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The Evolution of *Khat* Practices and its Expansion: Insights from Northwest Ethiopia

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Abstract

Previous studies have limited evidence on Khat *practice in terms of consumption, production, and expansion in northwest Ethiopia. The objectives of this study were to explore the historical perspectives of Khat practice and examine determinants of expansion in the study areas. A sample of 402 households were taken to collect primary data. The study employed a discourse analysis, and the finding revealed that the origin and diversification of Khat in Ethiopia precedes coffee domestication. In the study areas, the average land size was 1.0 ha per household. In particular,* Khat *producer households had, in average, 0.23 ha of land. The majority (98%) of producer households introduced* Khat *since 1991. About 5.0% of household members and 8.0% of household-heads in* Khat *producing areas chew Khat. Nearly 56.0% of households perceived an increasing trend of* Khat *practice over space and time. The linear model results revealed that as total land size, education, religion being Muslim, income from* Khat *selling and household perception increases, the probability of* Khat *expansion also increases significantly and positively. Hence, further researches on its impact and policy formulation are required about regulation of* Khat *practice and consumption behaviors.*

Keywords: Expansion, discourse analysis, *Khat*, perception

Introduction

Khat (*Cata edulis*) is an evergreen flowering plant growing mainly for chewing and source of income for smallholders. Its leaves and young twinges are used for psychoactive alkaloid called cathinone (Al-Juhaishi *et al.,* 2012; Bedada *et al.,* 2018). Nearly 20

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million people chew *Khat* every day in the Arabian Peninsula and Eastern Africa (El-Menyar *et al.*, 2015). *Khat* has been considered as an illegal drug in most countries of Europe, Asia, and North America (Cochrane and O'Regan, 2016). On the other hand, it is legally permitted to sell and buy it in some other countries like the Netherlands (Colzato *et al.,* 2011). Several countries are increasingly banning it for its scale of production and consumption. Nevertheless, the habit of *Khat* chewing is evolving and spreading throughout the world (Yusuf, 2011). It has been chewed habitually in southwestern part of the Arabian headland and many other countries in the horn of Africa. One-third of the African countries practice[6] *Khat.* These are Sudan, Madagascar, Djibouti, Ethiopia, Somalia, Kenya, South Africa, Tanzania, Uganda, Eritrea, Burundi, Rwanda, Democratic Republic of Congo, Zambia, Zimbabwe, Zaire, and Malawi (Guesh, 2012; Asmamaw *et al.,* 2013; Ogada*et al.,* 2014). Among these, Ethiopia is the leading producer and fastest growing exporter of *Khat* followed by Kenya, Somalia, Yemen and Djibouti (Rahim et al., 2012; Worku et al., 2015; Cochrane and O'Regan, 2016).

Although *Khat* practice was started in eastern part of Ethiopia; it is growing in almost all parts of the country with an increasing trend spatially and temporally (Guesh, 2012; Beyene, 2024). Controversies have been observed on *Khat* production and consumption for decades. Nevertheless, it becomes everyday life among users in many parts of the country. According to some studies, *Khat* chewing has become highly prevalent in the country; thus chewing is one of the possible causes for growing controversies for public health problems (Demewoz and Yihunie, 2015). The chemical ingredients, compositions, and social aspects of *Khat* and its effects on health are well studied locally and internationally (Wabe, 2011; Alemayehu and Tewodros, 2014; Awel et al., 2016; Sabit *et al.*, 2020; Kabtamu *et al.*, 2025). In addition, retrospective studies have underscored about prevalence of *Khat* chewing by university and high school students. However, little is known and/or there is no pragmatic and conclusive evidence on *Khat* practice in the northwestern highlands of Ethiopia, in general, and study areas, in particular. A study was conducted on *Khat* expansion in the highlands of Ethiopia before two decades (Taye and Aune, 2003). However, recent empirical researches on *Khat* practice are limited. The rationale of this study was to explore determinants of *Khat* expansion, trends of consumption and production, and historical discourse. Therefore, this research was conducted in areas located alongside the main asphalt road that connects cities of Bahir Dar and Gondar. The specific objectives of this study were: (i) to explore the historical perspectives of *Khat* practice and, (ii) to examine determinants of *Khat* expansion in the highlands of Ethiopia particularly in northwest part of the country.

