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Reviving Yemen's Agricultural Sector: Counteracting Khat Cultivation and Improving Coffee Trade for Sustainable Economic Development

Yemen's Economic and Humanitarian Crisis

Since 2014, a civil war has torn apart the Republic of Yemen, crippling food production within the country and causing a devastating economic crisis. About half of Yemen's total population of 34.4 million people suffer from malnutrition ("Yemen: Fighting"). Moreover, four of five Yemeni citizens live under the poverty line ("Yemen on the Brink"). Based on a survey in 2023, 65% of Yemeni households reported not having enough money to cover basic needs (ACAPS et al. 3). The first step to addressing food insecurity in Yemen must be reviving the economy to increase incomes, enhance access to food, and improve Yemeni livelihoods. To accomplish this, Yemen's agricultural focus needs to shift toward cultivating coffee as a regional and international export.

The typical Yemen household consists of three to four children living with parents, grandparents, aunts, and uncles ("Yemen" [AFS-USA]). In nearly 70% of these households, only one member is receiving an income (ACAPS et al. 3). Approximately one-third of these family units do not fulfill their dietary needs and often have little or no access to essential foods such as dairy, meat, fruits, and vegetables ("Yemen Emergency").

Education centers and healthcare facilities are unable to provide adequate services due to long-lasting power outages and underdeveloped roads ("Finding Light"; Coombs and Salah). Yemen has a 17.22% unemployment rate and just over 80% of the population lives below the poverty line because infrastructure and economic institutions were ruined by ongoing civil war ("Yemen" [CIA]; "Yemen on the Brink").

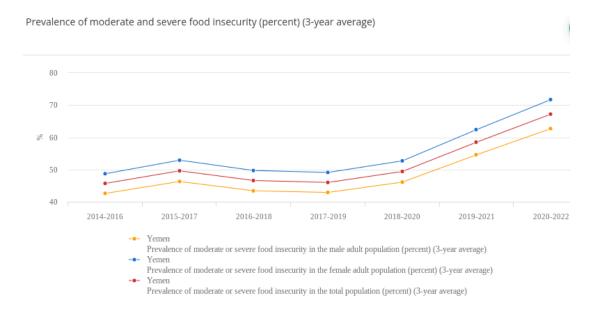
In Yemen, 30% of the national workforce is in the agricultural sector, yet locally produced food only contributes to 17% of Yemeni daily calorie consumption (ACAPS et al. 12). The population's reliance on imported food reflects this inadequate food production as 70% of the food by volume in Yemen is imported (ACAPS et al. 3). 62% of farms in Yemen cover less than five acres ("Yemen" [USAID]).

Impact of the Civil War

The civil war in Yemen began in September 2014 when Houthi rebels took control of Yemen's capital city, Sanaa, demanding the creation of a new government ("War in Yemen"). In January 2015, rebels gained control of the presidential palace, causing President Abd Rabbu Mansour Hadi to flee the country and temporarily resign before resuming his duties from a location outside the country ("War in Yemen"). Since then, war has continued as Houthi rebels attempt to eradicate the internationally recognized government of Yemen ("War in Yemen").

This conflict has caused a humanitarian crisis for the Yemeni population; 17 million people are food insecure and 21.6 million people require humanitarian aid as of 2024 ("Yemen Emergency"). According to a 2021 United Nations Development Programme (UNDP) report, nearly 60% of the 400,000 deaths reported were caused by malnutrition and lack of access to healthcare resulting from ongoing conflict (Hanna et al. 12). The war has caused significant damage to infrastructure and the economic situation within the country is dire. Since the beginning of the conflict in 2015, Yemen's economy has halved and, currently, Yemen is one of the poorest countries in the Middle East and North Africa region ("Yemen on

the Brink"; "Yemen: Fighting"). Women and children are the most affected by food insecurity, as 3.5 million pregnant or breastfeeding women and children under five are suffering from acute malnutrition ("Yemen Emergency"). The continuation of conflict means that the entire country suffers from a lack of stability; this is the main source of current issues within Yemen relating to food and economic insecurity. According to FAOSTAT's food insecurity trends, suffering will worsen for Yemeni people, as the prevalence of severe food insecurity has been increasing from 2017-2022 (Prevalence of Severe).



