

Keo Corak  
Leesville Road High School  
Raleigh, NC  
Yemen, Factor 9

### **Qat: A Challenge to Sustainable Agriculture in Yemen**

A discussion of Yemeni agriculture is synonymous with a discussion of qat. Qat (*Catha edulis*) is an herbaceous shrub, the fresh leaves of which produce a mild narcotic effect when chewed. Its use is widely accepted and practiced in Yemen. In the last thirty years, demand for qat has exploded. This, when combined with unregulated (and in some cases subsidized) well expansion for irrigation has strained the already tenuous water supply in central Yemen. Water extraction exceeds recharge by up to 400%. Ways in which to reduce waste of this precious resource are well know. Yet for Yemen, simple implementation of these techniques is difficult. Current production methods are far too entrenched for that. First there must be the will to change the way in which qat is grown, and yes, how Yemen views its “flower of paradise.” This will require a committed investment in education and extension services.

For many Yemenis, to question qat use is to question the very nature of Yemeni society. Qat dictates the pattern of each day. Market patterns are uniquely sensitive to weekly fluctuations in its demand. Its use is ubiquitous; to abstain is to accept ostracization. In this manner, therefore, the increase in qat demand has been a boon to Yemen’s struggling agricultural system. Traditionally, while agriculture employs up to 60% of Yemen’s work force, it has yielded poor economic returns. The rise in demand for qat has increased these returns, raising the real wages of Yemen’s rural workers and lifting entire villages out of poverty.

Herein lies the central paradox of qat agriculture in Yemen. Its effects, while not without confounders (decreasing nutritional status of farmers, dangers of pesticide residue on crop), have undoubtedly increased food security and standard of living among the rural poor in the short term. Yet the strain placed on the Yemen’s groundwater for irrigating qat is clearly unsustainable. The difficulties of mediating qat use in a society already so enraptured by its charms are manifold. Despite this, the central argument of qat’s regulation in Yemen must be to insure that stability and security provided by qat in some sectors do not translate to instability and insecurity elsewhere. Failure to do so will irrevocably threaten Yemen’s collective livelihood.

For many rural families in Yemen, the situation is precarious. Commonly, these families live together in large patriarchal extended units. This fosters a sense of community and strong family connection typified by many Middle Eastern societies. Women and children are legally equal to men, although discrimination persists. Yemen’s childhood mortality rates are among the highest in the world, illustrating the unequal distribution of healthcare and access to education found in many of its regions. Infant and child mortality both hover around 15%, while the probability of a mother’s death during childbirth is about 1 in 10. These statistics are exacerbated in rural areas. While 20% of Yemen’s population is malnourished, fully 27% of people in rural areas are food insecure. Despite qat’s energizing economic effects, eight million rural Yemenis still reside in poverty. In Yemen, the average person receives 200 cubic meters of water per year. The international standard is a minimum of 1,000 cubic meters a year.

Traditional Yemenis continue to view the land as a source of identity, security, and life; its use is governed by the laws and customs dictated by Islam and the Quran. Land is seen as a communal interest. Only recently have private ventures upset this norm. Remnants of ancient agricultural terraces dot Yemen’s hillsides. For centuries the level sections between terraces have allowed for easy irrigation of mountainous terrain. Each growing season, terraces are indiscriminately flooded, providing ample irrigation of land. In the near past, these terraces were planted with sorghum, wheat, dates and grape, as well as other lesser crops. Now, however, there is a welcomed interloper- qat.

Qat was introduced to Yemen in the 1300's from Ethiopia. Originally, qat was the drug of kings. Now, due to increased social mobility, qat is truly a drug of the masses. In some areas of Yemen qat agriculture dominates. In the Wahdi Dahr basin, for example, qat accounts for 80% of the total planted acreage. The terrain of the mountainous highlands where qat thrives, however, is not conducive to large-scale plantings. For this reason, qat plots are clustered in numerous small farms throughout the region. Combined, these plots total 19,000 hectares of land. This area is increasing at 7 to 10% per year at the expense of other crops.