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6   Practice in this paper refers to chewing or consuming, planting, producing and selling or buying

Materials and methods

Area description

The study was conducted in four districts of northwest Ethiopia, located between Bahir Dar and Gondar cities namely *Dera, Fogera and Libo Kemkem* and *Gondar* Zuria district. The former three districts are found under South Gondar zone whereas Gondar Zuria district is situated in the southern direction of Gondar city in central Gondar zone (See Fig. 1.). The study districts were selected based on high production potential of *Khat* among other districts in the two zones.
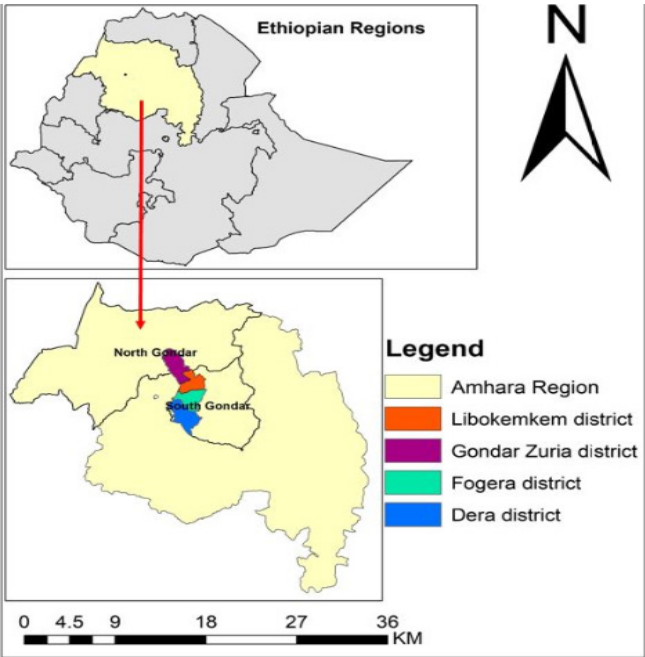

Fig.1: Map of the study areas

According to traditional agro-climate classification, the study districts are located in *Woina Dega* agro-ecology. Hurni *et al.* (2016, p.13), classified the altitude of *Woina Dega* between 1500 and 2300 meter above sea level. Rain-fed agriculture is the dominant production system supplemented by small-scale irrigation. The sizes of population and area coverage of the study districts are shown in Table 1.

Table 1: Size of population and area coverage of the study districts

Study districts	Population in number	Area (km.sq)	Density (pop/ sq.km)	Sources
Dera	310,438.0	1525.2	203.5	Dera Woreda, 2018
Fogera	326,203.0	1174.1	278.5	Asmiro & Girma, 2021; Melesse, 2022
Libo Kemkem	269,970.0	999.7	270.0	Walelign and Dagim, 2019
Gondar Zuria	264, 920.0	1108.5	239.0	Getachew, 2014

Source: Empirical literature

Gondar *Zuria* district is located 40 km south of Gondar city. In the district, there were 40 rural and two urban *Kebeles* (the lowest administrative unit). *Sereba, Densa Tikara, Tsion, Sebeda, Tinchaye, Sendeba, Sebeda Gebreal, and Debre Selam* were *Khat* producing *Kebeles* in Gondar *Zuria* district. Among others, *Sereba* and *Densa Tikara* were selected for this study. These two most producer *Kebeles* are located around *Infraz* town, at a distance of 20 km far from *Maksegnit* town. During the study period, *Infraz* and its surrounding were the center of *Khat* production and distribution.

Libo Kemkem is one of the 13 districts of South Gondar Zone. In the district, there were 31 rural and 3 urban *Kebeles*. The district has three rural towns; *Yifag, Anbomeda,* and *Mikael Debir. Wusha Tirs, Derita, Agela Mantogera, Ginaza, Yifag* and *Taragedam* were identified as *Khat* producer *Kebeles*, among which *Derita Agela* and *Mantogera* were selected.

Fogera is another district located 55 and 625 km north of Bahir Dar and Addis Ababa cities, respectively. It is found between *Libo Kemkem and Dera* districts. *Woreta* is the administrative town of *Fogera* district, which is located at an intersection point between two main asphalt roads connecting *Gondar-Addis Zemen-Woreta* and *Woldeya- Gayint-Debre Tabor-Woreta* to the main road of *Bahir Dar*. The typical farming systems were small-scale dairy-farm and rice followed by vegetables. The numbers of rural *Kebeles* in *Fogera* district were 33. *Woreta, Alember and Woji* are the three towns found in *Fogera*. In the district, ten *Kebeles* produce *Khat*, of which *Woreta Zuria* and *Woji* were selected for the study.

