mentioned, quinoa is an example of an exotic food that has quickly risen in popularity in a new major niche market. Quinoa is native to Bolivia, Chile, and the Peruvian Andes (Oelke, Putnam, Teynor, & Oplinger, 1992). The initial takeover of western crops and foods in these regions led to the marginalization of quinoa, but now western markets offer it the chance of revival. The grain is highly nutritious, with strong protein content and all nine essential amino acids. Consumers have also sparked a new wave of food products releases: up by nearly 50% in 2013 (Schroeder, 2013).

Other traditional foods from around the world have received the “trendy” label. For instance, chia is native to both Mexico and Bolivia, but is becoming a popular product in developed countries for weight loss. It is rich in omega-3 fatty acids, antioxidants, and fiber. Chia, like quinoa, saw an increase in 2013 product launches—again about a 50% increase worldwide. In fact, nearly half of the demand for chia has come from the United States and not South America due largely to weight-loss fads in the United States (Schroeder, 2013).

Perhaps the strongest evidence of demand for these traditional crops, however, is the strength of the negative impact some have on their native locales. The social movement for ethically conscious sourcing has not been able to keep pace with the surges in market demand, leading to a number of problems for smallholder farmers and their environments. For instance, quinoa is now so expensive in its traditional croplands that many locals must turn to cheaper imported junk food (Collins, 2013). Environmentally, irrigation of asparagus destined for international markets is depleting Peruvian water resources (Lawrence, 2010). In Brazil, increased soya production and displaced ranching operations are leading to increased deforestation (Barona, Ramankutty, Hyman, & Coomes, 2010). Sustainable development efforts must drive interest and investment in ethically-conscious sourcing simultaneous with efforts at market penetration in order to ensure benefit to smallholder farmers, indigenous nutrition, and local environments.

3.3 Growing Market for Nutritious and Organic Foods

The global market for nutritious and organic foods has boomed in recent years. In the United States alone, the market for organic foods grew from \$3.6 billion in 1997 to \$21.1 billion in 2008 (Dimitri & Oberholtzer, 2009). Even toward the end of that decade, the industry still saw a 50% increase in producers from 2006 to 2008 (Willer & Lernoud, 2014).

Developing countries have become increasingly involved in organic agriculture. As of 2012, Africa has over one million hectares devoted to organic agriculture and Asia has three million, both up from zero in 1999. Latin America saw a similarly strong increase, 6.8 million up from 1.2 million in 1999, and Oceania went from 3.7 to 11.2 million over the same period (Willer & Lernoud, 2014). In particular, developing countries that are former E.U. colonies with good market ties to Europe can and do benefit from organic exporting (Kim, 2013). This shows that although the demand for nutritious and organic foods is much higher in developed countries, smallholder farmers in developing countries can leverage this market if enabled by efficiency and transport technologies and ethical sourcing. In addition, organic farming tends to improve the biodiversity and sustainability of farming practices in rural communities (Maeder, Dubois, Gunst, Fried, & Niggli, 2002).

One of the first crops domesticated by man, flax, is an example of one whose sales have seen enormous growth due to global demand (Goyal, Sharma, Upadhyay, Gill, & Sihag, 2014). Although it was originally grown in African and Asian locations, the crop has spread worldwide. In the United States today, flax and flaxseed are in high demand. Flaxseed in particular has been promoted for its low calorie and high fiber and omega-3 fatty acid content (Goyal, Sharma, Upadhyay, Gill, & Sihag, 2014). With the right support and technology, sustainable farmers in native flaxseed locations such as Egypt and China can leverage this large global market.

3.4 Social Media

The rise of social media has provided consumers with easy, unfettered access to recipes for traditional meals, advice on where to find ingredients, and tips for food preparation. Searching for ‘traditional foods’ or ‘indigenous foods’ on the popular media sharing site Pinterest produces a wide variety of resources. Through this social media website, the common user can discover links leading to websites about foods from places as diverse as the Pacific Islands, Chile, India, and Australia. The ease of cultural knowledge flow over the internet has made traditional foods more accessible to consumers around the globe. This effect is likely to increase through subsequent generations.

The spiky, unusual appearance of the horned melon, or kiwano, has made it the focus of prominent social media coverage. Its distinct look has helped promote worldwide sales even more so than its taste or nutritional qualities (National Research Council, 2008). Many social media users also like to boast in the captions and comments of their pictures that their horned melon was cut and opened in the traditional fashion, a trend that further extends its reach. Performing a search for the fruit on the popular photo-sharing platform Instagram reveals 8,222 posts containing the hashtag “kiwano,” and 3,864 posts containing the hashtag “hornedmelon”. Through careful understanding of how information spreads through these platforms, increasingly connected smallholder farmers can promote their own crops and thereby increase sales in the global market.

3.5 Improved Education and Extension

‘Soft’ infrastructure systems include all of the nonphysical, organizational institutions established for a society to

function. Some of these systems, such as global communication channels, can be harnessed to educate smallholder farmers in rural areas. Extension programs can enhance and broaden farmers' skills and familiarize them with agricultural technologies that can help revive traditional crops (Elias, Nohmi, Yasunobu, & Ishida, 2013). Knowledge areas include farm management practices, appropriate agricultural technology, and nutrient maintenance (Elias, Nohmi, Yasunobu, & Ishida, 2013). These tools can help small-scale farmers handle problems associated with reintroduced indigenous crops. Additionally, enhanced knowledge transfer can help with market timing, allowing farmers to achieve the highest sale price when faced with fluctuating demand.

The bambara bean is an example crop that educated farmers could use to increase the overall quality of their soil. A type of peanut native Africa and exported primarily by Gulf of Guinea countries, the bambara bean is a nutritious, low-growing legume that improves soil fertility and is inexpensive to grow in diverse and difficult environmental conditions (National Research Council, 2006). Education can encourage farmers to diversify their crop rotations to include legumes like the bambara bean in order to revive the crop while simultaneously adding nutrients to their soils.

4. Conclusion

Globalization creates opportunities for both the disappearance and revival of traditional foods. Often the most appropriate and resilient options in their native environments, indigenous crops tie people to their respective societies and cultures. Highly nutritious traditional foods offer many possibilities to promote greater food security and economic advancement for smallholder farmers in developing countries, especially by opening up global niche markets.

Leveraging technology pushes and market pulls along with ethical sourcing can bring about traditional food revival and benefit underserved agricultural economies. Modern agricultural technologies provide the opportunity for more efficient and better quality production that can add value to food products and increase their shelf life. Global market trends have the capability to spread nutritious and organic indigenous foods to a worldwide audience. Government investment in improved infrastructure and outreach programs could give farmers access both to new markets and to knowledge needed to take advantage of global market trends. Additionally, global consumer support of traditional foods can increase the incomes of smallholder farmers in developing countries. The revival and preservation of indigenous crops and foods are extremely important for ecological, food security, health, economic and societal reasons in a globalized world.

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