Qat behaves much like amphetamines in that it increases nervous system function. Accordingly, it reduces fatigue and appetite, lending to concern as its use as a food replacement in lower income households. Qat also causes numerous health issues such as gastrointestinal and oral inflammatory problems among its users. Most Yemenis have accepted its risks, but global perceptions vary. Two of qat's active substances - cathinone and cathine – are controlled in the US, while qat possession is illegal in many other countries. Elsewhere, qat is less regulated, allowing it ample opportunity to permeate society.

From the beginning, qat has inspired legend, its mythical status emblematic of the cultural phenomenon it would become. To date, fully 75% of Yemeni men and 33% of Yemeni women report at least minimal qat consumption. Demand is not income elastic. A household will purchase lesser quality qat if income falls instead of restricting its use altogether. Young or old, rural or urban, educated or not, qat use varies between 62-81% across nearly any stratum. No matter what the income, qat purchases account for 5-10% of the total expenditures in the majority of households. As average income levels have risen in recent years, demand for qat has risen as well. If qat's use does stray to the higher percentiles in larger households and among intellectuals, it is further testament to its powerful social impetus.

In Yemen, business flows according to qat's rhythm. Work is conducted with allowances for extensive "qat breaks" during the afternoon hours. During these periods "khateurs" spend hours in lethargic inactivity. Yet, it has come to be expected that qat use is an inevitable part of all business transactions. To abstain from qat is to largely abstain from Yemen's overriding social and business connection. It is worthwhile noting however, that this has not always been the case. Qat's pervading influence is relatively recent. In the last thirty years, qat chewing has replaced most other forms of relaxation (notably dancing) as the primary social activity. Thus, while factors of Yemeni society have certainly been conducive to qat's spread, Yemeni culture need not be defined by it. The strong emotional ties that connect Yemenite friends and family far surpass qat's influence. These effects are intransient; they are what truly define Yemeni society. Therefore, it is not cultural bigotry that advances the desire to regulate qat use; rather it is the hope that through regulation, Yemen will develop the means to sustain its unique cultural heritage while simultaneously increasing its own presence in the global community.

In summary, qat's effects reach far beyond those of a normal drug. Its use is intertwined in all aspects of a person's life. Using qat is not an individual decision. Accordingly, it must be understood in a social context.

Qat's detrimental effects on the environment are becoming increasingly pronounced. Most pressing is the strain qat places on Yemeni water tables. This strain is due in large part to the synergistic effect between qat and increases in irrigation. In the past, well drilling in Yemen was heavily subsidized, allowing wealthy private ventures to pump water far below the cost of extraction. Today, diesel fuel remains subsidized, so well expansion remains economical viably if not ultimately prudent. This allowed a boom in qat agriculture that in turn encouraged increased drilling. The area irrigated by wells has grown from 37,000 to 368,000 hectares in only 26 years. It is estimated that 30% of all irrigation water is used for qat. Qat production is highly subject to water availability. Therefore, farmers intensely irrigate to ensure high yield. Commonly used tube well irrigation is often mismanaged. As a result of these factors, water resources are declining at 3-6% per year. It is estimated that 30% of water used for irrigation could be

saved with the implementation of properly managed irrigation systems. Unless measures are taken to improve sustainably of Yemen's water supply, danger seems imminent.

Other factors attributed to qat threaten individual livelihoods as well. Qat displaces sorghum so less fodder is available to feed animals. Livestock rates invariably decline. With time, the nutritional profile of agricultural workers declines as well. Additionally, pesticides are often applied on a trial and error basis, resulting in measurable pesticide residues on qat bound for market.

For rural farmers, however, qat's economic benefits are perceived to outweigh its risks. And indeed, qat has contributed immensely to the 5% increase in agricultural revenues in the past few years. Nationally, qat sales contribute 2 billion dollars to gross domestic product (GDP). These gains are concentrated at the rural household level.