Dera is the study district located between *Fogera and Bahir Dar*. The district had 36 *Kebeles*, of which 28 of them produce *Khat*, and *Robit, Anbesame, Areb Gebeya, and Hamusit* are the only towns found in the district. The selected *Kebeles* for the study were *Qorata* and *Wonchet* that are located along the main asphalt road between *Woreta* and *Bahir Dar. Khat* cultivation mainly found at home gardens; producers call it 'የጓሮ ጫት' (Fig. 2). *Khat* producer districts were adjacent to and networked with the asphalt road. A number of small towns are established in each district along the main asphalt road placed apart about 25 km. About, eleven towns are found on and nearby to the road between

Gondar and *Bahir Dar* cities.

Fig. 2: *Khat* production in *Dera* district   Source: Photo taken during field survey

Sampling procedures and sampling size

A multi-stage sampling procedure was employed. In the first stage, *Khat* production belt was identified using preliminary assessments using personal observations and key informant interviews. In the second stage, *Khat* producer districts were purposively selected in the highlands of northwest Ethiopia alongside the main road between Bahir Dar and Gondar cities. The rationale for selecting the study districts was the emerging of *Khat* production potential. Among the districts of South Gondar zone where *Khat* is grown districts are *Dera, Fogera, and Libo Kemkem*. Similarly, farmers produce *Khat* in Gondar *Zuria* district in those aforementioned *Kebeles*.

In the third stage, stratification was made in each district between *Khat* producers and non-producers *Kebeles*. Among the identified *Khat* producer districts, *Dera* was the leading producer followed by *Fogera,* Gondar *Zuria* and *Libo Kemkem*. Finally, stratification was made for producer and non-producer households. The respondent household-heads were selected from the list of the sampling frame in each stratum. The total sample size was determined based on the Kothari (2004):

$$n_0 = \frac{Z^2 \, pq}{e^2}$$

Where n is the total sample size, Z is an area of the normal curve (confidence level), for the given confidence level, p is the proportion of population of *Khat* producer and q is the proportion of non-producer, and e is allowable error.

$$n = \frac{(1.96)^2 * (0.5) * (0.5)}{(0.05)^2} = 385$$

However, 5% of sample size was included so as to minimize the return rate of interview schedules. Thus, a total of 404 household heads were selected using systematic random sampling in probability proportional to size as shown in Table 2.

Table 2: Sample respondents drawn from the study districts of *Khat* producer *Kebeles*

Selected districts	Sample size		
	Khat producer	Non-producer	Total
Dera	77	27	104
Fogera	39	61	100
Libo Kemkem	31	69	100
Gondar Zuria	35	65	100
Total	182	222	404

Source: Sampling frame (each district agricultural offices)

The data were intended to be collected from a total of 404 households. Nevertheless, 178 producer and 207 non-producer households were participated in the interview.

Data collection instruments

Prior to data collection, the research team obtained a letter from the University of Gondar, College of Agriculture and Environmental Sciences, to address study subjects and concerned bodies to address ethical concerns. For ethical purposes, confidentiality was maintained from respondents and discussants during data presentation. The qualitative and quantitative data types were collected from primary and secondary data sources. Primary data sources include sampled respondent household heads, ten key informants, and researchers. Secondary data were collected from different literatures. Social and economic attributes of respondents, prevalence of chewing, and selling price of *Khat* leaves were quantitative data types collected from primary sources. Some quantitative data, for instance, yields and expansion of *Khat* productions were collected both from primary

and secondary sources. Hence, household survey, personal observation, key informant interview, and document review were the main data collection methods.

Different data collection instruments were used such as interview schedule for household survey, checklists for key informant interview and persona observation; camera for photo capturing, and geographic information system for study map imaging. In addition, researchers trained and recruited 16 enumerators and four supervisors for data collection. In the interim, pre-test was conducted for interview questions to check internal consistency and face-validity by eight household-heads who were not selected for survey.

Methods of data analysis

The data gathered from different sources were analyzed using descriptive statistics (frequency, percent, mean, maximum, and minimum), and discourse analysis for qualitative narrations like botanical and historical perspectives of *Khat* production particularly on controversies related to *its* practice and origin.