(Prevalence of Severe)

In the face of Yemen's humanitarian needs, organizations such as the World Food Programme (WFP) provide increased access to food and other aid to suffering Yemeni families. The WFP is using several methods to address the challenge of food insecurity such as targeting the Yemen population that is most in need, providing nutritional support for pregnant or breastfeeding women, and supplying food to children in schools ("Yemen Emergency"). In areas where the markets are stable enough, cash assistance is provided so food can be bought locally and the economy can be boosted ("Yemen Emergency").

However, despite the work of the WFP contributing to the avoidance of famine in Yemen, the organization is not receiving enough funding to continue its efforts at the same scale as before ("Yemen: Fighting"). Lack of funding is resulting in a 30% decrease in the number of people served by the WFP within Yemen, meaning that only 6.5 million of the prior 9.5 million are receiving the same level of aid ("WFP pauses"). The WFP projects that millions of people are in danger of starvation and preventable death because of loss of access to important supplies and, more importantly, food ("Yemen: Fighting").

Agricultural History

In the roots of Yemen's agricultural sector, a secondary conflict has been brewing for hundreds of years between Yemen's most lucrative cash crops - khat (qat) and coffee. Khat is an addictive narcotic originating in Ethiopia that was brought to Yemen in the early 14th century (Kasinof). For years, khat was considered a luxury and its consumption was limited to elites (Kasinof). Coffee, another plant indigenous to Ethiopia, was brought to Yemen about a decade and a half later than khat, around 1450 (Greeney 1).

In 1544, efforts were focused on coffee production rather than qat cultivation (Brooks). In the following 250 years, Yemen produced 100% of the world's coffee, appealing to the growing demand for the beverage (Greeney 1). Yemen lost this monopoly around the turn of the 18th century, perhaps caused by the Ottomans leaving coffee seeds behind when they retreated from Vienna in 1683 (Brooks). European countries disrupted these seeds to colonies worldwide, using cheap labor to quickly dominate the coffee industry (Brooks). By 1840 Yemen only produced around 2-3% of the global coffee supply (Greeney 1).

Economic and socio-cultural shifts following the Ottoman Turk's withdrawal from Yemen in 1918 expanded khat cultivation and allowed the non-elite population to increase consumption (Elie 5). With Yemen's coffee trade diminishing, the Imam encouraged large landowners to replace coffee crops with khat (Elie 6). Between 1935 and 1949, Yemen's khat exports increased by 75% (Elie 6). A World Bank estimate from 2000 found that khat accounted for around 30% of Yemen's economy (Al-Najjar et al. 13).

The prioritization of khat over coffee production began long before the conflict; however, the conflict has only worsened the issue. The civil war increased the number of farmers reliant on producing khat by compounding existing economic struggles while limiting other opportunities with a developmental standstill. Since the war began nearly a decade ago, khat production in Yemen has been increasing annually by approximately 12% (Al-Najjar et al. 11).

Today, as khat production sores, Yemen produces less than 1% of the global coffee supply (Greeney 1). Around 15% of Yemen's agricultural land is dedicated to khat cultivation, yielding 190 thousand tons annually (Khan and Al-Kirshi 49). In contrast, coffee production occupies just over 3% of arable land, with an average of 24 thousand tons of coffee yielded annually between 2010 and 2020 ("Arable Land"; Al-Najjar et al. 10).

Drawbacks of Khat

Khat consumption is widely accepted in Yemeni society, with 70% of the population regularly consuming the drug (Al-Najjar et al. 11). Khat usage is common in nearly every social activity, the stimulating properties giving users more energy to engage in group discussions, followed by a calmative effect for sleep (El-Menyar et al.). However, khat is not merely a harmless stimulant. According to the World Health Organization, khat is a drug of abuse (El-Menyar et al.). Cathinone - one of the main chemical components of khat - is classified as a Schedule 1 narcotic in the United States (El-Menyar et al.). Addiction to khat is deepening families' financial distress; in 2013, about 20% of Yemeni families were in debt from spending on the drug (Kasinof).

This widespread addiction has far-reaching effects on society and the economy. Working hours are from 8 am to 2 pm so workers can consume khat in the afternoon, 90% of adult males chew for three to four hours daily (Kasinof; El-Menyar et al.). This limits societal productivity leading to a stagnation in economic progress. Furthermore, agricultural productivity has decreased because farmers are incentivized to produce khat instead of food crops. For example, Yemeni wheat farmers are unable to compete with the lower pieces of imported wheat, making the product unaffordable to locals and decreasing the farmer's income (ACAPS et al. 3). For this reason, many farmers once growing food crops have transitioned to khat for higher incomes.