It has been repeatedly shown that for middle-eastern countries such as Yemen, an increase in the real-wages of working class people is the best measure to improve food security in this demographic. By all accounts, qat does exactly that. Among villages that produce qat, wages and access to capital are higher than those villages without significant qat agriculture. In addition, these villages have less migration to cities. In this manner qat limits burgeoning urbanization, while high urban demand for qat insures continual cash flow to impoverished areas. Qat's lucrative profit margins and relative ease of harvest have further advanced its standing as an agricultural crop of choice, although its benefits are not shared by all members of the community. Women do much of the planting, but the increased income is controlled by men. Women and children are the first to be affected by drops in nutritional standards. Decisive action must be taken to effectively regulate the uncontrolled spread of qat. Yet significant political, social, and economic roadblocks threaten progress.

Qat agriculture has been shown to raise real wages of Yemeni poor, but not other quality of life indicators such as nutrition and education. If production for qat were to be reduced, another high value crop must take its place, or risk infringing on Yemeni's fragile gains. Yet raising agricultural production (as well as maintaining the status quo) is complicated by ecological restraints. Nor is self sufficiency a viable solution if it forces families to forgo cash income. Furthermore, as urbanization in Yemen continues, water resources will increasingly be taxed for non-agricultural uses.

Reducing qat production, however, assumes that Yemen is ready to give up some of its dependence on qat. It is readily apparent that this is not the case. Strong-fisted measures to reduce qat consumption will fail utterly, as did a disastrous 1972 anti-qat propaganda campaign. This resistance can be paralleled to the United States' fight against widespread tobacco use. True reduction came not from outright prohibition, but rather from a facilitated shift in public perceptions. Educational initiatives and community-oriented support systems do more to encourage widespread change than any impossible-to-maintain governmental crackdown.

Unfortunately, this social ambivalence is mirrored within governmental policy. While the government no longer outwardly supports ill-advised irrigation well subsidies, it has done little else to inhibit qat's spread. This may be due in part – despite leadership's pleas for its cessation- to continued qat consumption in government workplaces. In fact, Yemen currently has no official qat policy, and excludes qat from national statistics and development programs. Its excuses for inactivity: taxation of qat is difficult due to its multivariable and short-lived supply chain, and that regulation due to these same factors is nearly impossible. This could be remedied by a simple recognition of qat in government policy.

From where then will a solution come? Faced with such a dizzying complexity of limitations one is hard pressed to come up with any one solution. The ludicrous "easy-fix" solutions that have been proposed (i.e. desalinating sea water and pumping it kilometers uphill) are as clearly unsustainable as the current situation. Yemen should not focus on a sole manner in which to stop qat's drain. A two part plan is the most viable solution. First, Yemenis must encourage sustainable agricultural practices. This will require a

gradual phase-out of government subsidized diesel for powering irrigation pumps. In conjunction with this, improved extension services should be well situated to encourage implementation of modern irrigation techniques. Once the benefits of such a system are realized, this should provide the impetus for continued investment in diversified research and development. Secondly, community-oriented programs can be instituted to reduce qat's sociological drain.

Non-governmental organizations (NGO) and community leaders are among the best equipped to institute local change. They may, however, require government support for funds and infrastructure. This collaboration in itself is a difficult proposition, but one that is necessary for Yemen's advancement. In addition Yemen's government will be required to undertake a gradual decrease in diesel subsidies. International support will be required, as Yemen will face pressure from other industries that also benefit from low diesel prices.

As the economic profitability of agriculture could be reduced due to the increased price of water, local communities must be trained in successful water management in order to regain income. Water sustainability is key, but not at the expense of a farmer's livelihood. A viable alternative to the common surface irrigation method is drip irrigation. Used in conjunction with traditional terrace agriculture, this system delivers water directly to a plant's roots, thus minimizing evaporation and runoff. Appropriate adoption and training in the use of these systems will significantly reduce irrigation water requirements. Still, in Yemen's fragile economy, serious monetary concerns could derail progress. It is hoped that within a community, a few landowners could be persuaded to implement modern techniques. Emboldened by their neighbors' successes, other members of the village would catch on. Grants from nonprofit organizations can also mitigate economic concerns by providing initial support and loans to small-scale producers. If time, it is possible that these programs could become self-sustaining. Checkoff programs, in which funds from the sale of a particular crop are collected and used to promote research for the crop, may be ideal. While taxation of qat has historically been difficult, producers may be more receptive to a program that allows them to see the direct results of their voluntary contributions. Areas of concern that need to be addressed by such a program include: appropriate scientific use of fertilizer and pesticides and identification of advantageous varieties or genes (GMO's).