In order to analyze determinants of *Khat* expansion, linear regression model was employed. The dependent and explanatory variables were identified and hypothesized based on previous related empirical literature (Asmamaw *et al.,* 2013). The dependent variable was *Khat* expansion (KEXP) measured in ha. The explanatory variables are shown in Table 3. Linear regression model is equated as:

$$Y = \beta_0 + \beta_1 x + \varepsilon$$

Where, Y is the dependent variable, β_0 is an intercept, β_1 is slope, x is independent variable, and ε is the error term.

Table 3: Hypothesized variables

Variables acronym	Descriptions and measurement	Type	Hypothesis
	Dependent variable		
KEXP	*Khat* expansion (ha)	Continuous	
	Explanatory variables		
SEX	Sex of household head (male, female)	Dummy	+male
AGE	Age of household head, years	Continuous	-
MARR	Marriage (single, married, divorced, widowed)	Discrete	+single
EDUC	Educational status, years of schooling in grades	Discrete	+
RELIG	Religion (Orthodox, Muslim, others)	Discrete	+Muslim
HHS	Household size, number	Continuous	+
LAND	Total land size, ha	Continuous	+
LIVES	Livestock size, TLU	Continuous	-
INCOM	Income from *Khat* selling, birr	Continuous	+
PERC	Perception (agree, neutral, disagree)	Discrete	+
LOAN	Access to loan (yes, no)	Discrete	+
COOP	Cooperative membership (yes, no)	Discrete	+
MDIST	Market distance, walking minutes	Continuous	-
RDIST	Road distance, walking minutes	Continuous	-

Dummy and discrete variables were tested using contingency coefficient. Continuous variables were tested using variance inflation factor. There was no multicolinearity problem among explanatory variables as the values of contingency coefficient were below 0.75 and values of variance inflation factor were lower than 10.

Results and discussion

Socio-economic attributes of sample households

Data are collected from respondents in the study *Kebeles*. The key social and economic attributes of sampled households are shown below in Table 4.

Table 4: key attributes

Attributes	Units of measurement	Study districts				
		Dera	Fogera	Libo Kemkem	Gondar Zuria	Mean
Age	Years	40.7	43.2	48.2	50.6	45.5
Household size	Number	6.5	6.8	7.6	7.3	7.1
Land size	Ha	1.1	1.1	0.4	1.5	1.0
Khat grown	Ha	0.1	0.0	0.1	0.6	0.2
Livestock size	TLU	5.1	4.0	7.7	5.5	5.6
Price of *Khat*	Birr per gram	4.6	1.5	6.6	22.8	8.3
Market distance	Minutes	82.0	81.2	50.2	30.8	61.1
Road distance	Minutes	32.4	60.6	41.1	27.2	40.3

Source: Survey data

In the study areas, the sizes of female and male-head households were 8.2% and 91.8%, respectively. The age of household heads ranged from 19 to 82, on average 45.5 years. The majority of households were married and Orthodox followers (84.7% and 92%, respectively). About 41.3% of household-heads were unable to read and write while 38.2% were able to read and write. About 3.4% of household-heads had access to church education. The formal educational statuses of household heads were 5.5%, 3.6%, 2.6%, and 5.5% for elementary, junior, secondary and college levels. The size of household members was between 1 and 21, an average of 7.1 persons per household.

Farm households accessed to land sizes were between 0.06 and 4.0 ha, on average 1.0 ha while the numbers of plots were between 1.0 and 16.0, on average 4.5 plots per household. Landholding size for *Khat* production was 0.23 ha per household. In *Khat* producing *Kebeles*, 46.2% and 53.8% of households were producers and non-producers of *Khat,* respectively. Households rear animals and produce crops as well. Cattle, equines, sheep, goat, and poultry were the major types of livestock population while cereals, pulses, vegetables, oil crops, spices, and lupine were the major crops grown in the study areas. The major source of livelihood for farm households were livestock, crops, wage labor,

Khat, eucalyptus trees, fruits, and some non-farm/off-farm activities. Only about 4.9% of households were not engaged in livestock production activities. The average livestock holding was 5.6 TLU per household.

Households traveled from their residents to the nearest market and asphalt road on foot for an average of 40 minutes to one hour distance. Human mobility is one of the main mechanisms for source of information. Access to information is the major drivers of *Khat* for its spatial expansion, adaptation and adoption, and the households accessed information on *Khat* practice from different sources. Interviewed households replied that neighbors, nearby towns, individuals, and agricultural practitioners were the major source of information for *Khat* introduction to the study areas.