At the root of the food insecurity crisis in Yemen, the corrupt khat industry feeds off of people's desperation. Whether it be the farmer, trying to turn the most profit to put food on the table; or the consumer, using khat to connect with others and escape from the seemingly endless wartime. As Yemen's Minister of Culture stated in 1999, "The problem of qat corrupts the minds of the Yemeni people. It has affected our progress... By overcoming this disease, we rescue the Yemeni people from shame and deterioration... and add national glory to the 21st century" (Elie 23).

Benefits of Coffee

Coffee, once a staple of Yemen's flourishing trade, has the potential to lead the country to a more sustainable future. Increased cultivation and exportation of coffee would nourish Yemen's broken economy and counteract the negative implications of khat cultivation that plague the nation. Yemeni coffee is highly sought after regionally and internationally, and increased cultivation would increase trade opportunities for Yemen.

There is high demand for Yemeni coffee in the specialty coffee market because it is globally renowned for its rich, unique flavor profile (Roche and McCarthy). There is a lucrative global market for specialty coffee, in 2022 the market was valued at USD 27 billion with an expected annual growth rate of 11.8% from 2023 to 2032 ("Global Specialty"). Yemeni coffee can capture a premium price in this thriving market, resulting in improved revenue that could help stabilize the nation's economy.

Additionally, coffee has a much longer storage period than khat; khat leaves begin to deteriorate 48 hours after harvest, compared to coffee beans that can be stored for upwards of a year (National Drug Intelligence Center; Roche and McCarthy). This difference in the crops makes an impactful shift for farmers, allowing them to keep stores of coffee that they can tap into during financial hardship (Roche and McCarthy).

Coffee has the potential to create more equitable economic opportunities compared to khat. Smallholder farmers typically own coffee farms; the average farm size is just over 0.7 acres and with an average annual production of about 250 pounds of coffee (Al-Najjar et al. 10). Improving the coffee supply chain in Yemen can help to increase income for these small coffee farmers. Conversely, evidence from a 2008 study shows that 64% of khat farms were owned by just 9% of farmers (Kasinof). This farming elite, also known as the khat lobby, capitalizes on the nation's addiction and uses political influence to lobby the government to allow the production of the drug to continue (Kasinof).

Challenges Replacing Khat with Coffee

Yemen's complex social, political, and economic landscapes present several challenges around replacing khat production with coffee cultivation. However, overcoming these challenges is necessary for Yemen's economy to reap the benefits of coffee as an export.

Despite its potential, Yemeni coffee needs improvement in quality and yield, which are critical to meeting international standards and demand. Yemen's coffee yields are much lower than other coffee-producing countries; in 2020, Yemen had a yield of 0.6 tonnes per hectare compared to Colombia's yield of 1 tonne per hectare (Al-Najjar et al. 10). Many farmers still rely on traditional practices that limit both the quantity and the consistency of produced coffee. The long history of Yemen's coffee industry provides the crop with a cultural significance, however, this cultural significance can be retained while promoting updated farming practices to improve yield sizes and quality.

Khat's extensive socio-cultural impacts in Yemen make it a multifaceted issue, and the biggest challenge facing a transition to coffee production. The nation's addiction to khat makes it very difficult to uproot the crop. Yemen's current annual spending on khat is as high as \$12 billion, with some families allocating as much as 50% of their income to uphold their khat consumption (Khan and Al-Kirshi 49; ACAPS et al. 25).

In 2016, The Yemeni government attempted a ban on the sale of khat on weekdays in the city of Aden; however, the effectiveness of this ban remains unclear (MEE Correspondent). Initially, many residents struggled with withdrawal symptoms, while others supported the ban due to the potential social and economic benefits (MEE Correspondent). There has been limited news on Aden's khat ban since its implementation; yet, it seems the enforcement has been lacking control, with some areas struggling with

smuggling, bribery, and residents bypassing the ban by buying khat from nearby provinces (MEE Correspondent).

The second aspect of the khat problem is that local consumption and extensive supply networks make it the most lucrative crop for small farmers, especially in Yemen's current political and economic climate. In the face of trade restrictions, damaged infrastructure, and lack of investment in coffee farming, khat has become a profitable cash crop for suffering farmers during the conflict. Blockades on Yemen's air and sea ports limit coffee export potential but create a thriving domestic khat supply chain (Feierstein 10). Additionally, the poor state of Yemeni road infrastructure amid the war makes it extremely difficult for farmers to personally transport crops, especially in rural areas where coffee growing thrives (Coombs and Salah). For this reason, khat farmers typically sell their products to a middleman, who then disrupts the product to wholesalers and retailers (Khan and Al-Kirshi 56). This process results in 97% of cultivated khat being consumed locally, allowing farmers to maintain a relatively stable daily income, depending on the season (Khan and Al-Kirshi 49; Kasinof).