These above measures should in no way detract from a need to reduce qat consumption in Yemen. Rather, they provide means to alleviate the current situation, and provide economic security for farm workers. Even if sustainable water management practices are implemented, continued increase in demand for qat will inevitably strain Yemen's water supply. Therefore, initiatives to reduce demand are paramount.

Here, community leaders can excel. A revival in traditional entertainment could help lessen Yemen's qat fixation. Educational initiatives can aid in teaching responsible household budget management and in drawing connections between men's increased expenditures and the decreasing health of his family. In this vein, NGOs should also look towards Yemen's women. The empowerment of women will have a dual effect in Yemen. Not only can women reassert their place in a society that so often devalues them stronger women also exert greater control over their families' finances. Because women use statistically much less qat than men and tend to be more concerned with the health and wellness of families, it is expected that qat demand will decrease.

Yemen is a country of incredible contrast and beauty, yet qat has become its fixation. Qat monopolizes existing agricultural land and water resources. This has left Yemen without the means to provide for a sustainable future. Through education and improved agricultural extension programs, Yemen can widen its focus beyond qat. Then it may move forward to actualize its full potential.

A solution must work within Yemen's unique parameters. First, Yemenis place strong cultural and social significance on qat. Because of this, educational initiatives must facilitate a shift in public perceptions of qat use. Changes must be gradual or they will risk resentment and public backlash. Reduction in demand

for qat must take place slowly and with careful attention to public sentiment. This may be cultivated through encouragement of equality and cultural values. Secondly, water supplies in Yemen are increasingly limited. Thus, every effort must be made to ensure irrigation is used in the most efficient way possible. Yemen's government should work in conjunction with private partners to provide access to sustainable irrigation techniques.

Yemen faces many challenge; the issues surrounding qat make up only a small portion of the total. Underneath all its complexities, however, the need to reduce qat's footprint seems to speak to a simple truth. Every member of society has the right to be afforded certain measures of long term security and happiness. For those who have come to depend on qat, we have the tools necessary to ensure just that. All that remains is to take action.

## Works Cited

- Al-Saqqaf, Raidan. "The Economy of Agriculture in Rural Yemen." *Yemen Times* 12 Aug. 2009. Web. 10 Aug 2010. <<http://yementimes.com/DefaultDET.aspx?i=1015&p=business&a=1>>.
- Culture of Yemen." *Countries and Their Cultures*. Web. <<http://www.everyculture.com/To-Z/Yemen.html>>.
- Lofgren, Hans, and Alan Richards. "Food Security, Poverty, and Economic Policy in the Middle East and North Africa." *Trade and Macroeconomics Division*. International Food Policy Research Institute, Feb. 2003. Web. 10 Aug 2010.
- Macleod, Hugh, and Jon Vidal. "Yemen Threatens to Chew Itself to Death Over Thirst for Narcotic Qat Plant." *Guardian News* 26 Feb. 2010: Web. 12 Sep 2010. <<http://www.guardian.co.uk/environment/2010/feb/26/yemen-qat-water-drought>>.
- Milanovic, Branko. "Qat Expenditures in Yemen and Djibouti: An Empirical Analysis." *MPRA*. 20 Jan 2007. Web. 21 Sep 2010. <<http://mpra.ub.uni-muenchen.de/1425/>>.
- Milich, Lenard, and Mohammed Al-Sabbry. "The "Rational Peasant" vs Sustainable Livelihoods: The Case of Qat in Yemen." *Development* Aug 28 2010: 1-11. Web. 1 Sep 2010. <<http://ag.arizona.edu/~lmiligch/yemen.html>>.
- "Qat Cultivation Threatening Water Resources, Specialists Warn ." *IRIN* (2007): Web. 21 Sep 2010. <<http://www.irinnews.org/Report.aspx?ReportId=75184>>.
- Ward , Christopher. "Building Block Qat." *Yemen: CDR*. Web. 12 Aug 2010. <<http://siteresources.worldbank.org/INTYEMEN/Overview/20150264/YE-Qat.pdf>>.