A lot of efforts have been made by the government of Ethiopia for the adoption of several technologies to improve agricultural production through extension services, but no satisfactory improvement on the livelihood of farming households (Cirera *et al.*, 2023). On the other hand, despite little or certainly no assistances, counseling, and training delivered to farmers by agricultural practitioners for the adaptation and adoption of *Khat* and eucalyptus trees, there has been tremendous expansion in rural areas.

Data collected from respondent households revealed that the major sources of information were their relatives and friends who reside in towns. They were accounted for 35.0% households, of which 79.0% of respondents were able to access information from Bahir Dar*, Zenzelima,* and *Robit* towns, where production, consumption and distribution of *Khat* took place. About 61.0% of households accessed information from neighbors, agricultural practitioners, and others in their *Kebele*. Some 4.0% of households could not remember where and when they accessed information about *Khat*. In the study *Kebeles*, on average, 8.0% of household-heads and 5.0% household members chew *Khat*. It implies that youths and adults not only in urban but also rural areas had grown and accustomed to chewing *Khat*.

Botanical narratives of Khat

Botanical descriptions of *Khat* such as nomenclature and plant taxonomy might give impetus for historical perspectives. *Khat* has different local names in different countries. Though several scholars studied on *Khat* plant, they did not elaborate regarding to its morphological and physiological aspects on whether the plant is shrub, vegetable or tree. Thus, this section is devoted to discuss specifically on native names and taxonomy of the *Khat* plant.

The *Khat* plant has different names in different countries, in this study some of the local names of the plant in countries like Ethiopia, Yemen, Somalia, Kenya, Uganda, Rwanda,,

and Saudi Arabia were identified. For instance, it is referred to as *chat* or *Khat* in Ethiopia; *Qat, kat, kath, gat, chat*, and *tschat* in Yemen (Anderson and Carrier, 2009; Ngari et al., 2019), *Jaad, kaad, chat* and *chad* in Somalia (Guesh, 2012; Ngari et al., 2019), *muguka* and *miraa* or *mirungi* in Kenya (Anderson and Carrier, 2009; Ngari et al., 2019), *marungi* in Uganda and Rwanda (Guesh, 2012), and *kat* in Saudi Arabia (Burton, 1956), *cat, ghat, tchat* (Al-Hebshi and Skaug, 2005), *chat* (Zerihun et al., 2019); *qat*, Bushman's tea (McCracken, 2012). Nevertheless, the common agreed name in many literatures is *Khat.*

Khat is classified under the kingdom of *Plantae*, class of *Magnoliopsida*, order of *Celartrales*, sub-order of *Rosidae*, family of *Celastraceae* genius of *Catha*, and species of *Cathaedulis* (Hassen *et al.*, 2007; Ngari *et al.*, 2019). It is also classified under a beverage vegetable (Burton, 1856; Klein *et al.*, 2009). Some others classified it as tree or shrub (Carrier, 2006). Chochran and O'Regan (2016) categorized the plant as a bush. First it was described as a cultivated green bush in 1237 (Ogada *et al.*, 2014). Hence, its classification is on the basis of functions and biomass. Regarding to biomass, if the plant grows 5 meter and above, it is said to be tree otherwise shrub (Christy, 2007). The possible reason of classification to be vegetable is its function where chewers use leaves and young twinges of the plant to chew on.

The age of *Khat* can last for more than two hundred years (Carrier, 2006). The first scientific description and classification of *Khat* was given by a Swedish botanist Peter Forskal in 1755 and 1768, respectively (Al-Hebshi and Skaug, *2005;* Ogada *et al.*, 2014; Ngari *et al.,* 2019).The plant is seedless and hardy, can grow in a variety of climates and soils. Overall, it is an evergreen flowering plant native to East Africa and Arabian Peninsula (Kalix, 1986; Cochrane and O'Regan, 2016; Ali *et al.*, 2017). There are various types of *Khat* species. About 40 types of *Khat* species are grown in Yemen (Zahran *et al.*, 2013). Indeed, species characterization of *Khat* is not yet studied in Ethiopia, and yet previous theoretical and empirical literatures could not clearly report the classification of *Khat*. There is a wide-ranging deviation of nomenclature and classification of the *Khat* plant whether it is vegetable, tree or bush. Therefore, it requires further evidence that foresters and horticulturalists shall deal with.