Proposed Solutions to Overcome Challenges

One way to improve the quality and yield of coffee produced by Yemeni farmers is to offer educational initiatives that teach modern agricultural techniques. Specific areas to address include general modern farm management, pruning, fertilization, and post-harvest handling (Al-Najjar et al. 32). The USAID Yemen Economic Stabilization and Success (YESS) program has demonstrated the effectiveness of such training. YESS has worked with about 800 farmers in Yemen to enhance their coffee yield and profitability ("Hameed's Harvest"). For example, Hameed, a farmer in the Sana'a Governorate, benefited significantly from adopting harvest and post-harvest practices introduced to him by YESS ("Hameed's Harvest"). As a result, Hammed saw a 10% increase in yield and earned 2.5 times more per kilogram of coffee due to improved quality ("Hameed's Harvest"). As of 2020-2021, coffee accounts for just 1.38% of Yemen's total exports, amounting to USD 20 million (Khan and Al-Kirshi 7). If 90,000 small-scale coffee farmers in Yemen receive the same training as Hameed and experience the same yield and profit increases, Yemen's coffee sector can grow as much as 170%, to just under \$70 million.

A strategy combining education on khat's drawbacks and rehabilitation support is essential to release Yemen from khat's cultural chokehold. Thailand's campaign against methamphetamines shifted their reaction from punishment to treatment, making harm reduction an important goal ("Thailand: Moving"). A similar approach in Yemen to help khat users effectively remove the drug from daily habit would be more successful than the outright ban attempted in Aden. This rehabilitation approach complemented by a strong focus on reducing demand for khat through education about the social, economic, and health dangers of khat consumption would work to reduce the drug's impact. These education incentives should target the youth, to reduce future demand for the drug, with 15-20% of children under 12 being daily consumers (El-Menyar et al.). On top of this, strict regulations to discourage khat usage among children should be implemented to reduce generational impact.

To make coffee a viable alternative to khat, it is crucial to enhance the coffee supply chain through targeted infrastructure improvements and market access initiatives. Given the current challenges, such as the extensive khat supply chain networks and trade restrictions that limit coffee exports, efforts to uplift the coffee sector must include comprehensive support measures. Expanding successful initiatives such as coffee nurseries in key coffee-growing regions, which provide coffee seedlings at a minimal cost, could act to reduce farmers' input investments and encourage coffee cultivation (Khan and Al-Kirshi 19). Drawing from Columbia's approach to reducing coca cultivation through combined governmental and international support - which successfully reduced the land area dedicated to coca production by a quarter between 2011 and 2012 - Yemen could similarly benefit from a structured supportive strategy to transition from khat to coffee ("Columbia: Alternative").

Moreover, an important factor in maximizing the profitability of coffee for Yemeni farmers is to improve access to international and regional markets. With a high global demand for specialty coffee, Yemen must overcome export barriers caused by ongoing conflicts to capitalize. Securing a ceasefire to relieve blockades on airports and ports, as attempted in the 2018 Stockholm Agreement, is essential for restoring trade routes and enabling Yemeni coffee to reach global markets ("Brokering a Ceasefire"). In areas that are controlled by the Saudi-backed Yemeni government, supporting and expanding trade routes to Saudi Arabia could begin to open Yemeni coffee up to international markets, facilitating a more reliable coffee supply chain.

Conclusion

Yemen's dire economic, humanitarian, and food insecurity crisis demands a shift from khat to coffee cultivation. By revitalizing coffee production, Yemen can harness its potential as a high-demand specialty crop to boost economic growth, improve the population's access to food, and reduce dependence on khat. The complexity of Yemen's historical and current situations means that several strategies need to be implemented to effectively uproot khat. Enhancing coffee supply chains through infrastructure development, support initiatives for transitioning farmers, and increasing access to regional and international markets are essential for Yemeni farmers to receive higher income opportunities from coffee cultivation. Additionally, addressing khat's deep-rooted socio-cultural impacts through targeted education and rehabilitation programs will be crucial. Combining these efforts offers a promising future where Yemeni livelihoods are improved and supported by a stable and sustainable agricultural sector.

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