Historical perspectives of Khat

Origin and domestication of *Khat*: The origin of the *Khat* plant is inconclusive and not clearly demarcated (Kennedy, 1987, Dhaifalah and Santavy, 2004; Guesh, 2012). Nonetheless, Numan (2012) reported that *Khat* practice is originated in the Southern Red Sea (Yemen or Ethiopia). Some oral traditions also claim that *Khat* is originated from Yemen. Conversely, several literatures agreed that it is originated from south-western highlands of Ethiopia between 1st and 6th century (Zahran *et al.*, 2013; Ali *et al.*, 2017), specifically in the highlands of Hararghe with a gradual expansion to different parts of Ethiopia (Alemayehu and Tewodros, 2014). Awell *et al.* (2016) and Ali *et al.* (2017) revealed

that the origin of *Khat* is Ethiopia and spread to Arabian Peninsula, Eritrea, Somalia and Djibouti. Thus, many literatures argue that *Khat* is originated in Ethiopia (Minilk *et al.*, 2016; Awell *et al.*, 2016; Tembrock *et al.*, 2017; Gebrie *et al.*, 2018; Eyasu, 2018). Despite the domestication of *Khat* was started in early 6th century, scientific literatures on Khat appeared in the 1850s. Ibrahim Abu Zaharbui introduced *Khat* to Harar in 1430 and he introduced coffee into Arabia *(Burton, 1856).*On contrary, Dhaifalah and Santavy (2004)

reported that:

> Arab sources suggested that *Khat* was in Yemen in the 16th C, when Ethiopians conquered Yemen. Earliest reference to this plant appears to be dated around 973–1053 AD by Al-Biurni, who meticulously compiled information on all contemporary drugs, what he called qat that was imported from Turkistan.

However, apart from the sources mentioned above, other literatures (Alemu *et al.*, 2018; Zerihun *et al.*, 2019) documented that the origin of *Khat* is from Ethiopia. Arabic chroniclers noted that *Khat* was cultivated extensively in the mountains of Yemen and Harar of Ethiopia in the 14th century. It may have been introduced to Yemen from Ethiopia in the 6th century, some 600 years earlier than coffee (*Coffea arabica* L.), but was not known to the West until the end of the 18th century. Thus, Ethiopia is thought to be the center of origin of *Khat* that has long history of cultivation and consumption (Zerihun et al., 2019). *Aboday* in *Harerghe* is the center of diversity of *Khat* and grown elsewhere in the country (Alemayehu and Tewodros, 2014). In Yemen, the tree ranges from 1 to 10 metres (m) in height, while in Ethiopian highlands they can reach a height of 18 m (Al-Hebshi and Skaug, 2005). The *Khat* plant in Kenya reaches up to a height of 25 m (Ogada et al., 2014). It can grow in droughts where other crops have failed and at high altitudes (Alemayehu and Tewodros, 2014). The plant can also be harvested throughout the year.

Cultivation and trade: Even though *Khat* practice is appeared in many countries around Red Sea and Eastern Africa (Cox and Rampes, 2003), it is mainly grown in Ethiopia, Kenya, Yemen, Somalia, Sudan, South Africa and Madagascar. Yemen, Ethiopia and Kenya are the major *Khat* producer countries. It is also grown in several other eastern and southern African countries. UK, USA, Canada, Scandinavia, parts of Europe, Australia, and parts of India are countries that import *Khat* (Klein *et al.*, 2009). Previously, *Khat* leaves were available only near to where they were grown. The expansion of *Khat* was linked with the rational decision of producers and petty traders for business opportunities along with people's movement to Uganda and other African countries like Rwanda, and South Africa (Michael *et al.,* 2010). Hitherto, little efforts and less attention have been paid to the expansion of *Khat* cultivation in Ethiopia.

Trends of Khat practice

Ancient Greeks smoke *Khat* leaves and soldiers used it to prevent epidemics (Zahran *et al.*, 2013). The regular use of *Khat* is stimulation, confined largely to Muslim communities of southern Arabia and eastern Africa. In Ethiopia, *Khat* chewing has deep rooted history as

early as 14th century and is commonly used for social, religious and recreation purposes (Alemayehu and Tewodros, 2014). Until the 1960s and 1970s *Khat* consumption was confined to the region of production (Anderson *et al.*, 2007 cited in Klein and Metaal, 2010). Recently, improved roads and air transport have allowed a much wider distribution. The study areas of this research are also located along the main asphalt road, which helps to transport fresh leaves. As shown in Fig 3, it is a bundle of twigs, stems and leaves, wrapped in banana leaves or plastics to preserve freshness.

Fig. 3: Khat plant   Source: Authors

In the UK, *Khat* is chewed among diaspora communities from Eastern Africa and southern Arabia for pleasure and social interaction (Kassim *et al.,* 2015). In Ethiopia, *Khat* chewing is commonly practiced for socialization. Furthermore, it considered as a recreational substance (Alemayehu and Tewodros, 2014). *Khat* chewers classified the plant according to their preferences. Users prefer the *Khat* based on its morphological differences and implicitly its narcotic effects of the plant.

The habit of chewing *Khat* becomes pervasive in Ethiopia. The geographical coverage of *Khat* plantation is expanding from eastern to other parts of the country. It is the second largest export crop after coffee. The majority of chewers in some parts of Ethiopia were most educated and productive age youth groups (Alem *et al.*, 1999; Alemayehu and Tewodros,

2014). In Ethiopia, *Khat* cultivation was expanded by 160% from 2001/02 to 2014/15 (Chochrane and O'Regan, 2016). Nearly 3.1 million farmers produced 0.28 million tons of *Khat* on 249,358 ha of land with average productivity of 1.1 ton per ha (CSA, 2015). Its productivity ranges between 1.5 and 1.8 ton per ha in monoculture cropping around Haramaya town (Kandari *et al.*, 2014).

In *Amhara* region, 227,903 smallholders produced 6,657.2 tons of *Khat* on 9,562.8 ha of land. One of the zones in the region is South Gondar. More than 14,382 households produced *Khat* in the zone. However, the same evidence revealed that the number of producers in the central Gondar zone is not documented yet (CSA, 2015). *Khat* cultivation was started earlier than coffee cultivation in Ethiopia (EI-Menyar *et al.*, 2015). As to the authors' familiarity, *Khat* was introduced to the study areas within the last four decades. Among sampled households, only four (nearly 1%) were started *Khat* cultivation between 1980 and 1990. For ten consecutive years (from 1991 to 2002), 18.0% of households introduced *Khat* plant into their framing system. Among *Khat* producers, within two decades (from 2003 to 2020), 81.0% farm households domesticated the *Khat* plant. The average land holding of *Khat* producer is 0.23 ha per household. Almost 64.0% of households perceived that *Khat* plantation is increasing from time to time. In contrast, 5.6% of households disagree that *Khat* practice is declining in terms of area coverage. On the other hand, 32.0% of households argue that *Khat* cultivation has the same trend over years.

In *Dera* district, *Khat* production was extensively introduced in 1990. Currently, in the district 73.0% of households produced *Khat* on average 0.47 ha of land per household. The average productivity of *Khat* was 0.7 ton per ha. The unit price ranges from 50 to 300 ETB (Ethiopian currency) per 100 gm. Therefore, the current market price of *Khat* is 100 to 160 ETB per 100 gm for whole sellers and retailers, respectively. The price rises during dry seasons when demand increases. Households were using the land for crop production prior to *Khat* cultivation in the study areas (Fig. 4).This trend has adverse implications on food and nutrition security. Beyene (2024) has noted that "…for households that do not consume but do produce *Khat*, food insecurity might increase due to farmers' tendency to produce or substitute their land for *Khat* plantation."

Fig. 4: *Khat* plant in *Dera* district   Source: Own photo

In similar vein, urbanization in the vicinity of producer villages, favorable agro-climate conditions, infertile farmlands, free tax for *Khat* in local markets both in the producers and consumers' side, and high rate of youth unemployment were drivers for *Khat* expansion. Unemployed youth engaged in business and/or chewing *Khat.* The sources of money could be either borrowing from their families and colleagues or others. *Khat*-crop intercropping is another opportunity for the expansion of *Khat* cultivation in the study areas. The economic value of *Khat*, agro-ecological factors, and volatile price of other cash crops such as coffee were additional reasons for *Khat* expansion. For example, in Yemen, more than 97.0% of the *Khat* production of leaves is being consumed by 95.0% of Yemeni (Zahran *et al.,* 2013). It had impact on the economy of Yemen, which help them to export high quality of coffee seeds abroad. It has similar implication to Ethiopia.

Determinants of Khat Expansion

It is pertinent to find out factors that could influence expansion of *Khat* plantation in *Dera, Fogera, Libo Kemkem and Gondar Zuria* districts. Linear regression model was employed and the results are shown in Table 5.

Table 5: Key factors for *Khat* production expansion in the study districts

Explanatory variables and units	B	Std. Error	Beta	t	Sig.
Sex of household head (male, female)	0.022	0.037	0.028	0.601	0.548
Age of household head, years	-0.001	0.001	-0.067	-1.391	0.165
Marriage (single, married, divorced, widowed)	0.018	0.022	0.040	0.817	0.414
Educational status, years of schooling in grades	0.011	0.005	0.085	2.104	0.036
Religion (Orthodox, Muslim, others)	0.046	0.018	0.099	2.469	0.014
Household size, number	0.002	0.003	0.025	0.547	0.585
Total land size, ha	0.059	0.014	0.188	4.286	0.000
Livestock size, TLU	0.000	0.003	0.003	0.062	0.951
Income from *Khat* selling, birr	0.005	0.000	0.544	13.398	0.000
Perception (agree, neutral, disagree)	0.047	0.010	0.199	4.734	0.000
Access to loan (yes, no)	-0.120	0.062	-0.077	-1.932	0.054
Cooperative membership (yes, no)	0.034	0.019	0.074	1.772	0.077
Market distance, walking minutes	0.000	0.000	-0.002	-0.038	0.970
Road distance, walking minutes	0.000	0.000	-0.046	-0.839	0.402

Source: Linear regression model results

Land size, income and perception have influenced *Khat* expansion positively and significantly at 1% probability level. As total land size increases by 1 ha, the probability of *Khat* expansion also increases by 0.059. As a household-head perceive the rise of *Khat* plantation across periods, the possibility of production expansion increases by 0.047. According to Beyene (2024), land size and perceptions on area increment have positive correlations with *Khat* expansion. As income from *Khat* sales increases by 1.0 ETB, the likelihood of land expansion for *Khat* plantation also increases by 0.005. Educational status and religion also influenced *Khat* expansion positively and significantly at 5% probability level as shown in Table 5. As religion being Muslim and educational status increases by one years of schooling, the chance of plantation expansion increases by 0.046 and 0.011, respectively. It is because that Muslims tended to consume more *Khat* and engaged more in business activities compared to Orthodox followers. Besides, educated but unemployed youth practice *Khat* more than non-educated persons. These results are

agreed with the findings of Asmamaw *et al.*, 2013 and Kabtamu *et al.,* 2025.

Conclusions and Recommendations

This study tries to give a general view of the spatial and temporal dynamics of *Khat* in some selected *Kebeles* of northwest Ethiopia. In doing so, it also attempts to address a significant gap in the area. Cochrane and O'Regan, (2016) noted that though the

cultivation of *Khat* in sub-Saharan Africa date back to 17th C, its legal status and health impacts remained contested in the world. Despite this, the study identified the production and consumption of *Khat*, greatly increased in the study area ever since 1990s. The finding via linear regression analysis identified several factors positively associated with *Khat* expansion. Specially, the perceived profitability of *Khat,* household income, higher education level, affiliation to Muslim religion and total householding size emerged as key drivers of the expansion. It demonstrates a direct positive correlation. Consumption patterns showed that significant numbers youths and adults who produce the *Khat* are also get accustomed to chewing *Khat* which had been rare practice before.

Moreover, the study attests that the presence of *Khat* in Ethiopia predates coffee domestication by giving historical evidence from researches done by several authors in the area. Indeed, there were contradictory studies on the origin country of *Khat*, but the majority of studies incline to Ethiopia. Nevertheless, the study also disclosed that there is a limited understanding of *Khat* practice in the study area (northwest Ethiopia), and indicated the need for further investigation on social, economic and health implication of *Khat* practice in the region. Also, additional research and policy development are needed to address the regulation of *Khat* practice and consumption behaviors.

Based on the findings, here are some recommendations.

- The local and federal government should ensure youth employment opportunities via targeted initiatives.
- Policy makers are required to establish regulatory and binding rules for *Khat* practices.
- Improve the agricultural productivity by increasing farmlands fertility to smallholders' farmers in producing food and cash crops.
- Further studies are required on species characterization and ecological tradeoffs particularly soil-plant relationships.

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